

INDEX: IN TAXONOMIC ORDER

Numbers at left of species' names are positions in the taxonomic order. Letters added to right of some species' names indicate those species (or varieties) that are not verified in Kentucky due to uncertainty in records (R) or in taxonomy (T), plus those that may be verified but only as occasional escapes from cultivation (C) or as waifs (W) without established populations in the wild. See introductory text for full explanation of codes below each species for ALI (alien origin), HAB (details of habitats), and ABU (abundance versus rarity).

0001--*Huperzia lucidula* (Michx.) Trevisan

Lycopodiaceae: *Huperzia* [*Lycopodium*] *lucidula*

This ranges widely over northeastern North America, but it is generally restricted to moist acid soils in shady ravines. The disjunct record from JEFF is based on a coll. with somewhat dubious incomplete data, from "Mud Creek Swamp" ca. 1950s (DHL).

HAB 5 / A 1. ABU g8 s8 =.

0002--*Huperzia porophila* (Lloyd & Underwood) Holub

Lycopodiaceae: *Huperzia* [*Lycopodium*] *porophila*

This occurs mostly in the west-central Appalachians and Shawnee Hills, but with disjunctions elsewhere (FNA 2). In Ky. it usually grows in shade on rather dry rocky soils below sandstone cliffs. The sterile hybrid with *lucidula* (*X bartleyi*) is occasionally found in overlapping habitats (Cranfill 1980).

HAB 5,11 // A 1. ABU g8 s8 =.

0003--*Lycopodiella X copelandii* (Eig.) Cranfill

Lycopodiaceae: *Lycopodiella* [*Lycopodium*] *alopecurioides* x *appressum* (*X copelandii*)

Typical *alopecurioides* is a southeastern plant unknown in Ky. (though mapped here in FNA 2). The hybrid mapped here is known only from old gravel pits in CALL (KY), together with *appressa* and *appressa* x *prostrata*. These discoveries were made in the 1960s and 1970s (Cranfill 1980), but the pits have now become more thickly vegetated, and the clubmosses have largely disappeared.

HAB 9,6 :: A 4. ABU g8? s2? -4?

0004--*Lycopodiella X brucei* Cranfill

Lycopodiaceae: *Lycopodiella* [*Lycopodium*] *prostratum* x *appressum* (*X brucei*)

Typical *prostrata* is largely restricted to the southeastern Coastal Plain and unknown in Ky. See note under *X copelandii* (Eig.) Cranfill.

HAB 9,6 :: A 4. ABU g8? s2? -4?

0005--*Lycopodiella appressa* (Chapman) Cranfill

Lycopodiaceae: *Lycopodiella* [*Lycopodium*] *appressa* (*selago/inundata* var. a.)

This is widespread across southeastern and east-coastal states, but largely restricted to boggy soils in open areas, especially where disturbed by seepage, trampling, scraping or perhaps burning. The sites in CALL are artificially enhanced seeps associated with gravel quarries. The sites in eastern regions are along paths and rights-of-way. At least some of the plants in Ky. may be distinct from typical *appressa*, which is a more robust plant, according to J. Lasson (Athens Univ., Ohio, pers. comm.). Also, there can easily be confusion with *inundata*.

HAB 9,6 :: A 4. ABU g10 s2 -4?

0006--*Lycopodiella inundata* (L.) Holub

Lycopodiaceae: *Lycopodiella* [*Lycopodium*] *inundata* (var. i.)

The only record of this northern (circumboreal) species is from an old sandstone quarry floor on Pine Mt in HARL, first discovered by Ben Begley (Pine Mt. Settlement School). Colls. have been made by M. Evans (KSNPC) and JC (for KY). Hybrids with *appressa* may also be expected (W).

HAB 9 :: A 6. ABU g10 s2 -2?

0007--*Pseudolycopodiella caroliniana* (L.) Holub R

Lycopodiaceae: *Pseudolycopodiella* [*Lycopodium**] *caroliniana*

This was reported by FNA 2 from w. Ky. in the same general area as the *Lycopodiella* taxa noted above. However, colls. from Ky. or Tenn. are not documented. This species is widespread over the Southern Hemisphere and extends into North America on the Gulf and Atlantic Coastal Plain.

0008--*Diphasiastrum digitatum* (Dill. ex A. Braun) Holub

Lycopodiaceae: *Diphasiastrum* [*Lycopodium**] *digitatum* ("flabelliforme"; *complanatum* var. f.)

This is a widespread eastern species. Some colls. may need rechecking for *tristachyum* (Cranfill 1980), and rare hybrids with *tristachyum* (L. *X habereri* House) may be expected (FNA 2).

HAB 7,8,10 C 2. ABU g10 s10 -1?

0009--Diphasiastrum tristachyum (Pursh) Holub

Lycopodiaceae: Diphasiastrum [Lycopodium*] tristachyum

In Ky. this northeastern species is restricted to woods on dry infertile soils in Appalachian regions.

HAB 11,12 A 2. **ABU** g9? s8 -1.

0010--Lycopodium clavatum L.

Lycopodiaceae: Lycopodium clavatum

This is widespread over the globe but restricted to disjunct regions with cool climate. Within North America it occurs mostly in the transition from temperate to boreal regions.

HAB 7,8,10 :: A 3. **ABU** g10 s2 =?

0011--Dendrolycopodium obscurum (L.) A. Haines

Lycopodiaceae: Dendrolycopodium [Lycopodium*] obscurum (var.o.)

This mapping is provisional; see notes under hickeyi

HAB 7,11,5 A 3. **ABU** g10 s8 -2.

0012--Dendrolycopodium hickeyi (W.H. Wagner, Beitel & Moran) A. Haines

Lycopodiaceae: Dendrolycopodium [Lycopodium*] hickeyi (obscurum var. isophyllum)

Mapping is provisional and incomplete. This species was described in 1989, and there has not yet been a thorough separation of records from typical obscurum (FNA 2). Both hickeyi and obscurum have northeastern ranges, but hickeyi extends into colder zones may be generally uncommon to rare in southern Appalachian regions. D. hickeyi can be expected in less mesic habitats than obscurum, but the ecological difference is less than that between Diphasiastrum digitatum and tristachyum (J. Hickey, pers. comm.).

In other states, there has also been confusion between D. hickeyi and D. dendroideum (Michx.) A. Haines, which has a boreal range across North America and eastern Asia (FNA 2). D. dendroideum has been found at higher elevation in Tenn. (Ch) and may be expected in Ky.

HAB 11,10,12 A 4. **ABU** g9? s7? -1.

0013--Selaginella apoda (L.) Spring

Selaginellaceae: Selaginella <Lycopodioides> apoda (ssp. a.)

This is widespread on damp acid soils in eastern states, except the upper midwest. It is likely that the genus Lycopodioides will become used for this species (as reviewed by W), to be renamed L. apoda (L.) Kuntze.

HAB 6,7,5 B 3. **ABU** g10 s10 -3.

0014--Selaginella eclipses W.R. Buck

Selaginellaceae: Selaginella <Lycopodioides> eclipses (apoda ssp. e.)

This cryptic taxon is closely related to apoda, and combined or reduced to ssp. eclipses (W.R. Buck) Skoda in some treatments. It occurs mostly in regions around the Great Lakes, and is also scattered through the Ozark region (FNA 2, Y). Although recently collected from Habersham Co., Ga. (P. Hyatt #11533 at GA), it has generally not been recognized in southeastern states (W). In Ky. the only record is a coll. from Eastview Barrens in HARD (KY), identified by Cranfill (1980, 1991).

S. eclipses differs from apoda in its median leaves with long attenuate to bristled, veined and frequently recurved apices (versus acute to attenuate, usually keeled but with vein not extending almost to tip); lateral leaves tend to be smaller (ca. 1-2 x 0.5-1.3 mm versus 1.4-2.2 x 0.8-1.3 mm); its megaspores are usually larger, relatively shiny, and more coarsely reticulate (Buck 1977; Haines 2003). It is usually reported from calcareous substrates, where apoda is virtually absent.

HAB 10,12,7? D? 5? **ABU** g8? s2? -3?

0015--Selaginella rupestris (L.) Spring R

Selaginellaceae: Selaginella <Bryodesma> rupestris

This northeastern species extends south to outcrops in the southern Appalachians and Ozark Mts. It will probably become known as Bryodesma rupestre (L.) J. Sojak (W). Martindale (1876) reported a coll. by "Miss Rule" from Rockcastle Springs (LAUR), but this has not been located.

0016--Isoetes melanopoda Gay & Durieu ex Durieu

Isoetaceae: Isoetes melanopoda (?+ ssp. silvatica)

Typical melanopoda occurs mostly in midwestern regions from Iowa to e. Tex., usually in open grassy swales. Plants east of the Mississippi Rv. tend to be distinct (Brunton & Britton 2006): their leaves are >1.5 mm wide at midpoint (versus <1.1 mm), usually whitish to occasionally dull brown (versus shiny blackish); megaspores are >400 (380) micrometers (versus <380), usually with bold distinct ornamentation (versus plain obscure); and their habitat is usually wooded swamps.

The most distinct eastern plants, on the Coastal Plain and Piedmont from Miss. to N.J., have been named ssp. *silvatica* Brunton & D.M. Britt. Plants in Ky. have not been thoroughly reexamined, but some colls. from BULL (EKY, MM) and HARD (MM) appear at least transitional to *silvatica*.

HAB 6,9,2 ~ C 3. **ABU** g8 s4? -3.

0017--*Isoetes butleri* Engelm.

Isoetaceae: *Isoetes butleri*

This occurs mostly in the Ozark region and cedar glades of the Interior Low Plateaus. In Ky. there are only one or two well documented localities: in n. SIMP and s. WARR (Cranfill 1980; KSNPC database). It grows in depressions on limestone with saturated soil in spring, becoming dormant in May. More colls. are needed for herbaria.

HAB 12,10 ~ E 4. **ABU** g7 s2 -3.

0018--*Isoetes engelmannii* A. Braun

Isoetaceae: *Isoetes engelmannii*

This is widely scattered in Appalachian and Atlantic Coastal regions, but with disjunct localities west to the Ozarks. It usually grows in sandy streambeds and oxbows that can dry out in summer. Variation needs further study (W). Some material in Ky. may be at least transitional to the southern Appalachian *I. valida* (Engelm.) Clute (= *I. engelmannii* var. *caroliniana* A.A. Eat.). *I. valida* is a less robust plant with spores that are more spinulose; it is typical of more stagnant to oligotrophic waters (F, W).

Several related polyploids have been recently described in southeastern states, including *I. appalachiana* D.F. Brunton & D.M. Britton, which is a tetraploid derived from *engelmannii* and *valida* that may also be expected in Ky. (Brunton & Britton 1997; W). The three species of *Isoetes* currently known in Ky. are all distinct diploids ($2n = 22$).

HAB 1,4,6 ~ C 3. **ABU** g10 s7 -3.

0019--*Sceptridium dissectum* (Sprengel) Lyon var. *dissectum*

Ophioglossaceae: *Sceptridium* [*Botrychium**] *dissectum* var. *dissectum*

This highly dissected, bipinnate variant is relatively frequent within northern regions. It is much less common than var. *obliquum* in the Ohio Valley, and rare to absent on the southeastern Coastal Plain (W). Its taxonomic status has been uncertain, between distinct species and environmental form.

HAB 7 C 3. **ABU** g10 s8? -2.

0020--*Sceptridium dissectum* (Sprengel) Lyon var. *obliquum* (Muhl. ex Willd.) new comb.

Ophioglossaceae: *Sceptridium* [*Botrychium**] *dissectum* var. *obliquum*

This is a highly variable eastern species, as currently defined. Potential segregates need further study, but may be intergradient; $2n = 90$ in general (FNA 2; W). See notes under var. *dissectum*.

Some plants of *dissectum* in e. Ky. and Tenn. have relatively long, linear (parallel-sided), pinnules (especially lower ones); these have "somewhat blunt-tipped segments with a more or less whitish gray central line above the veins" (FNA 2). These plants were provisionally named *B. johnsonii* or *B. parallelum* by W.H. Wagner, but have not been formally described (Johnson 1960). They are known from ADAI, BOYD, FLOY, JOHN (with provisional type), PIKE and ROWA (M).

HAB 7,5,8 C 3. **ABU** g10 s10 -2.

0021--*Sceptridium biternatum* (Savigny) Lyon

Ophioglossaceae: *Sceptridium* [*Botrychium**] *biternatum* (*dissectum* var. *tenuifolium*)

This southeastern species is often mixed with *dissectum*, with no clear difference between typical habitats in Ky., though it is reportedly associated more with lowlands in general (F, Y, W). Although these two taxa are closely related, hybrids have not been reported (FNA 2, Y, W).

HAB 7,10,6,9? C 4? **ABU** g8? s8 -2.

0022--*Sceptridium oneidense* (Gilbert) Holub

Ophioglossaceae: *Sceptridium* [*Botrychium**] *oneidense* (*dissectum* var. *o.*)

This northeastern taxon may not be clearly distinct from *dissectum* (W. Hauk cited in W), and has been called "embarrassingly transitional" to the more northern (circumboreal) *multifidum* (F). In Ky. the only record is a coll. of M. Medley (for WKY) in 1978 from a grassy bald on the summit of Big Black Mt. (HARL). However, the site was later bulldozed (Cranfill 1980).

HAB 7,6 B 3? **ABU** g8? s2? -1?

0023--*Sceptridium jenmanii* (Underwood) Lyon R

Ophioglossaceae: *Sceptridium* [*Botrychium**] *jenmanii* (*alabamense*)

This southeastern species is a distinct polyploid; $2n = 180$ (versus 90 in other *Sceptridium* species of Ky.). It was mapped for Ky. in FNA 2, no verified colls. have been located. M reported a possible coll. of T.N. McCoy from

"Lakeview Church Road" in MARS at MUR in the 1980s, but that coll. now appears to be misplaced. The species is scattered across e. Tenn. (Ch).

0024--*Botrychium lanceolatum* (Gmel.) Angstr. var. *angustisegmentum* Pease & A. H. Moore

Ophioglossaceae: *Botrychium lanceolatum** var. *angustisegmentum*
The only record of this northern species is a coll. from KENT (KNK): P. Kelly, 6 Jun 1989, in woods along woodland hiking trail, adjacent to Kenton County Golf Course; on Banklick Station Rd. northwest of Independence.
HAB ? D? 3? **ABU** g9? s1 -1?

0025--*Botrychium matricariifolium* (A. Braun ex Dowell) A. Braun ex Koch

Ophioglossaceae: *Botrychium matricariifolium*
This northeastern species was discovered by M. Medley in thin woods with *Rhododendron maximum* at Bad Branch in LETC. It is also known in several adjacent counties of s. Ohio and w. Va. (PL). Across its range, *matricariaefolium* (2n = 180) occurs in a wide range of habitats, like *lanceolatum* (2n = 90) but perhaps concentrated on less fertile soils. These are the only Ky. species that are retained in *Botrychium*, sensu stricto, after the recent revision of Hauk et al. (2003). Another northern diploid may also be expected: *B. simplex* E. Hitchc. (PL).
HAB ? A? 3? **ABU** g10 s2 -1?

0026--*Botrypus virginianus* (L.) Holub

Ophioglossaceae: *Botrypus* [*Botrychium**] *virginianus*
This is widespread across much of the Americas and Eurasia. Hauk et al. (2003; see also W) have recently affirmed the validity of *Botrypus* as a genus; 2n = 184.
HAB 7,5,11 D? 2. **ABU** g10 s10 -2.

0027--*Ophioglossum engelmannii* Prantl

Ophioglossaceae: *Ophioglossum engelmannii*
This occurs from south-central states to Central America in dry, rocky open habitats on limestone or dolomite.
HAB 12 + E 4. **ABU** g8? s7? -3.

0028--*Ophioglossum pycnostichum* (Fern.) A.& D. Löve

Ophioglossaceae: *Ophioglossum pycnostichum* (*vulgatum** var. *pyc.*)

This is widespread in southeastern states, especially in somewhat disturbed wooded sites on seasonally damp soils.

HAB 7,5 :: C 3. **ABU** g10 s9 -2.

0029--*Ophioglossum pusillum* Raf. T

Ophioglossaceae: *Ophioglossum pusillum* (*vulgatum* var. *pseudopodium*)
This northern species is known from Ind., Ohio and Va., but extensions south to Ky. and N.C. remain rather uncertain (FNA 2, W). There is a coll. from FLEM (KY) that has been determined by H. Wagner, but its distinction from *pycnostichum* is not clear. In *pusillum*, sterile blades are elliptic (versus ovate, broadest below middle), pale dull green (versus dark shiny green, with firmer texture); basal frond sheaths are membranaceous and ephemeral (versus leathery and tending to persist); spores are 50-60 microns wide (versus 35-45 microns).

0030--*Equisetum hyemale* L. var. *affine* (Engelm.) A.A. Eat.

Equisetaceae: *Equisetum* <*Hippochaete*> *hyemale* var. *affine* (*robustum*)
This species is widespread in subtropical to cool temperate regions of the Northern Hemisphere. Var. *affine* applies to North American plants. Habitats are generally similar to *arvense*: especially sandy or gravelly shores and ditches that retain water supply through the summer. But, on average, *hyemale* may be associated with wetter and more open habitats.
HAB 1 C 5. **ABU** g10 s9 -2.

0031--*Equisetum X ferrissii* Clute (pro sp.)

Equisetaceae: *Equisetum* <*Hippochaete*> *X ferrissii* (*hyemale* x *laevigatum*, *hyemale* var. *intermedium*)
See M and Abbott et al. (2001) for detailed notes. *E. laevigatum* A. Braun (= *E. kansanum* J.H. Schaffn.) is a western species that has been reported from Ky., but no colls. are confirmed (M). The hybrid with *hyemale* (*X ferrissii*) is more widespread than pure *laevigatum* in North America, and probably confused in many cases (FNA 2). The related northern (circumboreal) species, *E. variegatum* Schleich. (or its hybrid with *E. laevigatum*), has also been reported from Ky. but probably in error (M).
HAB 1 C 3. **ABU** g10 s4? -1?

0032--*Equisetum arvense* L.

Equisetaceae: *Equisetum arvense*
This is widespread in mid-temperate to arctic regions across the Northern Hemisphere. Within Ky. it becomes less frequent to the southwest, and further

south it is largely absent on the southeastern Coastal Plain (PL, W). Several segregates have been named but these have not been recognized in recent treatments (FNA 2; W). The hybrid with *hyemale* has been reported from Ky. (M), but the cited coll. from JEFF (DHL) is only vegetative and not clearly distinct. *E. sylvaticum* L. and *E. pratense* Ehrh. are related northern (circumboreal) species that have also been reported, but probably in error (M).
HAB 1,4 C 4. **ABU** g10 s10 -2.

0033--*Osmunda regalis* L. var. *spectabilis* (Willd.) Gray

Osmundaceae: *Osmunda regalis* var. *spectabilis*
This widespread eastern taxon is closely related to plants in E. Asia (especially) and Europe (FNA 2; W).
HAB 4,6 B 3. **ABU** g10 s10 -3.

0034--*Osmunda claytoniana* L.

Osmundaceae: *Osmunda claytoniana*
This is a widespread northeastern species.
HAB 7,11 B 3. **ABU** g10 s9 -2.

0035--*Osmundastrum cinnamomeum* (L.) C. Presl

Osmundaceae: *Osmundastrum* [*Osmunda**] *cinnamomeum*
This species is widespread in eastern North America, Central and South America; and a distinct variety occurs in East Asia. Recent molecular research has supported the generic assignment (as reviewed by W).
HAB 6 B 3. **ABU** g10 s10 -3.

0036--*Trichomanes boschianum* Sturm

Hymenophyllaceae: *Trichomanes boschianum*
This occurs in the Southern Appalachians, Appalachian Plateaus and Shawnee Hills, plus disjunctions in the Ozarks and Chihuahua (Mexico). It is restricted to damp recessed walls of non-calcareous cliffs, especially sandstone. There are diploids ($2n = 72$), tetraploids and occasional sterile triploids. Diploids are prevalent in western regions, but they have not been distinguished with morphological characters (FNA 2).
HAB 5 // A 1. **ABU** g8 s7 =.

0037--*Trichomanes intricatum* Farrar

Hymenophyllaceae: *Trichomanes intricatum* [gametophyte]
This species is known only from its filamentous gametophytes; see W for review. It is known only from ceilings or back walls of overhanging cliffs in

Appalachian regions and the Shawnee Hills. Records of Cranfill (1980) and Farrar (1992) are mapped here but need better documentation. A distinct, thallose gametophyte expected in Ky. is *Hymenophyllum tayloriae* Farrar & Raine, a southern Appalachian species that occurs on the Cumberland Plateau in Tenn. close to Ky. (Ch, W).
HAB 5 // A 1. **ABU** g8 s7 =.

0038--*Lygodium palmatum* (Bernh.) Sw.

Lygodiaceae [Schizaeaceae]: *Lygodium palmatum*
This largely Appalachian species is locally abundant on damp, seeping sites of the Cumberland Plateau in Ky. and Tenn. Within Ky. the only known extensions west of the Appalachians are some occurrences among adjacent Knobs, and the remarkable disjunct patch in HARD, discovered by Cranfill (1991). There appear to be two variants in this species, which deserve further investigation (Garrison 1992; W).
HAB 9,6 A 3. **ABU** g8 s8 -2.

0039--*Marsilea quadrifolia* L.

Marsileaceae: *Marsilea quadrifolia*
This alien has been widely distributed for "water gardens" and it has locally escaped in northeastern states, usually in artificial ponds (FNA 2, W). Several other alien or adventive species in this genus may be expected.
ALI EU. **HAB** 2 ~ D? 6. **ABU** +4.

0040--*Azolla caroliniana* Willd.

Azollaceae [Salviniaceae]: *Azolla caroliniana*
This extraordinary aquatic fern (plus its symbiotic, nitrogen-fixing, blue-green alga) is widely scattered over southeastern states, but generally restricted to old, stable, stagnant water-bodies with moderately eutrophic conditions.

The closely related western species, *A. mexicana* Presl., is known in adjacent Mo. (FNA 2; Y), and is expected in far western counties of Ky. It differs from *caroliniana* in the larger size of its fronds (ca. 10-15 mm wide versus 5-10 mm), and in its glochidia (appendages of microspore packets) with several cross-walls (versus none).
HAB 2 ~ D 6. **ABU** g9? s7? -2.

0041--*Vittaria appalachiana* Farrar & Mickel

Pteridaceae [Polypodiaceae]: *Vittaria appalachiana* [gametophyte]

This is restricted to recessed walls of non-calcareous cliffs, mostly in Appalachian regions. It is known only from its thalloid gametophytes, and was known informally as the "Appalachian Gametophyte" until described by Farrar & Mickel (1991); see W for review. The only known plants west of Appalachian regions are along sandstone cliffs of the Shawnee Hills in Ky.
HAB 5 // A 1. **ABU** g8? s8? =.

0042--Adiantum capillus-veneris L.

Pteridaceae [Polypodiaceae]: *Adiantum capillus-veneris*
Within Ky., this southern (pantropical) species of sunny, seeping, calcareous outcrops is concentrated in the central Cumberland Rv. and Green Rv. systems. It has not been rediscovered at some localities with older colls: from POWE at "Natural Bridge" (MUR: T.N. McCoy, 6 Dec 1959); from CART (1899; "Carter Caves") and WHIT (1883; "cavernous cliffs, Cumberland Falls"), both mounted on one sheet at GH (A. Risk, pers. comm.). The location in WHIT may be doubted; downstream, PULA has the largest cluster of records in the state. The record from NELS is also old and possibly from adventive plants; details need checking (Cranfill 1980).

HAB 5 ~| E 4. **ABU** g10 s4 =.

0043--Adiantum pedatum L.

Pteridaceae [Polypodiaceae]: *Adiantum pedatum*
This is widespread in mesic woods of eastern states, except on the Coastal Plain.

HAB 5 D 1. **ABU** g10 s10 -2.

0044--Pellaea atropurpurea (L.) Link

Pteridaceae [Polypodiaceae]: *Pellaea atropurpurea*
This is widespread across eastern and central states, plus Mexico to Guatemala.

HAB 11,12 +\ E 3. **ABU** g10 s10 -2.

0045--Pellaea glabella Mett. ex Kuhn

Pteridaceae [Polypodiaceae]: *Pellaea glabella*
Distinction of this northeastern tetraploid ($2n = 116$) from the much more common *atropurpurea*, a triploid ($2n = 87$), can be difficult (Cranfill 1980; FNA 2; Y). *P. glabella* is widely scattered in Ky. but only locally frequent: along the Palisades of Ky. Rv. and on dolomite cliffs around the Bluegrass, especially in BULL and NELS.

Compared to *atropurpurea*, *glabella* has petioles and rachises glabrous or thinly hairy (versus densely hairy on upper surface). Its leaves are 1-2 times compound (versus 1-3), with terminal pinnae sessile (versus often stalked), monomorphic (versus somewhat dimorphic, the fertile ones with narrower pinnae), and gray-green (versus bright green). Both species are generally apomictic, but the diploid phase of *glabella* is known in Mo.

HAB 11,12 +/ E 4. **ABU** g10 s7 =.

0046--Argyrochosma dealbata (Pursh) Windham

Pteridaceae [Polypodiaceae]: *Argyrochosma* [Notholaena] *dealbata*
This largely Ozarkian species was collected in ADAI (Fi) during 1971 by D. Gibson & Watson: #722, from "exposed limestone rocks along Buffalo Cliff above Green River 8 miles N of Columbia." The area was searched unsuccessfully in 1991 by R. Cranfill, M. Medley and J. Campbell.

HAB 12 +\ E 3. **ABU** g9? s0 -6?

0047--Cheilanthes alabamensis (Buckl.) Kunze

Pteridaceae [Polypodiaceae]: *Cheilanthes alabamensis* (Pellaea a.)
This occurs on calcareous rocks across southern states and northern Mexico. In Ky. it is known only from cliffs along the Red Rv. in LOGA: M. Medley [& R. Cranfill] #1305-79. Chromosome number in this species and its close allies, together with other characters, suggest some affinity with *Pellaea*, but generic assignments remain uncertain (Cranfill 1980, FNA 2, W). In the U.S.A., plants are apogamous triploids ($2n = 87$).

HAB 12,11 +\ E 3. **ABU** g9? s2 -2?

0048--Cheilanthes lanosa (Michx.) D.C. Eat.

Pteridaceae [Polypodiaceae]: *Cheilanthes lanosa*
This diploid ($2n = 60$) occurs in rocky woods and glades across southeastern states.

HAB 12,11 +\ C 3. **ABU** g9? s8 -1.

0049--Cheilanthes feei T. Moore

Pteridaceae [Polypodiaceae]: *Cheilanthes feei*
This western, apogamous triploid ($2n = 90$) is virtually unknown east of the Mississippi Rv. (FNA 2). It was discovered at one site on dolomitic limestone cliffs along Cedar Creek in BULL (KNK) during the 1970s (Cranfill 1980) and 1980s (M), and it may have been relocated in 1993 by KSNPC staff.

HAB 12,11 +\ E 3. **ABU** g10 s1 -6?

0050--Dennstaedtia punctilobula (Michx.) T. Moore

Dennstaedtiaceae [Polypodiaceae]: *Dennstaedtia punctilobula*
This northeastern to Appalachian species has western disjunctions in the Shawnee Hills, and elsewhere outside of Ky. (FNA 2).

HAB 11,7 B 3. **ABU** g10 s8 -1.

0051--Pteridium aquilinum (L.) Kuhn var. latiusculum (Desv.)

Underwood ex Heller

Dennstaedtiaceae [Polypodiaceae]: *Pteridium aquilinum* var. *latiusculum*
This species has a widespread (cosmopolitan) range over the globe, in temperate and subtropical regions. Var. *latiusculum* occurs mostly in eastern North America.

HAB 10,11,7 B 4. **ABU** g10 s10 -3.

0052--Pteridium aquilinum (L.) Kuhn var. pseudocaudatum (Clute) Heller

Dennstaedtiaceae [Polypodiaceae]: *Pteridium aquilinum* var. *pseudocaudatum*
This distinct taxon may deserve at least subspecies status. It is most common on the southeastern Coastal Plain, especially in dry sandy woodlands (FNA 2; W). It differs from var. *latiuscula* in the more elongated terminal segments of well-developed pinnules (with l/w ca. 6-15 versus 2-4), especially the tips of basal-most pinnules of basal pinnae (which average 25% versus 12% of the whole pinna length). Also, it has glabrous to sparsely pilose leaf margins, lower rachis and costae surfaces (versus more or less shaggy pubescent).

HAB 10,11,7 B 4. **ABU** g9? s8? -3.

0053--Asplenium rhizophyllum L.

Aspleniaceae [Polypodiaceae]: *Asplenium* <Camptosorus> *rhizophyllum*
This diploid (2n = 72) is widespread in eastern North America on base-rich rocks, except on the southeastern Coastal Plain.

HAB 5 \ D 1. **ABU** g10 s10 -1.

0054--Asplenium pinnatifidum Nutt.

Aspleniaceae [Polypodiaceae]: *Asplenium pinnatifidum*
This is largely restricted to non-calcareous cliffs in the Appalachians, Shawnee Hills and Ozarks. It is a polyploid (2n = 144) derived from *montanum* and *rhizophyllum*. Hybrids with *montanum*, *platyneuron* and other species are occasionally found, and locally frequent in some cases.

HAB 11,5 || A 2. **ABU** g9 s9 =.

0055--Asplenium X trudellii Wherry (pro sp.)

Aspleniaceae [Polypodiaceae]: *Asplenium pinnatifidum* x *montanum* (X *trudellii*)

These plants of hybrid origin are relatively frequent with the parents.

HAB 5,11 || A 2. **ABU** g9 s9 =.

0056--Asplenium X kentuckiense T.N. McCoy (pro sp.) R

Aspleniaceae [Polypodiaceae]: *Asplenium pinnatifidum* x *platyneuron* (X *kentuckiense*)

The type of this taxon is from CALL (UC), but plants could not be refound at that locality by Cranfill and others. Cranfill (1980) reported colls. from BOYD, JOHN, POWE (at KY) and ROWA, but these have not been seen.

0057--Asplenium montanum Willd.

Aspleniaceae [Polypodiaceae]: *Asplenium montanum*
This diploid (2n = 72) is largely Appalachian, and restricted to siliceous cliffs. See notes under *bradleyi*, *pinnatifidum* and X *trudellii*, which have hybrid origin.

HAB 5,11 || A 2. **ABU** g9 s9 =.

0058--Asplenium bradleyi D.C. Eat.

Aspleniaceae [Polypodiaceae]: *Asplenium bradleyi*
This occurs on non-calcareous rocks in the Appalachians, Shawnee Hills and, especially, the Ozarks. It is largely tetraploid (2n = 144), derived from *platyneuron* and *montanum* (FNA 2). Hybrids of *bradleyi* with *montanum* (X *wherryi* Maxon) and *pinnatifidum* (X *gravesii* Maxon) are occasionally found in Ky. (Cranfill 1980; colls. at KY, Morehead, etc.). In some localities these hybrids are known but pure *bradleyi* has not yet been verified (MCRE, MORG, POWE).

HAB 11 || B 2. **ABU** g8 s8 =.

0059--Asplenium platyneuron (L.) B.S.P.

Aspleniaceae [Polypodiaceae]: *Asplenium platyneuron*
This diploid (2n = 72) is widespread in eastern states. Variation deserves further research. Unusually large, deeply pinnatifid plants have been called var. *bacculum-rubrum* (Featherman) Fern. Such plants have been collected in BREC (KY), FAYE (KY) and PIKE (Carnegie Museum). That variant has not been generally recognized in recent treatments (e.g. FNA 2), but it can be maintained in gardens (Cranfill 1980). A few colls. are referable to forma *hortonae* and forma *serratum* (following F). Hybrids with *rhizophyllum* (X

ebenoides R.R. Scott) have been found in several counties (Cranfill 1980; colls. at KY etc.).

HAB 7,5,11 C 3. **ABU** g10 s10 -2.

0060--Asplenium platyneuron (L.) B.S.P. var. bacculum-rubrum (Featherman) Fern.

Aspleniaceae [Polypodiaceae]: *Asplenium platyneuron* var. *bacculum-rubrum*

HAB 7 C 3. **ABU** g8? s5? -2.

0061--Asplenium resiliens Kunze

Aspleniaceae [Polypodiaceae]: *Asplenium resiliens*

This apogamous triploid ($2n = 108$) is widely scattered on base-rich rocks from southern states to South America. The coll. from HARL (EKY) is from sandstone.

HAB 5,11 || E 2. **ABU** g8 s8 =.

0062--Asplenium trichomanes L.

Aspleniaceae [Polypodiaceae]: *Asplenium trichomanes*

Variation needs further research. This species is widely distributed on outcrops in North America and other parts of the world. In Ky. it is generally occurs on sandstone cliffs, but it is also scattered on limestone along the Kentucky River Palisades (FAYE, GARR, MERC).

It is likely that the Palisades plants are ssp. *quadrivalens* D.E. Meyer, which is distinguished by its larger spores (37-43 versus 27-32 micrometers) and higher chromosome number ($2n = 144$ versus 72). That taxon is known only on calcareous rocks, mostly in northeastern regions, but with a few disjunct occurrences further west (FNA 2).

HAB 5 // C 2. **ABU** g10 s9 =.

0063--Asplenium ruta-muraria L.

Aspleniaceae [Polypodiaceae]: *Asplenium ruta-muraria*

Variation needs further research. North American plants are tetraploid ($2n = 144$) and generally known as var. *cryptolepis* (Fern.) Wherry, which is largely restricted to calcareous cliffs in eastern regions. Plants with more acute leaf segments may be named var. *lanceolum* Christ (= *A. cryptolepis* Fern. var. *ohionis* Fern.), but their taxonomic status has been doubted (Cranfill 1980; FNA 2). Such plants are known from BULL (DHL), CART (KY) and JEFF (DHL).

Atypical plants from MCRE (MM for WKY), on the ridge at the mouth of Little South Fork, have unusual filiform pinnules, and may deserve taxonomic attention (M). Note that hybrids of *ruta-muraria* with *rhizophyllum* or other species are "exceedingly rare" in North America (FNA 2).

HAB 11,12,5 || E 3. **ABU** g8 s8 =.

0064--Woodwardia areolata (L.) T. Moore

Blechnaceae [Polypodiaceae]: *Woodwardia* <*Lorinseria*> *areolata*

This is widely scattered in eastern states, but restricted to wet acid soils.

HAB 6 A 2. **ABU** g9 s8 -3.

0065--Woodwardia virginica (L.) Sm. R

Blechnaceae [Polypodiaceae]: *Woodwardia* <*Anchistea*> *virginica*

This occurs mostly in coastal regions from Mich. to Nova Scotia to Tex., and it is rare to absent in the midwest. It extends in the interior to the Cumberland Plateau of Tenn. (PL, Ch). The only record from Ky. is a coll. was reported by R. Cranfill (pers. comm.) from CLIN, at a swamp southwest of Albany, ca. 1996 (stored at Univ. of California, Berkley). It may be overlooked when sterile because of similarity to *Osmundastrum cinnamomeum*.

HAB 9 A 4. **ABU** g9 s2 -2?

0066--Onoclea sensibilis L.

Onocleaceae [Polypodiaceae]: *Onoclea sensibilis*

This monotypic genus is widespread in eastern North America; a distinct variety occurs in East Asia.

HAB 6,4,9 C 3. **ABU** g10 s10 -3.

0067--Diplazium pycnocarpon (Spreng.) Broun

Woodsiaceae [Polypodiaceae]: *Diplazium* [*Athyrium*] *pycnocarpon*

This is widely scattered in eastern North America, but generally restricted to mesic woods on base-rich soils.

HAB 5 E 1. **ABU** g10 s10 -2.

0068--Deparia acrostichoides (Sw.) M. Kato

Woodsiaceae [Polypodiaceae]: *Deparia* [*Athyrium*] *acrostichoides* (A. *thelypteroides*)

This is widely scattered over eastern states, except on the Coastal Plain. It generally occurs in mesic woods on medium acid, non-calcareous soils.

Within the Bluegrass region, the only record is a 1955 coll. M. Wharton from

"mesophytic woods" in ANDE (EKY), without locality but probably in the Eden Shale hills.

HAB 5 C 2. **ABU** g10 s10 -2.

0069--*Athyrium asplenoides* (Michx.) A.A. Eat.

Woodsiaceae [Polypodiaceae]: *Athyrium asplenoides* (felix-femina ssp. a.*) This widespread southeastern species generally occurs in woods with damp medium-acid soils, especially on seeping slopes and terraces. *A. angustum* (Willd.) K. Presl. is a closely related northeastern member of the felix-femina complex, with more robust, elliptic (versus subdeltooid) fronds, more glandular rachises and more dark-scaly stipes. It is reported adjacent to Ky. from Va. to Ohio to Mo. (PL), but not clearly present in Ky. (Cranfill 1980; FNA 2; W). A few plants in Appalachian regions are referable to forma *subtripinnatum* (following F).

HAB 5,7 C 2. **ABU** g10 s10 -2.

0070--*Woodsia obtusa* (Spreng.) Torr.

Woodsiaceae [Polypodiaceae]: *Woodsia obtusa* This is widespread in east-central states but generally restricted to rocky woods, especially on calcareous outcrops.

HAB 11,5 + D 3. **ABU** g10 s10 -1.

0071--*Woodsia appalachiana* T.M.C. Taylor

Woodsiaceae [Polypodiaceae]: *Woodsia appalachiana* (scopolina ssp. a.*) This is largely restricted to higher elevations in the Appalachian mountains, with an outlying population in Ark. It is closely related to the widespread western species, *W. scopulina* D.C. Eaton, which is often combined as a variety or subspecies (FNA 2). The only Ky. record is from Pine Mountain in BELL (Cranfill 1980); however, that coll. (Medley & Cranfill #359-78) was not accessed at KY or DHL. *W. appalachiana* has also been found on Pine Mountain in Va. close to PIKE (M).

HAB 11,5 +? A 4. **ABU** g6? s2 =.

0072--*Cystopteris bulbifera* (L.) Bernh.

Woodsiaceae [Polypodiaceae]: *Cystopteris bulbifera* This diploid (2n = 84) is widely scattered in eastern and central North America, but largely restricted to calcareous cliff-bases.

HAB 5 /+ D 2. **ABU** g10 s9 -1.

0073--*Cystopteris tennesseensis* Shaver

Woodsiaceae [Polypodiaceae]: *Cystopteris tennesseensis* (fragilis var. t.) This taxon is a fertile tetraploid (2n = 168) derived from crossing of *bulbifera* and *protrusa* (Haufler et al. 1990; FNA 2). Several records mapped here remain uncertain. Although most authorities consider treat these plants as a species, there is considerable variation, perhaps reflecting different original hybridizations (see also: Cranfill 1980; Cr, W). Some Ky. plants appear relatively close to *protrusa*, while other appear closer to *bulbifera*. Also, *tennesseensis* can form occasional hybrids with its parent species and with *tenuis*.

HAB 5,11 /+ D 2. **ABU** g8 s7 =.

0074--*Cystopteris protrusa* (Weatherby) Blasdell

Woodsiaceae [Polypodiaceae]: *Cystopteris protrusa* (fragilis var. p.) This rhizomatous diploid (2n = 84) is widespread in woods on mesic fertile soils in east-central states. Occasional sterile triploids may be expected, especially in hybrids with other species (FNA 2).

HAB 7,5 D 2. **ABU** g10 s10 -3.

0075--*Cystopteris tenuis* (Michx.) Desv.

Woodsiaceae [Polypodiaceae]: *Cystopteris tenuis* (fragilis var. mackayi) Several records of this northeastern species are uncertain, or may be hybrids; there has also been confusion with *tennesseensis*. *C. tenuis* is a fertile tetraploid (2n = 168) derived from crossing of *protrusa* and another parent, unknown and presumed extinct (Paler & Barrington 1995). It is similar to *protrusa* but differs in its shorter rhizomes (up to 0.5 cm versus 1-6 cm), which lack hairs (versus covered in hairs); its dark brown petioles (versus darkened only at base); its thicker leaves (versus membranaceous), with basal pinnules just slightly stalked to cuneate (versus clearly stalked) and just slightly lobed (versus deeply).

HAB 5 /+ C 2. **ABU** g9 s5? =.

0076--*Cystopteris fragilis* (L.) Bernh. R

Woodsiaceae [Polypodiaceae]: *Cystopteris fragilis* (var. f.) More study is needed. In recent decades, the concept of *fragilis* has become limited to relatively northern (circumboreal) tetraploids derived from crossing of *C. reevesiana* Lellinger and an unknown parent, presumed extinct; see also *tenuis*. A coll. from TRIM (KY) has been annotated "probably *fragilis* x *reevesiana*" by Haufler, and *fragilis* was mapped in Ky. by Haufler et al. in FNA 2. There is also a coll. from LAUR (EKY) that may be this species, and there are records from the mountains of Va. and N.C. (W).

C. fragilis differs from *protrusa* and *tenuis* as follows (W): its leaf blades are relatively elongated (l/w ca. 3-4 versus 2-2.5), with pinnae usually perpendicular (versus ascending); its pinnules have serrulate margins (versus crenulate), and the basal ones are strictly sessile with a rounded to truncate bases (versus often short-stalked, with rounded to cuneate base); its indusia are lanceolate, up to 1 mm long (versus ovate to round, ca. 0.5 mm).

0077--Phegopteris hexagonoptera (Michx.) Fée

Thelypteridaceae [Polypodiaceae]: Phegopteris [Thelypteris] hexagonoptera
This widespread eastern species is typical of woods on mesic, medium-acid soils, usually also suitable for beech trees.

HAB 5,11,7 C 1. **ABU** g10 s10 -3.

0078--Macrothelypteris torresiana (Gaud.) Ching

Thelypteridaceae [Polypodiaceae]: Macrothelypteris [Thelypteris] torresiana
This pantropical rhizomatous weed spread from se. Asian islands in association with horticulture and agricultural development (FNA 2). It is spreading across southeastern states (W), and was recently collected in TODD (D. Estes, pers. comm.).

ALI AS. **HAB** 7,6 D? 4. **ABU** +4.

0079--Thelypteris palustris Schott var. pubescens (Lawson) Fern.

Thelypteridaceae [Polypodiaceae]: Thelypteris palustris var. pubescens
This is widely scattered in eastern North America, but restricted to open woods and marshy sites on wet acid soils. Typical palustris is Eurasian.

HAB 9,6 B 4. **ABU** g10 s6 -4.

0080--Thelypteris noveboracensis (L.) Nieuwl.

Thelypteridaceae [Polypodiaceae]: Thelypteris <Parathelypteris> noveboracensis

This occurs in northeastern and Appalachian regions, with somewhat disjunct western extensions to the Shawnee Hills and Ozarks.

HAB 6,7,5 B 3. **ABU** g10 s10 -3.

0081--Thelypteris dentata (Forsk.) E. St. John

Thelypteridaceae [Polypodiaceae]: Thelypteris <Christella> dentata
This is considered adventive from tropical regions (Cranfill 1980). There are colls. (DHL) from BELL (14 Jul 1940, Clear Creek Springs) and NELS (Oct 1940, Nazareth College Gymnasium).

ALI AS. **HAB** 10? C? 6? **ABU** +4.

0082--Dryopteris carthusiana (Vill.) H.P. Fuchs

Dryopteridaceae [Polypodiaceae]: Dryopteris carthusiana (spinulosa/austriaca var. s.)

This widespread northern (almost circumboreal) tetraploid ($2n = 164$) is derived from hybridization of *intermedia* and "*semicristata*"--a hypothetical species that may now be extinct (Cranfill 1980, FNA 2). Back crosses with *intermedia* are occasionally found; colls. from HENR (KY) and perhaps elsewhere (MCRE, MORG, WOLF) may be referable to this hybrid rather than the pure species. In Ky. *carthusiana* is widely scattered within seasonally damp woods on fertile soils, but it is generally rare. *D. campyloptera* Clarkson is a similar species of cool northeastern regions and high Appalachian summits that has been reported from Ky. (RAB) but not verified; its occurrence remains dubious (FNA 2).

HAB 6,7,5 D 2. **ABU** g10 s6? -2.

0083--Dryopteris intermedia (Muhl. ex Willd.) Gray

Dryopteridaceae [Polypodiaceae]: Dryopteris intermedia (austriaca/spinulosa var. i.)

Although widely mapped across Ky. and Tenn. by FNA 2, this northeastern diploid ($2n = 82$) is largely restricted here to mesic woods in regions with sandy acid soils. The hybrid with *marginalis* is occasionally found, with colls. from CALD, EDMO, HARD and HART (Cranfill 1980). See also notes under *carthusiana*.

HAB 5,7 B 1. **ABU** g9 s9 -1.

0084--Dryopteris marginalis (L.) Gray

Dryopteridaceae [Polypodiaceae]: Dryopteris marginalis

This diploid ($2n = 82$) is widespread in eastern states (except to sw.), but it is largely restricted to deep woods in rocky ravines.

HAB 5,11 D 1. **ABU** g10 s9 -2.

0085--Dryopteris goldiana (Hook. ex Goldie) Gray

Dryopteridaceae [Polypodiaceae]: Dryopteris goldiana

In Ky. this northeastern diploid ($2n = 82$) occurs mostly in Appalachian regions, but with several disjunct populations in ravines further west. See also notes on *celsa* under *ludoviciana*.

HAB 5 C 1. **ABU** g9 s8 -2.

0086--*Dryopteris ludoviciana* (Kunze) Small

Dryopteridaceae [Polypodiaceae]: *Dryopteris ludoviciana*
This southern diploid ($2n = 82$) is typical of swamps on the Coastal Plain. The coll. from WARR (MO) was made in the 1880s or 1890s by S. Price, labelled just "Bowling Green, Ky." The related taxa, *D. celsa* (W. Palmer) Small and *D. cristata* (L.) Gray, have been reported from Ky. or nearby (RAB, FNA 2, Ch), but these are not verified and at least some reports are based on misidentifications (Cranfill 1980, M). *D. celsa* is an allopolyploid derived from *ludoviciana* and the more northern *goldiana*; it has been reported from all states around Ky. *D. cristata* is apparently an allopolyploid derived from *ludoviciana* and the extinct "semicristata"; it is largely northern but with scattered sites south to Ala. and N.C. (W).

HAB 6 C 2. **ABU** g7 s1 -6?

0087--*Cyrtomium fortunei* J. Smith

Dryopteridaceae [Polypodiaceae]: *Cyrtomium* [Polystichum] *fortunei* (falcatum var. fo.)
This East Asian species (as an apogamous triploid) is established at scattered sites in southeastern states, usually in old mortar of brick walls (FNA 2, K, W). It was recently discovered on rocky ground at the base of limestone cliffs along the Green Rv. in HART (WKY; A. Hulsey & A. Meier, in prep.). There is also a recent report from Jennings Co., Ind. (herbarium of Ind. Univ. SE).
ALI AS. **HAB** 5 D 3. **ABU** +4.

0088--*Polystichum acrostichoides* (Michx.) Schott

Dryopteridaceae [Polypodiaceae]: *Polystichum acrostichoides*
This is widespread across eastern North America, especially in woods on moderately damp to dryish, medium-acid soils.
HAB 5,7 C 2. **ABU** g10 s10 -2.

0089--*Polystichum acrostichoides* (Michx.) Schott f. incisum

Dryopteridaceae [Polypodiaceae]: *Polystichum acrostichoides* f. *incisum*
Although distinctive looking, this occasional form is not recognized in recent treatments. It is virtually unknown in calcareous regions of the state, whereas typical plants are more widespread.
HAB 5,7 C 2. **ABU** g9? s7? -2.

0090--*Pleopeltis polypodioides* (L.) Andrews & Windham var. michauxiana (Weatherby) Andrews & Windham

Polypodiaceae: *Pleopeltis* [Polypodium] *polypodioides* var. *michauxiana*

This is widespread across eastern North America and Mexico. In Ky. it is found mostly on old spreading limbs and trunks of elms, oaks and other trees (Cranfill 1980). It also occurs on flatter outcrops of limestone, and sometimes shales or sandstones that may accumulate relatively base-rich soil. In general it is most common at sites that probably experience much daily fluctuation in humidity: near lakes, swamps or rivers; and on exposed points or narrow ridges where condensation often occurs at night.

HAB 5,11 ^\ D? 4. **ABU** g10 s9 -1.

0091--*Polypodium appalachianum* Haufler & Windham

Polypodiaceae: *Polypodium appalachianum* [diploid "virginianum"]
See notes under *virginianum*. Outlying western records may deserve further verification; but see Cranfill (1980, 1991).
HAB 5 +\ A 2. **ABU** g9? s8 =.

0092--*Polypodium virginianum* L.

Polypodiaceae: *Polypodium virginianum* [tetraploid]
This is a widespread, northeastern tetraploid ($2n = 148$) derived from crossing of two diploids: *P. appalachianum* (a largely Appalachian species) and *P. sibiricum* Siplivinsky (a boreal species). Without microscopic work, distinction from *appalachianum* is often difficult based on gross morphology (Cranfill 1980; FNA 2; W).

Fronds of *virginianum* tend to be narrower (averaging 4.5 cm versus 5.8 cm), especially at the base (with oblong-lanceolate versus elongate-deltoid shape). Pinnae usually have blunt to rounded tips (versus acute to blunt); basal ones are unnotched on their lower side or just slightly (versus notched to 1-1.5 mm from the midrib). Rhizome scales tend to be narrower (averaging 1.1 mm versus 1.5 mm), and mostly with a darker brown central stripe (versus uniformly brown). Sterile triploid hybrids with *appalachianum* are occasionally found, with intermediate characters: as in colls. from MENI, MERC, PERR, ROWA, WOLF and elsewhere (at KY, EKY, etc.).
HAB 5 +\ A 2. **ABU** g10? s9 =.

0093--*Ginkgo biloba* L. C

Ginkgoaceae: *Ginkgo biloba*
Although widely planted, seedlings are almost never found. A self-sown tree 20 ft tall was found along a fence row in JEFF (MM for WKY).
ALI AS.

0094--*Picea rubens* Sarg. R

Pinaceae: *Picea rubens*

This northeastern tree ("red spruce") occurs at high elevation in the Appalachians. It has not been recorded from Ky., but it might have occurred here before settlement. There is a curious historical reference to 2,226 thousand board-feet of red spruce lumber produced in Ky. during 1909 (Murphy 1917: Tables 1 and 3). Presumably mills used trees floated down into the Big Sandy Rv. from Va. and W.Va. There are records of red spruce from ca. 50 miles away in those states (HFG, HW+, PL). There may also have been confusion with *Tsuga canadensis*, which was known as "spruce pine" in pioneer Ky. The Norway spruce--*P. abies* (L.) Karst.--is widely planted but seedlings rarely establish, and it does not seem to become naturalized (M).

0095--*Tsuga canadensis* (L.) Carr.

Pinaceae: *Tsuga canadensis*

This northeastern tree is locally common in most Appalachian regions, where the old name "spruce pine" has been replaced by "hemlock" in modern usage. Barton (1919) indicated that it was most abundant in or near the Cumberland Mts., in the southern Cumberland Plateau, and in or near the North Fork of Kentucky Rv. watershed. Hemlock also occurs in small disjunct populations further west, at least as far as the sandstone ravines in the middle Green Rv. watershed. However, reports from BARR, TODD, TRIG and WEBS (CW) are omitted here pending clarification of their status. Although it is widely planted, escapes are not documented.

It is clear that most *Tsuga* in Ky. is now threatened with devastation by the hemlock wooly adelgid (www.uky.edu/~sfei2/hwa.htm). It is likely that much funding will be applied to insecticide treatments by some landowners, but a fully integrated long-term program remains elusive (www.forestry.ky.gov/programs/health; www.ca.uky.edu/entology/entfacts/ef452.asp). One aspect of the research we need is to document genetic variation in more detail, including study of disjunct populations to see if they represent distinct genetic lineages from different periglacial refugia; initial work has failed to detect such patterns (Wang et al. 1997; R. Van Stockum, pers. comm.).

HAB 5 A 1. **ABU** g9? s8 -2.

0096--*Pinus strobus* L.

Pinaceae: *Pinus* <Strobus> *strobus*

This northeastern species is native to a few restricted localities, as mapped with solid dots here, but it is also widely planted and can spread from seed. Open dots are based on plants that are probably self-sown from plantings, or spread more locally from native populations after settlement. It is difficult or impossible to distinguish native from naturalized populations in some cases. Moreover, the decline of forest fires during the past 50-100 years has facilitated expansion of this fire-sensitive species in some areas.

The largest concentration of native trees may have been in WOLF, MENI and adjacent counties, centered on the Red River Gorge (Gm, Barton 1919). This was disjunct from the more extensive population further south on the Cumberland Plateau, in MCRE (mostly near the Big South Fork) and several counties of Tenn. (Ch). Further west, small native populations occur along sandstone ravines of Clifty Creek and its tributaries in LOGA, MUHL and TODD; Gm also listed CRIT.

HAB 5,11,7 B 2. **ABU** g10 s7 +2.

0097--*Pinus taeda* L.

Pinaceae: *Pinus taeda*

This widespread southeastern species is not native to Ky., but it is widely planted, especially in southwestern regions. Self-sown trees have been found in CALL (MM for WKY) and perhaps elsewhere (CW); records with uncertain status (perhaps even from planted trees) are mapped as open dots. *P. taeda* may become more naturalized, especially with global warming.

ALI S. HAB 10,7 C 4. **ABU** +4.

0098--*Pinus rigida* P. Mill.

Pinaceae: *Pinus rigida*

This largely Appalachian species is often hard to distinguish from the more southern *echinata*. Reports of *rigida* from west of the Appalachian Plateaus are not mapped here, pending clarification of their status (Gm, CW); Gm reported this species west along the Knobs as far as BULL (Gm). On the Cumberland Plateau, it extends south to near the state line, but perhaps not into Tenn. (Ch).

P. rigida differs from *echinata* (F, Cr, FNA 2, J) in its generally broader seed-cones (ca. 4-8 x 6-7 cm versus 4-6 x 3-4 cm), the scales relatively thick, with distinct dark reddish-brown inner distal margins (versus lacking contrast), the prickles up to 3 mm (versus 2 mm). Its needles are relatively rigid, ca. 1-1.5 (2) mm wide, mostly in 3s (versus 0.7-1.3 mm wide, in 2s or 3s); twigs are initially orange-brown (versus greenish to reddish-brown and

often glaucous), becoming ca. 5-7 mm thick in second year (versus 3-5 mm), with strongly resinous buds ca. 1-1.5 cm long (versus 0.7-1 cm); bark plates lack resin pockets (usually evident in *echinata*).

HAB 12,10,11,9 A 3. **ABU** g8 s8 -1.

0099--*Pinus echinata* P. Mill.

Pinaceae: *Pinus echinata*

This southeastern tree has been widely planted in Appalachian regions and locally elsewhere, outside its native range, including Mammoth Cave National Park (EDMO, HART) and Land-Between-the-Lakes (LYON, TRIG).

Included here are historical data of Gm, B and Wharton (1945). Not mapped are western colls. that are probably from planted or escaped individuals; for these, see Cranfill (1991), CW, KY (GRAY, OHIO) and MUR (CALL, MARS). However, there are native trees in w. Tenn. just south of TRIG and CHRI.

P. echinata was locally abundant in original woodlands of the southern Cumberland Plateau, and it probably increased after initial logging and efforts at clearance on southern Appalachian uplands. Much has died during 1999-2002 due to bark beetles, but a new generation could be fostered by burning remaining oak woodland to promote the grassy conditions into which this species tends to regenerate.

Distinction from *virginiana*, *rigida* and *taeda* is often difficult with leaves alone; keys need to be developed for use with whole plants in the field (FNA 2, J, W). There may be some introgression, especially with *rigida* (FNA 2, CW), but that is not well documented with colls. or analysis.

HAB 12,10,11,7 B 3. **ABU** g9 s9 -2?

0100--*Pinus pungens* Lam. R

Pinaceae: *Pinus pungens*

This tree of the high central Appalachians was reported from Ky. by DeFries (1884) and Gm, but no colls. have been located. *P. pungens* does occur in s. W.Va. and w. Va., within 50 miles of Ky. (PL).

0101--*Pinus virginiana* P. Mill.

Pinaceae: *Pinus virginiana*

This largely Appalachian tree has been planted in some parts of Ky. for "reclamation" of eroded soils, especially during the 1930s. Records that are probably from naturalized trees, or perhaps adventive from nearby native

populations, are included as uncertain records in the map (open dots). There are rare self-sown trees scattered in hilly parts of the Bluegrass region, but these are probably all dispersed from nearby plantings.

HAB 12,10,11,7 B 4. **ABU** g9 s9 +1.

0102--*Taxodium distichum* (L.) L.C. Rich.

Taxodiaceae [Cupressaceae]: *Taxodium distichum*

Several records are mapped here as uncertain (open dots). Outlying records of this southeastern species in c. Ky. may be from recently adventive or planted individuals. In a few cases only seedlings have been found. Not mapped are the mature trees in FAYE, JESS, SCOT and WOOD, which are probably planted (Gm), although sometimes interpreted as native (Meijer 1976b) or adventive (CW).

A coll. from FULT (EKY) has suggested *T. ascendens* Brong. (= *T. distichum* var. *imbricarium* (Nutt.) Croom); see BA and CW. However, that taxon appears restricted to the southeastern Coastal Plain, without extending far up the Mississippi Valley (FNA 2). Some colls. are difficult to distinguish (J), and there is some intergradation further south.

HAB 3 ~ C 3. **ABU** g9 s8 -2.

0103--*Thuja occidentalis* L.

Cupressaceae: *Thuja occidentalis*

In Ky. this northeastern tree occurs in the wild mostly on calcareous bluffs of the Cumberland Rv. and its Big South Fork. It has also been widely planted. East Asian relatives classified in the genera *Thuja* or *Platycladus* have also been planted but escapes from seed are virtually unknown in Ky. (CW) or elsewhere in North America (FNA 2, PL, W).

HAB 11,5 +\ D 2. **ABU** g10 s4 =.

0104--*Juniperus communis* L.

Cupressaceae: *Juniperus communis* {+ var. *depressa*}

In Ky. this widespread northern (circumboreal) species is known from only two localities. The taxonomy of segregates in North America remains somewhat uncertain (as reviewed by W). Plants of PULA (KY) are relatively low-growing (mostly 0.5-1 m tall) and may be referred to var. *depressa* Pursh. Plants of MENI (KY) are clearly more erect in the wild and in cultivation (up to 2 m or more). Plants of both provenances have been cultivated for 20 years in front of JC's residence; an attempt was made in 2011 to transfer both to the Univ. of Ky. Arboretum, but only one MENI plant survived.

HAB 12 +\ B 4. **ABU** g10 s3 =.

0105--Juniperus virginiana L.

Cupressaceae: Juniperus <Sabina> virginiana

This browsing-resistant tree became widespread and locally dominant in rough pastures and old fields after settlement, when it was largely restricted to more open woods on rocky calcareous soils. Even as late as ca. 1910 (Gm, Barton 1919), it was reportedly concentrated in or near: (a) the eastern Pennyrhile Karst Plain (especially LOGA) and western Knobs; (b) the southern Cliff Section (especially PULA and WAYN); and (c) more locally along the Kentucky River Palisades. Barton's data indicate two remarkable bands from north to south across the state: (a) and (b plus c).

Sabina may be a reasonable genus (W), and the name *S. virginiana* (L.) Antoine would then be applied to this widespread species of eastern and central North America. However, there would be much popular resistance to the change. The more columnar form with ascending branches, named var. *crebra* Fern. & Grisc., has been reported by Davies (1955a) and others (CW), but verified colls. are unknown. That northern segregate was recognized in the manuals of F and Cr, but not in more recent treatments (FNA 2, W).

HAB 12,10,11,7 D 4. **ABU** g10 s10 +3.

0106--Taxus canadensis Marsh.

Taxaceae: *Taxus canadensis*

Reports of this northeastern shrub from EDMO (Hussey 1876) and OWSL (Gonsoulin 1975) may be supported by colls., but remain unverified. Disjunct plants also occur in c. Ind. (D, PL).

HAB 5,11 D 2. **ABU** g10 s4 =.

0107--Taxus cuspidata Sieb. & Zucc. C

Taxaceae: *Taxus cuspidata*

Although this Japanese species is widely cultivated, there is only one record of a self-seeded plant, from JEFF (MM for WKY). There must be factors generally preventing its naturalization. The European *T. baccata* L. may also rarely establish near plantings; CW noted a coll. from WHIT (EKY). However, identification of young plants is problematic (FNA 2); keys are needed.

ALI AS.

0108--Nuphar advena (Ait.) Ait. f.

Nymphaeaceae: *Nuphar* <*Astylus*> *advena* (luteum ssp. *macrophyllum*)

This is widespread in eastern North America. The northeastern species, *N. variegata* Dur. (sometimes known as a var. or ssp. of *advena* or *luteum*), has also been reported but apparently in error (M). Its range overlaps little with *advena*, but there may be introgression in mid-Atlantic states (FNA 3; Padgett 2007). *N. advena* can have occasional reddish coloration of flower and fruit parts (especially in western populations), but *variegata* has distinctly dark red or purplish fruits and also differs in its flattened petioles (W).

HAB 2,1 ~ D 5. **ABU** g10 s8 -2.

0109--Nymphaea odorata Ait.

Nymphaeaceae: *Nymphaea odorata* (tuberosa)

This variable species is widespread across North America, with various segregates recognized to the north, west and south. Some cultivars and hybrids have been introduced for ornamental use in ponds. A coll. from GRAN (KNK) has been identified as the sterile hybrid with the southern species, *N. mexicana* Zucc. (*X thiona* Ward); see notes in FNA 3.

HAB 2 ~ C 5. **ABU** g10 s7? -3.

0110--Brasenia schreberi J.F. Gmel.

Cabombaceae [Nymphaeaceae*]: *Brasenia schreberi*

This monotypic genus is widespread in humid regions of temperate to tropical North America, and elsewhere in the World, except Europe. It occurs in "oligotrophic or mesotrophic ponds [especially Ky.], lakes and sluggish streams" (FNA 3).

HAB 2 ~ C 6. **ABU** g10 s8 -2.

0111--Cabomba caroliniana Gray

Cabombaceae [Nymphaeaceae*]: *Cabomba caroliniana*

This submersed floating plant is widely scattered in "acidic to alkaline" waters of eastern states, except the upper midwest, and most common on the southeastern Coastal Plain (FNA 3). It is easily missed and rarely collected in Ky. Disjunct records from JEFF (DHL, KSNPC) are old (1938, 1940, 1957) and perhaps from adventive or planted populations, but there were large natural ponds in the county before settlement.

HAB 2 ~ C 6. **ABU** g8 s3 -3.

0112--Schisandra glabra (Bickn.) Rehd.

Schisandraceae [Illiciaceae]: *Schisandra glabra* (coccinea)

This woody vine is widely scattered over southeastern states, but uncommon to rare in most regions. It is generally restricted to thin mesic woods and edges near rocks, streams or wetlands. In Ky. plants have been discovered in Appalachian ravines by F. Levy (PIKE; coll. at UNC) and D. Taylor (MCRE; coll. at BEREA). It is easily overlooked or mistaken for *Celastrus scandens*.
HAB 5 C 3. **ABU** g7 s2 -1.

0113--*Ceratophyllum demersum* L.

Ceratophyllaceae: *Ceratophyllum demersum*

In Ky. this cosmopolitan aquatic species is known mostly from large old sloughs and ponds. It does not typically occur in artificial lakes or ponds.
HAB 2 ~ E 6. **ABU** g10 s8? -3.

0114--*Ceratophyllum echinatum* Gray

Ceratophyllaceae: *Ceratophyllum echinatum*

There has been some taxonomic confusion with the closely related *C. submersum* L. or *C. muricatum* Chamisso, which occur in Eurasia and can be defined in a narrow sense to exclude American plants (as reviewed in W). *C. echinatum* is widely scattered in eastern North America and the Pacific northwest, but is much less frequent than *demersum*. In Ky., Tenn. (Ch) and Mo. (Y) *echinatum* is known from a few natural ponds or sloughs that are somewhat removed from major river valleys, occasionally even in sinkhole ponds or springs. The alien *Myriophyllum spicatum* could be a serious competitor in these habitats, especially with increase in eutrophic conditions.
HAB 2 ~ D 6. **ABU** g9 s5 -4.

0115--*Magnolia grandiflora* L. C

Magnoliaceae: *Magnolia grandiflora*

As a native, this broadleaf evergreen tree is largely restricted to the southeastern Coastal Plain, and almost absent from the Mississippi Valley north of La. In Ky. occasional seedlings establish from nearby plantings, but it does not seem to be spreading yet across the landscape. There are colls. from MADI and MCRA (EKY; Clark et al. 2005).
ALI S.

0116--*Magnolia acuminata* (L.) L.

Magnoliaceae: *Magnolia acuminata*

Although largely Appalachian, this species has several disjunct western populations, especially in the Shawnee Hills (s. Ind., w. Ky.), in the loess bluffs of the Mississippi Rv. (from s. Ill. downstream), and in the Ozark Mts.

(n. Ark, s. Mo.). In the original forests of Ky., it may have been most common in the Cumberland Mts. and nearby, but relatively infrequent in the "Low Hills Belt" between the mountains and the Cliff Section (Barton 1919, Braun 1950). Further documentation is needed for some of the outlying western populations. The coll. from SHEL (DHL) appears reliable but should be rechecked for potential cultivated status; see also Linney (1880).
HAB 5 C 2. **ABU** g9 s9 -2.

0117--*Magnolia tripetala* (L.) L.

Magnoliaceae: *Magnolia tripetala*

This species occurs mostly in Appalachian regions, but with disjunctions west to the Ozark-Ouachita region (FNA 3, PL). Within Ky. several outlying western records need further verification (Pr, Gm, M).
HAB 5,4,7 B 2. **ABU** g9 s9 -3.

0118--*Magnolia pyramidata* Bartr.

Magnoliaceae: *Magnolia pyramidata* (fraseri var. p.)

This southeastern species is largely restricted to the Gulf Coastal Plain, and is unknown in Mo. or Tenn. The disjunct coll. from banks of the Mississippi Rv. in FULT (KY) is verified, but plants have not been relocated in recent decades. It was also reported by Defries (1880) from the Tradewater Rv. region (perhaps CRIT).
HAB 5? B? 2? **ABU** g8? s1? -6?

0119--*Magnolia fraseri* Walt.

Magnoliaceae: *Magnolia fraseri*

In Ky., this southern Appalachian species mostly occurs on the Cumberland Mts., but there are scattered records further west from the adjacent rugged hills and from ravines along the Big South Fork of Cumberland Rv.
HAB 5,11 B 2. **ABU** g8 s7 =.

0120--*Magnolia macrophylla* Michx.

Magnoliaceae: *Magnolia macrophylla*

This is most common in western parts of the southern Appalachians, especially the Cumberland Plateau, but it also occurs in disjunct populations across southeastern states (FNA 3, PL). In Ky., records from EDMO are verified but those from GRAY and WARR remain uncertain (M).
HAB 5,11,7 A 2. **ABU** g9 s9 =.

0121--*Liriodendron tulipifera* L.

Magnoliaceae: *Liriodendron tulipifera*

This widespread in states east of the Mississippi Rv. Although probably native to all counties of Ky., it is much less frequent on more base-rich soils. It was virtually absent in the original woods on uplands of the central Bluegrass (Barton 1919; Campbell 1989).

HAB 5,7 C 2. **ABU** g10 s10 -2.

0122--*Asimina triloba* (L.) Dunal

Annonaceae: *Asimina triloba*

This small useful tree of east-central states is widely distributed in mesic to submesic woods on fertile soils, and it is especially abundant in thin woods and edges with moderate disturbance. It is generally avoided by deer, but does not usually survive with livestock. In FAYE and nearby, Short (1828-9) noted: "This portion of Kentucky was once the paradise of pawpaws, where immense orchards of large trees were every where met with; but cultivation and the ravages of cattle have greatly lessened the number." There is much variation in fruit characteristics, and at Ky. State Univ. Pomper et al. (2008) have been engaged in a national program to make selections for human use.

HAB 7,5 D 2. **ABU** g10 s10 -3.

0123--*Calycanthus floridus* L. var. *glaucus* (Willd.) Torr. & Gray

Calycanthaceae: *Calycanthus floridus* var. *glaucus* (fertilis)

This species occurs in southeastern states east of the Mississippi Rv. It is clearly native in the upper Cumberland Rv. watershed, at least in MCRE and WHIT. Var. *glaucus* is locally common along the Big South Fork and tributaries. However, disjunct plants in KNOT, POWE, ROWA, MCRA and elsewhere have probably escaped or persisted after cultivation; these are mapped as open dots. Reports of the more pubescent var. *floridus* are erroneous or based on cultivated plants (M).

HAB 11,5,7 B 3. **ABU** g9 s4 -1?

0124--*Sassafras albidum* (Nutt.) Nees

Lauraceae: *Sassafras albidum*

This is widespread in eastern states, except the upper midwest. Although widely scattered in Ky., it is virtually absent on more base-rich soils. It was formerly more abundant in old fields and other transitions to farmland, before suppression of fire and invasions by *Pinus virginiana* and *Juniperus virginiana*. Gm noted: "sprouts of this plant, with persimmon, green brier and others make work for those desirous of clearing land quickly." The "sassafras-

persimmon forest cover type" of ca. 1900-1950 that was outlined by Society of American Foresters (Eyre 1980) is now virtually all gone, at least in Ky.

HAB 7,8,10 C 3. **ABU** g10 s10 -1.

0125--*Lindera benzoin* (L.) Blume

Lauraceae: *Lindera benzoin*

This is widespread in eastern states, except the upper midwest. Like *Asimina*, *Lindera* is virtually unbrowsed by deer, and often becomes common in the understory of mesic woods. Scattered plants in Ky. with more hairy leaves and twigs have been called var. *pubescens* (Palmer & Steyermark) Rehd., which may form a reasonable southern segregate (W). However, no significant difference in range or habitat has been found within Ky. The more southern *L. mellissifolia* (Walt.) Blume was reported by Linney (1880, 1882), but this was undoubtedly erroneous; that species is more hairy than *L. benzoin* var. *pubescens* and there are other differences (FNA 3, W).

HAB 5,7,4,6 D 1. **ABU** g10 s10 -3.

0126--*Asarum canadense* L. var. *canadense* {incl. var. *acuminatum* Ashe}

Aristolochiaceae: *Asarum canadense* var. c. {or var. *acuminatum*}

This taxon, with relatively long calyx lobes, may be largely northeastern and Appalachian (W). The mapping here is provisional; further study will be needed after current revision by D. Estes (pers. comm.) and others. Var. *acuminatum* Ashe has exceptionally long calyx lobes, even in early floral development; it may be another distinct taxon common across Appalachian regions or perhaps restricted to higher elevations (as in BELL and HARL).

HAB 5 C? 1. **ABU** g8? s7? -1.

0127--*Asarum canadense* L. var. *reflexum* (E.P. Bickn.) B.L. Rob.

Aristolochiaceae: *Asarum canadense* var. *reflexum*

Mapping here is provisional, but this taxon does appear to be usually distinct and concentrated from the upper midwest to the southern Ridge-and-Valley and Piedmont (W; D. Estes, pers. comm.). Treatment of *reflexum* remains controversial, from combination with the more northeastern *canadense* (FNA 3; Kelly 2001) to full species status (Sm).

Var. *reflexum* differs from most other *canadense* (F, W) in its calyx lobes 5-10 (12) mm long (versus 10-35 mm), strongly reflexed to often more or less appressed back against the calyx tube (versus spreading to ascending from the base), and acute or acuminate (versus acuminate with caudale inrolling tips 4-20 mm long). Also, leaves are more kidney-shaped, with broad lobes and a

blunt apex (versus more acute to acuminate). Somewhat intermediate plants known as var. *ambiguum* (Bickn.) Farw. occur mostly at intermediate elevations in the Southern Appalachians, and are confirmed in sw. Va. (Lee Co.), but perhaps not in Ky. (D. Estes, pers. comm.).

HAB 5 D 1. **ABU** g8? s5? -2.

0128--Hexastylis contracta Blomquist

Aristolochiaceae: *Hexastylis* [Asarum] *contracta*

This is known only from the Cumberland Plateau, mostly in Tenn., and from the Blue Ridge in North Carolina. It is closely related to the larger-flowered *H. shuttleworthii* (Britten & Baker f.) Small, a more widespread southern Appalachian species that occurs nearby on the Plateau in Tenn. and in the Ridge & Valley of Va. *H. contracta* has also been confused with *heterophylla*, which has been misidentified as *contracta* in LETC (e.g. in earlier Natural Heritage databases). Some plants along Rock Creek in w. MCRE can appear hybridized with *ruthii*, but probably just represent variation within *contracta*; hybrids are not reported in the genus (FNA 3; W).

HAB 5,11 A 1. **ABU** g6 s3 -1.

0129--Hexastylis virginica (L.) Small T

Aristolochiaceae: *Hexastylis* [Asarum] *virginica*

Reports from Ky. (Gaddy 1987; FNA 3) appear to have been associated with a broader concept of the species, which was somewhat confused with *heterophylla* and *contracta* (M). *H. virginica* in its narrow sense occurs mostly in the central Appalachians, Piedmont and eastern Coastal Plain of N.C., Va., Md. and perhaps W.Va. There are no known colls. of typical *virginica* from Ky., though some *heterophylla* may appear transitional (Abbott et al. 2004).

0130--Hexastylis heterophylla (Ashe) Small

Aristolochiaceae: *Hexastylis* [Asarum] *heterophylla*

This is a relatively common Southern Appalachian endemic (W), but it is replaced by *contracta* on much of the Cumberland Plateau.

HAB 5,11 A 1. **ABU** g9 s6 =.

0131--Hexastylis ruthii (Ashe) Small

Aristolochiaceae: *Hexastylis* [Asarum] *ruthii* (*arifolia* var. *r.**)

This Southern Appalachian taxon has often been combined with *H. arifolia* (Michx.) Small, which occurs mostly on the southeastern Coastal Plain but not in Ky. *H. ruthii* has smaller calices, more gradually narrowed to the lobes, which are smaller and less spreading (F, Cr, W); lobes are 2-4 mm long

(versus 2.5-8 mm) and 2-4 mm wide at base (versus 3-9 mm). Gaddy (1987) reported a disjunct record of *ruthii* from CHRI, without details, but this has not been confirmed and it was not mapped in FNA 3.

The chemistry of essential oils (including phenol ethers) in *Hexastylis* deserves further research (Hayashi et al. 1983; W). D. Stephens (of Whitley City, pers. comm.) has found that the aroma of *ruthii* is sweet and anise-like, whereas *contracta* is sassafras-like; they can easily be distinguished by smell alone. D. Barrett (pers. comm.), of Booneville (OWSL), has found that an extract of *ruthii* is effective in human reproduction.

HAB 5,11 A 1. **ABU** g8 s8 -1.

0132--Endodeca serpentaria (L.) Raf.

Aristolochiaceae: *Endodeca* [Aristolochia*] *serpentaria* (var. *s.*)

This is a widespread southeastern species. The distinction of *Endodeca* from *Aristolochia* has been justified by recent analysis of Ohi-Toma et al. (2006; see also W).

HAB 5,11 C 2. **ABU** g9 s9 -2.

0133--Endodeca hastata (Nutt.) new comb.

Aristolochiaceae: *Endodeca* [Aristolochia*] *hastata* (*serpentaria* var. *h.*)

These plants, traditionally known as *A. serpentaria* var. *hastata* (Nutt.) Ducharte, appear distinct from typical *serpentaria* in their linear to lance-deltoid shape (versus ovate to ovate-oblong), with divergent basal lobes (versus just cordate), ca. 1-2 cm wide (versus 2-5 cm). Also, leaves tend to be less pubescent and relatively thin-textured (W). *E. hastata* occurs mostly on the southeastern Coastal Plain (from e. Tex. to Va.), generally in subhydric bottomland forests. Typical *serpentaria* has a more widespread south-central range, typically in mesic to subxeric upland forests. Narrow leaves may be an adaptation to reduce egg-laying by the eastern pipe-vine swallowtail butterfly, which uses leaf shape as a search image (FNA 3).

HAB 6 C 2. **ABU** g7? s5? -3.

0134--Isotrema tomentosa (Sims) Huber

Aristolochiaceae: *Isotrema* [Aristolochia*] *tomentosa*

Several records have tentative identification, or may be escapes from cultivation; see notes under *macrophylla*.

HAB 5,6? C? 3. **ABU** g8 s8 -3.

0135--Isotrema macrophylla (Lam.) C.F. Reed

Aristolochiaceae: *Isotrema* [*Aristolochia**] *macrophylla* ("durior")
This is most common in or near the Blue Ridge and Cumberland Mountains, typically in forest gaps on mesic slopes, but there are scattered localities elsewhere in Appalachian regions (FNA 3). There is virtually no overlap in range with *tomentosa*, which occurs largely in or near the lower Mississippi Valley (broadly defined), typically in floodplain forests but sometimes on adjacent rocky bluffs as well.

These closely related species are easily confused. Without flowers, *tomentosa* can generally be distinguished by its more or less tomentose stems (versus essentially glabrous); difference in leaf pubescence is often not clearcut in Ky., though often used in keys elsewhere (e.g. FNA 3). Both species are sometimes cultivated and may occasionally escape.
HAB 5 C 3. **ABU** g8 s8 -1.

0136--*Saururus cernuus* L.

Saururaceae: *Saururus cernuus*
This rhizomatous herb is widespread in swampy areas of eastern states, except the upper midwest and New England. It generally emerges as water levels drop during the growing season. Also in Saururaceae, *Houttuynia cordata* Thunb. is an East Asian herb that is becoming widely grown for ornamental or culinary uses, and it is potentially invasive from gardens, where hard to eradicate.
HAB 2,3,1 ~ C 3. **ABU** g10 s10 -3.

0137--*Akebia quinata* (Houtt.) Dcne.

Lardizabalaceae: *Akebia quinata*
This vigorous East Asian vine has spread from cultivation at scattered sites across southeastern states (W). It is locally common in Louisville (JEFF), where it has been difficult to eradicate in gardens and parks.
ALI AS. **HAB** 7,5? D? 3? **ABU** +4.

0138--*Calycocarpum lyonii* (Pursh) Gray

Menispermaceae: *Calycocarpum lyonii*
This woody vine occurs mostly in the lower Mississippi Valley.
HAB 6,4? C? 3. **ABU** g8 s7? -3?

0139--*Cocculus carolinus* (L.) DC.

Menispermaceae: *Cocculus carolinus*

This vine is widespread in southern states and ne. Mexico. At the northern edge of its range, along the Kentucky Rv. Palisades and elsewhere, it tends to occur mostly on warmer aspects. Plants in Ky. do not become noticeably woody.

HAB 7,11,5 D 4. **ABU** g9 s8? -2.

0140--*Menispermum canadense* L.

Menispermaceae: *Menispermum canadense*
This species of east-central states is replaced by the congeneric *Cocculus carolinus* in warmer, drier regions, but there is some overlap in Ky. and Tenn. (Duncan 1967; PL). Plants in Ky. do not become woody to any significant degree.

HAB 7,4,5 D 3. **ABU** g10 s10 -2.

0141--*Podophyllum peltatum* L.

Berberidaceae: *Podophyllum peltatum*
This is widespread in eastern states. Although most common in woods, *Podophyllum* is persistent, unpalatable and often survives for decades in open pastured woods or fields. In the central Bluegrass, Short (1828-9) noted: "No portion of the Union affords the May-apple in greater abundance than this, where it is found in profusion in all rich shaded woodlands. The [fruit] is highly grateful to the taste of most persons; its leaves are deleterious and not eaten by any cattle."

HAB 5,7 D 2. **ABU** g10 s10 -3.

0142--*Jeffersonia diphylla* (L.) Pers.

Berberidaceae: *Jeffersonia diphylla*
This occurs mostly in the Ohio Rv. watershed and lower Great Lakes region. It is largely restricted to base-rich soils in relatively undisturbed, mesic to subxeric woods

HAB 5,11 E 1. **ABU** g9 s9 -3.

0143--*Caulophyllum thalictroides* (L.) Michx.

Berberidaceae: *Caulophyllum thalictroides* (var. t.)
This is widespread in deep, mesic woods on fertile soils in eastern states, except on the southeastern Coastal Plain. Some mapped records here may still be referred to *giganteum*; further revision is needed. *Caulophyllum* was relatively sensitive to excessive disturbance within the woods after settlement. In the central Bluegrass, Short (1828-9) noted: "...once abundant throughout this country, but has now almost disappeared from the more cultivated

districts, and is consequently rare about Lexington, being only met with in the more secluded and unfrequented woodlands."

HAB 5 E 1. **ABU** g9 s9 -3.

0144--Caulophyllum giganteum (Farw.) Loconte & Blackwell

Berberidaceae: *Caulophyllum giganteum* (thalictroides var. g.)

Mapping here is provisional. Some authors have doubted the rationale for distinction of *giganteum* (Cr, J, RAB). It is reported from central Appalachian to northeastern regions, centered on W.Va. to N.Y., but overlapping much with *thalictroides* (FNA 3). It may reach the southwest margin of its range in c. Ky. and c. Tenn. (PL).

Loconte & Blackwell (1985; FNA 3) insisted that *giganteum* is a species distinct from *thalictroides*, differing in its larger pistils (3-5 mm long versus 1-3 mm), styles (1-2 mm long versus 0.25-1 mm), stamen filaments (1.5-2.5 mm long versus 0.5-1.5 mm), and sepals (6-9 mm long versus 3-6 mm). Sepals are usually purple, less often red, brown or yellow (versus yellow to greenish-purple). It typically flowers about two weeks earlier, has fewer flowers per inflorescence (4-18 versus 5-70), less divided first leaves (mostly into 3 parts versus 4) but larger leaflets (5-10 cm long versus 3-8 cm).

HAB 5 E? 1. **ABU** g8? s8? -3.

0145--Berberis thunbergii DC.

Berberidaceae: *Berberis thunbergii*

This low shrub from Japan has had widespread ornamental use in Ky. after 1950 (Davies 1955; M), and it has often escaped. *B. thunbergii* does not seem to be increasing much in this state. However, its moderate shade-tolerance and deer-resistance has allowed it to prosper locally in more northeastern states. It has been reported from almost all counties of Ohio (SE).

The European *B. vulgaris* L. appears to have had very little use in the state, with no evidence of naturalization, but it became abundant in northern regions before extensive eradication during 1920-40 due to the wheat rust that it supports. *B. thunbergii* is immune to the rust (as reviewed by Y).

ALI AS. **HAB** 8,7,5,11 C? 3. **ABU** +5.

0146--Berberis canadensis P. Mill.

Berberidaceae: *Berberis canadensis*

This largely central Appalachian species is also disjunct in s. Mo., c. Ill. and n. Ind. It is generally associated with rocky riverbanks and glades. At least in

northern regions, it suffered locally from thorough eradication efforts along with *B. vulgaris* L. (a cultivated alien), since both species are hosts for the black stem rust of wheat (D, FNA 3, Y).

In Ky. *canadensis* has been found at two sites on open bouldery banks of the Big South Fork (Devil's Jump and Big Shoals). There is also an old obscure report from JEFF or nearby by McMurtrie (1819), and it has been reported from CALL by Woods & Fuller (1968) but their coll. has not been located. FNA 3 mapped it in n. Ky. and s. Ind., for unknown reasons. This species may also be expected in the Cumberland Mts., since it is known from adjacent parts of Appalachian states; e.g. in "The Cedars" of Lee Co., Va. (D. Boone, pers. comm.).

HAB 1 C 4. **ABU** g5 s2 -2?

0147--Hydrastis canadensis L.

Hydrastidaceae [Ranunculaceae*]: *Hydrastis canadensis*

This monotypic genus occurs widely in east-central states. It has been much reduced by harvesting for medicinal use of its roots, but in Ky. large patches are still found in some localities, and these tend to recover from harvesting if the digging is not excessive. *Hydrastis* grows in relatively deep woods, mostly on moderately dry, moderately base-rich soils. There has been increasing support for its treatment as Hydrastidaceae (as reviewed by W). Rafinesque (1836, 2:34) described an unusually large plant in "West Kentucky" that was "over one foot high" and "three leaved" on the stem; he called this *H. trifolia*.

HAB 5,11 D 1. **ABU** g10 s8 -4.

0148--Xanthorhiza simplicissima Marsh.

Ranunculaceae <Coptideae>: *Xanthorhiza simplicissima*

This occurs mostly in the southern Appalachians and Piedmont, but it is disjunct at other localities in southeastern states and it has escaped from cultivation in northeastern states. In Ky. (HARD), Tenn. and Miss., there are a few sites west of the Appalachians on sandy soils.

HAB 4,6 A 3. **ABU** g8 s8 -1.

0149--Cimicifuga rubifolia Kearney

Ranunculaceae <?Actaeae>: *Cimicifuga* [Actaea] *rubifolia*

This globally rare species occurs only in scattered localities from the southern Ridge-and-Valley to the Shawnee Hills. It is restricted to deep, mesic woods on base-rich soils.

HAB 5 D 1. **ABU** g5 s4 -3.

0150--Cimicifuga racemosa (L.) Nutt.

Ranunculaceae <?Actaeae>: Cimicifuga [Actaea] racemosa

This occurs mostly in or near central and southern Appalachian regions, but there are somewhat disjunct population west to the Ozarks (FNA 3; PL).

Although typical of fairly deep shade in mesic woods, it is a somewhat toxic, browsing-resistant species that can also occur in maturing old field woods or other transitions to farmland. Gm noted: "in mountainous sections this plant is often seen in partially cleared land used for pasture."

HAB 5,7 C 2. **ABU** g10 s9 -2.

0151--Cimicifuga americana Michx.

Ranunculaceae <?Actaeae>: Cimicifuga [Actaea] americana

This is mostly restricted to the Blue Ridge and nearby mountains, from se. Pa. to n. Ga. Further west it occurs locally on the central Appalachian Plateaus and one locality in nw. Ill. If transferred to Actaea, the name is A. podocarpa DC. (W).

HAB 5 D 1. **ABU** g8 s6 -1.

0152--Actaea pachypoda Ell.

Ranunculaceae <?Actaeae>: Actaea pachypoda ("alba")

This is widespread in eastern North America, but rare to absent on the southeastern Coastal Plain. Ga noted: "growing in rich woods and sometimes in partially cleared woodland pasture" (see also Cimicifuga racemosa and Podophyllum peltatum). The widespread northern species, A. rubra (Ait.) Willd. has been reported from Ky. by Hussey (1876; coll. at Purdue Univ.) and others in the 19th Century (M), but apparently based only on misinterpreted pachypoda. A. rubra has also been reported from nearby counties in s. Ill. (ML) and sw. Ohio (FNA 3).

HAB 5 C 2. **ABU** g10 s10 -3.

0153--Aconitum uncinatum L.

Ranunculaceae <Delphinieae>: Aconitum uncinatum

This is a remarkable, late-flowering, twining herb with a largely Appalachian range but also scattered west to s. Ohio, s. Ind. and Mo. (K). It is imperiled in much of its range, and reportedly secure only in W.Va. and Va. (NS). In Ky. the few records are from small, widely scattered patches, and it has disappeared from some localities. These sites are mostly on terraces and toe slopes with sandy soils, adjacent to floodplains.

HAB 4,5 C 3. **ABU** g5 s2 -2.

0154--Aquilegia canadensis L.

Ranunculaceae <Delphinieae>: Aquilegia canadensis

This is widespread in eastern North America, except of the southeastern Coastal Plain.

HAB 5,11 +\ D 2. **ABU** g10 s10 -1.

0155--Aquilegia vulgaris L. C

Ranunculaceae <Delphinieae>: Aquilegia vulgaris

This showy alien is often cultivated and has persisted at scattered sites in northeastern states. In Ky. there are colls. from CAMP (EKY), JEFF (DHL) and LAUR (EKY) but it is not clear if these plants were truly naturalized.

ALI EU.

0156--Delphinium tricorne Michx.

Ranunculaceae <Delphinieae>: Delphinium tricorne

This poisonous plant ranges across east-central states, but it is largely restricted to base-rich soils, and usually within somewhat mesic woods. In the central Bluegrass, Short (1828-9) noted: "Found on creek sides, particularly preferring rocky precipices. This is one of the plants which are indefinitely called staggerweed; to eating which the diseases of cattle are sometimes attributed."

HAB 5,7,11 E 2. **ABU** g10 s10 -2.

0157--Delphinium carolinianum Walt. ssp. calciphilum Warnock

Ranunculaceae <Delphinieae>: Delphinium carolinianum ssp. calciphilum

All plants of this species in Ky. are probably ssp. calciphilum, which is virtually restricted to flat limestone glades of the southern Interior Low Plateaus in Ala., Ga., Ky. and Tenn. (Warnock 1995; FNA 3). However, there has been a tortuous taxonomic trail; other segregates have been reported, and colls. should be rechecked (M).

The name D. virescens Nutt. has been partly misapplied to ssp. calciphilum, but belongs with closely related plants of the Great Plains now treated as D. carolinianum ssp. virescens (Nutt.) Brooks (including ssp. penardii (Huth) Warnock). Ssp. carolinianum occurs mostly on the southeastern Coastal Plain and in Ozarkian regions, often on non-calcareous soils. [A somewhat parallel situation occurs with Viola egglestonii, V. pedatifida and V. septemloba, respectively.]

HAB 12 == E 4. **ABU** g8? s4? -3.

0158--Delphinium exaltatum Ait. R

Ranunculaceae <Delphinieae>: Delphinium exaltatum

This globally rare species occurs mostly in the central Appalachians. It has been reported from Ky., but records are obscure or incomplete (M, J). There is a coll. of C.W. Short (GH) that might be from Ky. D. exaltatum is known in se. Ohio, and it may be expected in thinly wooded ravines of LEWI, draining the more open calcareous uplands.

0159--Consolida ambigua (L.) P.W. Ball & Heywood

Ranunculaceae <Delphinieae>: Consolida [Delphinium] ambigua (D. ajacis)

This old ornamental ("garden larkspur") has become locally common in pastures and roadsides for over a century (Gm, M), especially in the Bluegrass region.

ALI EU. **HAB** G-10,7 D 4. **ABU** +4.

0160--Caltha palustris L.

Ranunculaceae <Helleboreae>: Caltha palustris

In Ky. this northern (circumboreal) species of base-rich wetlands is known only from the following colls.: C.W. Short (PH), ca. 1840, "Beard's Branch near Lexington [FAYE]; and C.E. Mueller (KY), June 1883, Louisville [JEFF]. It has been found recently by D. Boone (pers. comm.) at a seep in Indian Hill, Hamilton Co., Ohio, within 5 miles of Ky.

HAB 6,2 ~ E 5? **ABU** g10 s0 -6?

0161--Enemion biternatum Raf.

Ranunculaceae <Helleboreae>: Enemion [Isopyrum] biternatum

This occurs mostly in the central Mississippi Valley and southern Great Lakes region, and it is largely restricted to mesic woods on base-rich soils.

HAB 5 E 2. **ABU** g9 s9 -3.

0162--Eranthis hyemalis (L.) Salisb.

Ranunculaceae <Helleboreae>: Eranthis hyemalis

This plant ("winter-aconite") is widely cultivated due to its showy yellow flowers and dissected leaves in early spring. It has slowly become naturalized at several wooded sites across east-central states, especially in suburban areas and associated parks (FNA 3). It has become locally abundant n JEFF (M. Medley #19934-94 for WKY).

ALI EU. **HAB** 5,7 D? 1. **ABU** +4.

0163--Trautvetteria carolinensis (Walt.) Vail

Ranunculaceae <Ranunculeae>: Trautvetteria carolinensis

Typical carolinensis (as opposed to plants in western North America and East Asia) is widely scattered across southeasterbn states, but common only within central and southern Appalachian regions (FNA 3). In Ky. it usually occurs along sandy banks of medium to large streams. West of the Appalachians, there are a few records from damp sandy flatwoods or associated thickets and grassy edges. These disjunct populations are precarious, and may have disappeared.

HAB 1,6 C 3. **ABU** g10 s7 -2.

0164--Ficaria verna Hudson

Ranunculaceae <Ranunculeae>: Ficaria [Ranunculus] verna (R. ficaria)

Segregation of Ficaria from Ranunculus is supported by recent analysis (Paun et al. 2005; W). It can be treated as a complex monotypic genus, with five subspecies escaped in North America; 2n = 16, 24 and 32. Plants in Ky. have been named ssp. calthifolia (Reichenbach) Nyman and others may be expected (Post et al. 2009; W).

Despite its aggressive tendencies, Ficaria (as "lesser celandine") has traditionally been grown in gardens for its showy yellow flowers in spring, followed by glossy cordate leaves. It has now become widespread in parts of northeastern states and seems to be increasing southwards. It generally occurs in young or disturbed floodplain woods, but it can also extend up adjacent slopes into damp shady areas. It is abundant in sw. Ohio and in Ky. it has become locally abundant at several locations in the Louisville area, especially in the parks systems (P. Haragan, pers. comm.). Records from other counties may just be small patches or waifs.

ALI EU. **HAB** 4,6 D 2. **ABU** +4*.

0165--Ranunculus longirostris Godr.

Ranunculaceae <Ranunculeae>: Ranunculus <Batrachium>. longirostris (aquatilis var. diffusus*, "trichophyllus")

This is widespread across cool-temperate regions of North America except in southeastern states. Nomenclature here follows W rather than FNA 3, which combined longirostris with the Eurasian aquatilis and the circumboreal trichophyllus. In Ky. it has been found only in a few streams of the central Bluegrass region, plus a recent discovery by P. Haragan in Floyd's Fk. of JEFF (EKY). Even Short (1828-9, with coll. at PH) did not know it well, noting only one site, under the name "R. fluviatilis (River crow-foot). A small

aquatic plant found in shallow-running waters. Found in Elk-horn on the George-town road: rare."

HAB 1 ~ E 5. **ABU** g9? s4 -3.

0166--Ranunculus trichophyllus Chaix var. trichophyllus R
Ranunculaceae <Ranunculeae>: Ranunculus <Batrachium>. trichophyllus
(aquatilis var. diffusus/capillaceus/calvescens)

There is an old coll. of this northern taxon from the herbarium of C.W. Short (NCU) with "Ky." printed on the label, but this need not indicate an origin from Ky. Reports of trichophyllus or its synonyms by McFarland (1942), Keener (1976), BA and others were presumably based on the Short coll. or on longirostris (M). Verified trichophyllus may not extend closer than the higher mountains of Va. and W.Va. and glaciated land in Ohio to Ill, but there are a few somewhat dubious reports south to Tenn. and N.C. (Ch, D, ML, W; PL),

0167--Ranunculus ambigens S. Wats.

Ranunculaceae <Ranunculeae>: Ranunculus <Flammula> ambigens
This occurs mostly in or near Appalachian regions and the Ohio River watershed. In Ky. it is rare and largely restricted to older ponds and sloughs in northern regions.

HAB 2 ~ D? 5. **ABU** g8 s5 -3.

0168--Ranunculus laxicaulis (Torr. & Gray) Darby

Ranunculaceae <Ranunculeae>: Ranunculus <Flammula> laxicaulis (texensis)
This occurs mostly on the southeastern Coastal Plain.

HAB 2? ~ D? 5. **ABU** g9? s5? -3.

0169--Ranunculus pusillus Poir.

Ranunculaceae <Ranunculeae>: Ranunculus <Flammula> pusillus
This is a widely scattered southeastern species.

HAB 2 ~: C 6? **ABU** g10 s8 -2.

0170--Ranunculus abortivus L.

Ranunculaceae <Ranunculeae>: Ranunculus <Epirotres> abortivus
This is widespread in humid regions of North America.

HAB 4,7,5 D 3. **ABU** g10 s10 -2.

0171--Ranunculus micranthus Nutt.

Ranunculaceae <Ranunculeae>: Ranunculus <Epirotres> micranthus

This occurs mostly on base-rich soils in east-central states. *R. harveyi* (Gray) Britton is a closely related species expected in Ky. It occurs mostly in relatively dry habitats of the Ozark region, but has disjunctions east to n. Ala, e. Tenn. (Ch), s. Ill. (ML) and s. Ind. (Floyd Co. according to Natural Heritage Database). *R. harveyi* differs in its longer petals (ca. 4-8 mm versus 2-3.5 mm), much exceeding sepals (versus about equaling); also, unclleft basal leaves are subcordate to cordate (versus cuneate to subcordate), rarely mixed with unclleft ones (versus often mixed).

HAB 7,5,11 D 2. **ABU** g10 s10 -2.

0172--Ranunculus allegheniensis Britt.

Ranunculaceae <Ranunculeae>: Ranunculus <Epirotres> allegheniensis
This is restricted to the central and southern Appalachians.

HAB 5,7,11 C 2. **ABU** g8 s7 -1.

0173--Ranunculus flabellaris Raf.

Ranunculaceae <Ranunculeae>: Ranunculus <Hecatonia> flabellaris
This is widely scattered in wetlands of temperate regions across North America,

HAB 2 ~: D? 6. **ABU** g10 s8 -2.

0174--Ranunculus sceleratus L.

Ranunculaceae <Ranunculeae>: Ranunculus <Hecatonia> sceleratus
This is a widespread, weedy species across North America and Eurasia. Plants of eastern North America have somewhat uncertain status but are probably native to the north (F, FNA 3; W).

ALI n. **HAB** 2,9,1 D 5. **ABU** g10 s8 -2.

0175--Ranunculus recurvatus Poir.

Ranunculaceae <Ranunculeae>: Ranunculus <Ranunculus> recurvatus
This is widespread in eastern North America.

HAB 4,5,6,7 D 3. **ABU** g10 s10 -2.

0176--Ranunculus acris L.

Ranunculaceae <Ranunculeae>: Ranunculus <Ranunculus> acris
This European weed is widely scattered across cool, humid, temperate regions of North America.

ALI EU. **HAB** g-10,7 D 4. **ABU** +4.

0177--Ranunculus repens L.

Ranunculaceae <Ranunculeae>: *Ranunculus* <*Ranunculus*> *repens*

This European weed is widely scattered across cool, humid, temperate regions of North America.

ALI EU. **HAB** g-9,6,2 D 6. **ABU** +5.

0178--*Ranunculus bulbosus* L.

Ranunculaceae <Ranunculeae>: *Ranunculus* <*Ranunculus*> *bulbosus*

In North America, this alien has a similar range to the closely related *repens* (PL). Distinction can be difficult without complete collections (FNA 3). In addition to its bulbous-thickened stem bases and lack of stolons, *bulbosus* has sepals reflexed along a well-defined transverse fold 1-3 mm above base (versus spreading, to reflexed from base with age).

ALI EU. **HAB** g-10,9,6? C 5. **ABU** +4.

0179--*Ranunculus carolinianus* DC.

Ranunculaceae <Ranunculeae>: *Ranunculus* <*Ranunculus*> *carolinianus* (*hispidus* var. *nitidus*)

This widespread southern and midwestern diploid (2n = 32) species has been confused with the northern tetraploid species (2n = 64), *R. caricetorum* (F, FNA 3). Both are wetland plants, with distinctive long repent to stoloniferous branches often produced after flowering (especially precocious in *carolinianus*), and they are usually less hairy than their upland relatives, *hispidus* and *fascicularis* (both diploids).

R. carolinianus differs from all these species in its relatively short (ca. 3.5-5 mm long versus 5-11 mm), reflexed sepals (versus spreading or tardily reflexed); and its typically less numerous, larger achenes (ca. 3.7-5 mm long versus 2-4.3 mm), with a wider marginal wing (0.4-1.2 mm versus 0.1-0.2 mm). Despite revision of many Ky. colls. by Duncan (1980) and others, some colls. have remained difficult to identify.

HAB 6,9 C 3? **ABU** g9? s8? -3.

0180--*Ranunculus caricetorum* Greene

Ranunculaceae <Ranunculeae>: *Ranunculus* <*Ranunculus*> *caricetorum* ("septentrionalis", *hispidus* var. *c.*)

Mapping is somewhat tentative since further revision of colls. is desirable; see notes under the frequently confused *carolinianus*. However, plants from rocky river banks of se. Ky, in particular, clearly key to *caricetorum* using recent treatments (e.g. FNA 3).

R. caricetorum is a tetraploid that appears somewhat intermediate between the diploids, *carolinianus* (which is similar in decumbent habit) and *hispidus* (which has relatively small achenes). It may be distinguished from both by its lower leaves "all ternately compound, with petiolulate 2-3-cleft and incised ovate to rhombic large leaflets... and stipules conspicuous, rounded at summit" (F). In the other two species, lower leaves, especially the basal ones, are usually much smaller than upper leaves, merely dentate to 3-cleft, and stipules tend to be less conspicuous.

HAB 6,9 D 3? **ABU** g9? s8? -3.

0181--*Ranunculus hispidus* Michx.

Ranunculaceae <Ranunculeae>: *Ranunculus* <*Ranunculus*> *hispidus* (var. *h.*, *marilandicus*)

This is a relatively hairy species, typical of mesic woods in east-central states. But there are more reliable characters to distinguish it from the closely related wetlands species, *caricetorum* and *carolinianus*; see notes under those names.

HAB 5,4,7 D 2. **ABU** g10 s10 -2.

0182--*Ranunculus fascicularis* Muhl. ex Bigelow

Ranunculaceae <Ranunculeae>: *Ranunculus* <*Ranunculus*> *fascicularis*

This largely midwestern species occurs in relatively dry rocky calcareous woods and glade margins. It appears to be rare in the state, but may be easily confused with *hispidus*. It differs (F, Cr) in the principal leaves being longer than wide (versus about as wide), with "later basal leaves pinnately divided into linear or oblong leaflets or linear-segmented leaflets" (versus "palmately 3-parted or 3-5-divided, their segments or leaflets oblanceolate, obovate to rhombic"). Also, stems and leaves have silky-canescens hairs (versus appressed to spreading). Roots are tuberously thickened, only 1.5-5.5 cm long (versus 8-15 cm). Fruiting heads tend to be smaller (7-11 mm versus 5-8 mm), with a conic receptacle (versus ellipsoid or clavate); and achenes tend to be smaller (2.2-3.2 mm long versus 3-3.5 mm), with a less distinct keel.

HAB 12,10 E 3. **ABU** g9? s5? -3.

0183--*Ranunculus parviflorus* L.

Ranunculaceae <Ranunculeae>: *Ranunculus* <*Echinella*> *parviflorus*

In North America, this alien annual occurs mostly in southeastern states (FNA 3).

ALI EU. **HAB** G-9? ::? C 6. **ABU** +4.

0184--Ranunculus sardous Crantz

Ranunculaceae <Ranunculeae>: Ranunculus <Echinella> sardous
 In North America, this annual alien weed occurs mostly in southeastern states. It has become widespread and locally abundant, especially in damp pastures. It was first collected from Ky. in the 1970s (Faller 1975; Browne & Athey 1976; M).

ALI EU. **HAB** G-9,10 ::: D 6. **ABU** +5.

0185--Adonis annua L. C

Ranunculaceae <Ranunculeae>: Adonis annua (autumnalis)
 This is a cultivated species that has been reported as escaped in several regions of North America. It was collected by Short (1840) in the "barrens of western Kentucky, where it was introduced from a nearby garden"; see also correspondence cited by M. There are no other records from the wild in Ky.

ALI EU.

0186--Myosurus minimus L.

Ranunculaceae <Ranunculeae>: Myosurus minimus
 This diminutive annual is widely distributed across most temperate regions of the globe. It probably originated in western North America, where the genus is most diverse, and may have spread west after settlement (W). However, C.W. Short made collections from CHRI in 1818 (PH) and elsewhere in 1837 (NCU); his first colls. became named M. shortii Raf. in 1819 (M; Short et al. 1833). In Ky. it generally occurs on bare damp ground in cropped fields, or similar places, and it is probably much overlooked.

ALI w. **HAB** H-9 ::: C 6. **ABU** g10 s8? =?

0187--Anemonella thalictroides (L.) Spach

Ranunculaceae <Ranunculeae>: Anemonella [Thalicttrum] thalictroides
 This is widespread in eastern states, but uncommon to rare on the southeastern Coastal Plain (FNA 3; W). It is a monotypic genus, but often combined with Thalicttrum by some authors. Reportedly, 2n = 14 and 42 (Cr).

HAB 5,11,7 C 1? **ABU** g10 s10 -2.

0188--Thalicttrum clavatum DC.

Ranunculaceae <Ranunculeae>: Thalicttrum <Physocarpum> clavatum (mirabile)
 This occurs locally in southern Appalachian regions (Ky. & Va. to Ala. & S.C.) on streambanks and seeping slopes, especially near cliffs. In Ky. it occurs only under sandstone cliffs at the western edge of the Appalachian

Plateaus, and further west at a few disjunct sites along the "Pottsville Escarpment" of the Shawnee Hills.

Most colls. mapped here match the description of T. mirabile Small, but that taxon does not seem to be clearly distinct from clavatum in Ky. The recorded range of mirabile is largely restricted to the Cumberland Plateau, with a concentration in nw. Ala. (FNA 3, K). It has been distinguished only by its shorter achenes (ca. 2.5-4 mm long versus 3-5 mm), which are about equal to the longer stipe (ca. 2.5-3.5 mm versus ca. 1-3 mm) and have a straight upper margin (versus concave). But in Ky. this character is often mixed or intermediate within populations. Walck (2000) found that a population of mirabile in POWE has the same chromosome as reported for clavatum; 2n = 14. Perhaps variety status would be reasonable.

HAB 5 // A 1. **ABU** g9? s8 =.

0189--Thalicttrum dioicum L.

Ranunculaceae <Ranunculeae>: Thalicttrum <Heterogamia> dioicum
 This is widespread in mesic woods of eastern North America, except on the southeastern Coastal Plain.

HAB 5 D 1. **ABU** g10 s10 -2.

0190--Thalicttrum coriaceum (Britt.) Small

Ranunculaceae <Ranunculeae>: Thalicttrum <Heterogamia> coriaceum
 This is restricted to central and southern Appalachians, mostly in mesic to subxeric woods and edges. Its apparent rarity in Ky. is not explained. Glandular plants can be confused with revolutum, which has leaflets usually with 1-3 lobes; leaflets of coriaceum usually have 4-6 lobes. The bright yellow roots of coriaceum are also distinctive (FNA 3; W).

HAB 5,11,7? C 3? **ABU** g6? s3? -2.

0191--Thalicttrum revolutum DC.

Ranunculaceae <Ranunculeae>: Thalicttrum <Leucocoma> revolutum
 This is widespread on base-rich uplands in eastern North America, and there are scattered disjunct southwestern records (FNA 3, K). In Ky. there has been much some confusion with pubescens and other species; occasional plants of revolutum can lack its distinctive glands (FNA 3, W). T. revolutum flowers relatively early (May-Jun versus Jun-Jul), and its leaves have a distinctive "skunky" smell. Some Appalachian records should be rechecked; see also note under coriaceum.

HAB 7,11,10 D 4. **ABU** g10 s9 -3.

0192--*Thalictrum dasycarpum* Fisch. & Avé-Lall.

Ranunculaceae <Ranunculeae>: *Thalictrum* <Leucocoma> *dasycarpum*
This is a widespread variable polyploid (2n = 168) of midwestern regions, usually in wet meadows, shores or streambanks (FNA 3, K). There are several records from s. Ill., s. Ind and s. Ohio (especially along the Ohio River, A. Cusick, pers. comm.), but *dasycarpum* appears to have become rare in Ky., with virtually no records after 1970. It has often been misidentified as the eastern species, *revolutum* (2n = ca. 134) or *pubescens* (2n = 84, 126, 154), with which it may intergrade (FNA 3).

Compared to *pubescens*, flowers of *dasycarpum* are rarely bisexual (versus often so). Its anthers are usually longer (1-3.6 (4) mm versus 0.5-1.5 (2.1) mm), and strongly apiculate (versus blunt or slightly apiculate), with filaments filiform and drooping (versus rigid, prominently clavate, ascending). Achenes have a beak that is more or less straight, about as long as the body (versus straight to distally coiled, about half as long), and an obtuse, sessile to subsessile base (versus narrowed, stipitate). Also, leaves of "western plants [are] occasionally glabrous" but typical *pubescens* is minutely puberulent (Cr, W).

HAB 9,2,1 D? 4. **ABU** g8? s5? -5.

0193--*Thalictrum pubescens* Pursh

Ranunculaceae <Ranunculeae>: *Thalictrum* <Leucocoma> *pubescens* (*polygamum*, *perelegans*)

This variable northeastern species is centered in Appalachian regions (FNA 3, K). In Ky. is widely scattered in low alluvial woods, thickets and edges near streams, but it appears to have largely disappeared from more agricultural regions. Colls. from the Bluegrass region were mostly made before 1950. *T. pubescens* can easily be confused with *dasycarpum*, as detailed under that name; see also W.

HAB 4,6,1 C 3. **ABU** g9? s9 -3.

0194--*Anemone virginiana* L.

Ranunculaceae <Anemoneae>: *Anemone virginiana*

This is a widespread eastern species. Records of the related western and northern species, *A. cylindrica* Gray, appear to have been erroneous in Ky. (M) and Tenn. (Ch).

HAB 8,7,5 D 3. **ABU** g10 s10 -2.

0195--*Anemone caroliniana* Walt. R

Ranunculaceae <Anemoneae>: *Anemone caroliniana*

This largely midwestern tuberous species was listed for west-central Ky. by Hussey (1876) and Linney (1880, 1882). However, no colls. of these early geobotanical explorers have been located. The species is known from se. Mo., c. Tenn. and other disjunct localities in southeastern states (FNA 3; W).

0196--*Anemone blanda* Schott & Kotschy R

Ranunculaceae <Anemoneae>: *Anemone blanda*

This European species is widely cultivated in flower gardens, but there are only a few records of persisting or escaping plants in northeastern North America (FNA 3). A reported coll. from SHEL (see also PL) has not been located (at EKY or elsewhere).

ALI EU.

0197--*Anemone canadensis* L.

Ranunculaceae <Anemoneae>: *Anemone canadensis*

This rhizomatous species is widespread in damp meadows and shores of northern regions, but has disappeared from Ky. There are only old records from FAYE (C.W. Short, PH, "on Elkhorn near Lex[ington]" and BOON (Nelson 1919), plus a doubtful recent record from HARD (cited in M). *A. canadensis* does survive in s. Ohio, s. Ind., and s. Ill., within 50 miles of Ky. at several sites, especially in the Wabash Rv. valley of sw. Ind. and se. Ill. (D, K, PL).

HAB 6,9,1 D? 4? **ABU** g10 s0 -6.

0198--*Anemone quinquefolia* L.

Ranunculaceae <Anemoneae>: *Anemone quinquefolia*

This variable northeastern species forms colonies with slender rhizomes. Distinction of the hairier var. *bifolia* Farw. (= var. *interior* Fern.) is not clearcut, and there appears to be little or no geographic separation in Ky., but further study may be warranted. See also *lanceolata*.

HAB 5,4 B 1. **ABU** g10 s7 -1.

0199--*Anemone lancifolia* Pursh

Ranunculaceae <Anemoneae>: *Anemone lancifolia* (*quinquefolia* var. 1.)

This taxon is known mostly in the Blue Ridge Mountains, from Va. to S.C. It was not mapped for Ky. by FNA 3, but there are colls. here by B (US), M (WKY) and others (EKY) from the Cumberland Mountains or nearby. It is

sometimes treated as *A. quinquefolia* var. *lancifolia* (Pursh) Fosberg, since there can be intergradation in zones of overlap.

HAB 4,5 B 2? **ABU** g8? s4? -1.

0200--*Hepatica acutiloba* DC.

Ranunculaceae <Anemoneae>: *Hepatica* [*Anemone*] *acutiloba* (nobilis var. *acuta*)

This is widespread in eastern North America, except on the southeastern Coastal Plain. See W for notes on taxonomic choices and habitats for the two *Hepatica* species.

HAB 5 D 1. **ABU** g10 s10 -2.

0201--*Hepatica americana* (DC.) Ker-Gawl.

Ranunculaceae <Anemoneae>: *Hepatica* [*Anemone*] *americana* (nobilis var. *obtusa*)

This occurs widely in eastern North America, but centered in northeastern and Appalachian regions. It is close to *acutiloba*, but intermediate or hybrid plants are not well documented. It generally occurs on more acid, infertile soils, without base-rich seepage.

HAB 5 C 1. **ABU** g10 s9 -1.

0202--*Clematis terniflora* DC.

Ranunculaceae <Anemoneae>: *Clematis terniflora* (*dioscoreifolia*, *paniculata* var. *d.*)

This alien vine has been widely planted and escaped in southeastern states (FNA 3). It spreads vegetatively and persists in abandoned gardens; it may also establish from seed (CW).

ALI AS. **HAB** 7,10 D 4. **ABU** +5.

0203--*Clematis catesbyana* Pursh

Ranunculaceae <Anemoneae>: *Clematis catesbyana*

This has a highly fragmented southeastern range, with concentrations on calcareous soils, including c. Tenn. (C h, FNA 3, K, W). It is similar to the more widespread eastern species, *virginiana*, and has probably been overlooked in c. Ky. (D. Estes, pers. comm.). *C. catesbyana* differs in its more divided, pinnate to bipinnate leaves, with 5-7 distinct leaflets (versus 3), and its less numerous carpels per flower (18-35 versus 40-60). The only accessed Ky. coll. is from WARR: K. Nicely & Gough #3069 (NCU, WKY).

HAB 7,10 E? 4. **ABU** g7 s2 -4?

0204--*Clematis virginiana* L.

Ranunculaceae <Anemoneae>: *Clematis virginiana*

Although widespread in eastern and central North America, this species may be relatively infrequent on more fertile base-rich soils. In Ky. it appears rare to absent in counties near the Ohio Rv. downstream of Appalachian regions. Mapped records include var. *missouriensis* (Rydb.) Palmer & Steyermark from HEND (KY-Agr.); that variety is not distinguished in recent treatments.

HAB 7,10 C 4. **ABU** g10 s10 -2.

0205--*Clematis crispa* L.

Ranunculaceae <Anemoneae>: *Clematis* <*Viorna*> *crispa*

This occurs on lowlands in southeastern states.

HAB 9,3,2 C 4. **ABU** g8? s4? -3.

0206--*Clematis viorna* L. {eastern/smooth variant}

Ranunculaceae <Anemoneae>: *Clematis* <*Viorna*> *viorna* {eastern/smooth variant; "glaucophylla"}

These plants occur in largely non-calcareous Appalachian regions from W.Va. to Ala. and perhaps in the Ozarks of Ark. and Mo., mostly along rocky banks of larger streams and rivers. They differ from the variant of *viorna* in more calcareous regions as follows: sepals thinly hairy, especially when young, or glabrate (versus densely hairy); leaves glabrous on lower surface or nearly so, except for scattered hairs along veins (versus uniformly hairy); leaves, at least low on stem, mostly ternate or compound with 4-8 leaflets, these usually ovate to lanceolate with elongated acute-acuminate apices (versus variable but often less divided and elongated); stems more or less hairy near nodes, but thinly hairy to glabrous in general (versus uniformly hairy). Leaves are often relatively deep bluish-green, with a rather pale bluish sheen below, but not distinctly whitish-glaucous.

The name *C. glaucophylla* Small has been applied to these plants using the treatments of Sm, F, RAB, J, W and others, but this is incorrect (FNA 3; D. Estes, pers. comm.). The name *C. viorna* var. *viorna* may be appropriate, but further research is needed. Some southern plants in Ky., with relatively broad, paler green, subreticulate leaflets, or with relatively small flowers, may resemble the obscure taxa described by Sm., *C. beadlei* and *C. gattingeri*.

HAB 1,4,6 C 4. **ABU** g8? s7 -1.

0207--*Clematis viorna* L. {widespread/hairy variant}

Ranunculaceae <Anemoneae>: Clematis <Viorna> viorna {widespread/hairy variant; + flaccida}

These plants are known mostly from rocky base-rich soils in and around the Appalachians, being largely replaced by versicolor to the south and west. They mostly have relatively hairy lower leaf surfaces and outer sepal surfaces. However, there are transitions to the more strictly Appalachian variant of non-calcareous regions (see above).

The names *C. gattereri* Small or *C. viorna* var. *flaccida* (Small) Erickson may be appropriate for these plants, but types need to be reexamined (D. Estes, pers. comm.). Some of the more disjunct western and southern colls. mapped here may resemble other variants found in southern foothills from S.C. to Ala. (including *Viorna beadleii* Small) and Ala. to e. Tex. (including *V. subreticulata* Harbison). These include colls. from TRIG and Montgomery Co., Tenn. (ASPU) with relatively broad, thinly hairy, more or less subreticulate leaflets. Such plants may appear intermediate between *C. viorna* and *C. reticulata* (Walt.) Small, which is known largely from the Coastal Plain but not confirmed in Ky. or Tenn. (Sm, Ch, W, FNA 3).

HAB 11,5 D 4. **ABU** g9 s9 -2.

0208--Clematis pitcheri Torr. & Gray

Ranunculaceae <Anemoneae>: Clematis <Viorna> pitcheri
This largely Ozarkian species does occur locally in w. Ky. and w. Tenn. (Ch). It has sometimes been confused with *crispa* or *viorna*, especially without good colls. of flowers or fruits.

HAB 6,4,1? C 4? **ABU** g8? s5? -3.

0209--Clematis glaucophylla Small ? T

Ranunculaceae <Anemoneae>: Clematis <Viorna> cf. *glaucophylla*
This species is known mostly from scattered localities in e. Miss., Ala., Ga. nw. Fla. and se. Tenn. There is a need to collect more complete material and fresh flowers from some localities in Ky., as well as the disjunct plants that have been referred to *glaucophylla* from n. La., s. Ark. and se. Okl. (FNA 3; see colls. at MO). Better descriptions and keys are needed.

True *glaucophylla* may not occur in Ky., but the name has been misapplied to some forms (or potential segregates) of *versicolor* and *viorna*. Records mapped here as *versicolor* from BARR, CARL and WARR are based on old colls. of S. Price (MO) and D. O'Dell & D. Windler (Southern Illinois Univ.) that have been determined as *glaucophylla* based on leaflet texture, following

Erickson (1943) and FNA 3. However, Estes (2006; and pers. comm.) doubts these identifications. He has found that fresh sepals of *glaucophylla* are consistently darker: "cherry red to reddish-purple" (versus "purplish-red to bluish-lavendar, creamy or greenish distally" in *versicolor*). Its leaflets are relatively thin (versus usually thick, leathery and prominently reticulate); proximal leaflets are often lobed or trifoliate (versus mostly unlobed, occasionally 2-3-lobed).

0210--Clematis versicolor Small ex Rydb.

Ranunculaceae <Anemoneae>: Clematis <Viorna> *versicolor*
This occurs in scattered calcareous localities from the southern Ridge & Valley to the Ozarks, and perhaps further south (FNA 3). In Ky. early reports of the more southern species, *C. reticulata* Walt. (Short et al. 1833, M), were probably based on misidentified *versicolor*. See also notes under *Clematis* cf. *glaucophylla*.

HAB 11,12 D 4. **ABU** g8? s5? -2.

0211--Dicentra eximia (Ker Gawl.) Torr. R

Fumariaceae [Papaveraceae]: *Dicentra eximia*
This diploid (2n = 16) has showy pink panicles and lacks bulblets. It is endemic to the east-central Appalachians, and occurs within 20-50 miles of the state line in W.Va., Va. and Tenn. R. Cranfill (pers. comm.) has found plants that might be native at Pine Mt. State Park (BELL). However, it is possible that people have transplanted this species into Ky. Also, *D. formosa* (Howarth) Walpers is a species of Pacific coastal regions that has been widely cultivated and artificially hybridized with *eximia*.

The related northeast Asian species, *Lamprocapnos spectabilis* (L.) Fukuhara (= *Dicentra spectabilis*) is also cultivated and may escape to a limited degree. There is a coll. of *L. spectabilis* from CALL (MUR) that might be from an escaped plant.

0212--Dicentra cucullaria (L.) Bernh.

Fumariaceae [Papaveraceae]: *Dicentra cucullaria*
This tetraploid (2n = 32) occurs widely in eastern North America, except on the southeastern Coastal Plain.

HAB 5 D 1. **ABU** g10 s10 -3.

0213--Dicentra canadensis (Goldie) Walp.

Fumariaceae [Papaveraceae]: *Dicentra canadensis*

This octaploid ($2n = 64$) occurs mostly in east-central states from upper midwest to Appalachian regions and New England. It tends to grow in more fertile soil than cucullaria, often with more disturbance from flooding or animals. Leaves tend to be more bluish-green and glaucous (versus somewhat yellow-green, not glaucous).

HAB 5,4 D 1. **ABU** g10 s10 -4.

0214--*Adlumia fungosa* (Ait.) Greene ex B.S.P.

Fumariaceae [Papaveraceae]: *Adlumia fungosa*

This is rare through much of its northeastern range, at least in the southern Appalachian extensions. In Ky. it is known only from a few old records in the Cumberland Mountains; the last may have been in 1984. It is an extraordinary biennial herbaceous vine of rocky woods, usually on sandy soils. Some records suggest association with fire or other disturbance.

HAB 5,7,8 +/-? C 3. **ABU** g7 s2 -4?

0215--*Capnoides sempervirens* (L.) Borkh.

Fumariaceae [Papaveraceae]: *Capnoides* [*Corydalis**] *sempervirens*

This is widespread in boreal regions of North America, and extends south on rocky sites in the higher Appalachians. Its monotypic genus is closer to *Dicentra* and *Adlumia* than *Corydalis* (Lidén et al. 1997; W).

HAB 12,10 +/-? B 4? **ABU** g10 s6 -1.

0216--*Corydalis flavula* (Raf.) DC.

Fumariaceae [Papaveraceae]: *Corydalis flavula*

This occurs mostly in east-central states from Appalachians to Ozarks. The largely midwestern *C. micrantha* (Engelm.) Gray has not been reported but may be expected since disjunct populations occur in Tenn. and North Carolina (FNA 3, W). It has distinctly larger flowers, but variation in flower size, cleistogamy and seed characters can be confusing within the genus. Further study of colls. is desirable.

HAB 7,4,5,11 D 2. **ABU** g10 s10 -2.

0217--*Sanguinaria canadensis* L.

Papaveraceae: *Sanguinaria canadensis*

This monotypic genus is widespread in mesic woods of eastern North America, but concentrated on base-rich soils. In the central Bluegrass, Short (1828-9) noted: "No plant is more commonly met with in early spring, in this vicinity, than the puccoon, by which name it is universally recognised.

Perhaps no wild plant better deserves cultivation than this... highly medicinal,

being emetic, expectorant and escharotic. It prefers rich, moist, shaded woods, and in such situations it is every where abundant in the spring..." *Sanguinaria* has apparently declined much in this region, being now largely restricted to rocky ravines near larger watercourses.

HAB 5,7,4 E 1. **ABU** g10 s10 -2.

0218--*Stylophorum diphyllum* (Michx.) Nutt.

Papaveraceae: *Stylophorum diphyllum*

This species occurs mostly in east-central states from the Ridge-and-Valley to the Ozarks (K); the only two congeners occur in central China (Flora of China 7: 284). Its range is somewhat fragmented, at least partly due to concentration in mesic woods on base-rich soils. Also, its abrupt western boundaries in sw. Ky. and sw. Tenn. suggest that past disturbances (perhaps frequent droughts and fires) may have restricted spread. In the central Bluegrass, Short (1828-9) noted: "This handsome plant, so abundant on the borders of the Ohio river, is comparatively rare in this neighbourhood ...in rich shaded situations."

HAB 5,4 E 1. **ABU** g9 s9 -3.

0219--*Chelidonium majus* L. C

Papaveraceae: *Chelidonium majus*

This cultivated alien rarely persists or spreads there are scattered records from the Bluegrass region (BOON, FAYE, SCOT).

ALI EU.

0220--*Argemone albiflora* Hornem. C

Papaveraceae: *Argemone albiflora*

This southeastern weedy species ("prickly poppy") may just be a rare escape from cultivation or adventive waif, and it is probably not persistent (J,W). It occurs mostly in open sandy sites on the Coastal Plain. There is a coll. from FAYE (Ky.-Agr.). The more tropical species, *A. mexicana* L., may also be expected as a waif or escape.

ALI S.

0221--*Papaver rhoeas* L.

Papaveraceae: *Papaver rhoeas*

In Ky. this common Eurasian "poppy" is just be an occasional waif or escape from cultivation.

ALI EU. **HAB** H-10 :::: E 6. **ABU** +4.

0222--*Papaver dubium* L.

Papaveraceae: *Papaver dubium*

This is a variable hexaploid ($2n = 42$) that is closely related to *rhoeas* ($2n = 14$), and appears to intergrade in some areas (FNA 3).

ALI EU. **HAB** H-10 :::: E 6. **ABU** +4.

0223--*Nelumbo lutea* (Willd.) Pers.

Nelumbonaceae: *Nelumbo lutea* (pentapetala)

This spectacular yellow-flowered aquatic with large, round, peltate leaves is widely scattered in eastern states, Mexico and West Indies. Rafinesque (1836, 1:31-32) suggested that this species was spread to the north by Indian tribes; rhizomes and seeds can be eaten.

In Ky. it was listed for the Louisville area (JEFF) by McMurtrie (1819). Short (1836, 1837) knew of only three sites in Ky.: (1) "a pond in the Barrens" (perhaps CHRI); (2) "a pond on the borders of Jessamine county, within six miles of Lexington"; and (3) "On the Ohio river, a hundred miles north of Lexington... a shallow basin of 50 acres or so..." (see also his notes on seeds). A fourth record comes from Robert Peter in letter to E. Durand, August 19th, 1834; [Transylvania College]: "*Nelumbium luteum* grows in the river Kentucky, in a pond on the margin of the river, 4 or 5 miles above Frankfort, on the north side--on the right bank..."

Currently, *N. lutea* occurs mostly in large, old natural ponds and lakes, especially in western regions, and it rarely spreads to smaller ponds without the hand of man. Plants in JEFF, JESS and elsewhere may result from artificial introductions. The pink- or white-flowered Asian species, *N. nucifera* Gaertn. (the "sacred Indian lotus"), is also cultivated occasionally, and might persist or escape in ponds (J).

ALI s. **HAB** 2 ~ D? 5. **ABU** g10 s8 -3?

0224--*Platanus occidentalis* L.

Platanaceae: *Platanus occidentalis*

Although this widespread eastern tree is distributed across Ky., it was probably much more restricted to riparian zones before clearance of the land. Barton's (1919) data indicate that it was most common on western and southern lowlands; also along the upper Licking Rv. and upper Ky. Rv. It was not a significant component of original woodland across the Bluegrass region (Campbell 1989), where riparian zones were apparently dominated by box-elder (*Acer negundo*) instead.

HAB 4,6,7,1 D 4. **ABU** g10 s10 +1.

0225--*Pachysandra procumbens* Michx.

Buxaceae: *Pachysandra procumbens*

This unusual conservative species of mesic woods is concentrated in parts of the southern Interior Low Plateaus and Cumberland Plateau, but with curious extensions and disjunctions in some adjacent regions (K, PL). Though close to old dwellings, the few disjunct populations along the Kentucky River Palisades appear to be native; Short (1828-9) noted *Pachysandra* in FAYE. Further discoveries may be expected to in n. Ky., since it is known from a few sites in s. Ind. (Indiana Dept. of Natural Resources database). However, the one site in e. Mo. may have been introduced (Y).

HAB 5 D 1. **ABU** g8 s8 -2.

0226--*Paeonia officinalis* L. C

Paeoniaceae: *Paeonia officinalis*

This southern European species is widely cultivated and sometimes persists. A coll. from BELL (BEREA) is reported to come from a spontaneous plant on an abandoned mine, but an old homesite is possible. The related species, *P. laetiflora* Pallas can also persist at old home sites (e.g. in OLDH, with coll. at DHL). These species are generally not reported to naturalize in eastern North America (F, Cr, W; FNA 8), but they have been mapped by K and PL as wild plants in some northeastern regions.

ALI EU.

0227--*Hamamelis virginiana* L.

Hamamelidaceae: *Hamamelis virginiana*

This fall- to winter-flowering shrub is a widespread eastern species, but generally uncommon to rare on more fertile base-rich soils. Rafinesque (1836, 3:16) described *estivalis*: a "small shrub 3 or 5 feet high growing in West Kentucky and probably further west also, near streams, but blossoming in July when in full leaf; these leaves are thin and not leathery [as in *virginiana*]... Discovered in 1818 and 1823." His notes suggest some similarity to *H. vernalis* Sarg., a species of Ozarkian streams that flowers in spring (St). However, no further evidence has appeared for a distinct taxon of this type in Ky.

HAB 7,11,4,1 C 3. **ABU** g10 s10 -2.

0228--*Liquidambar styraciflua* L.

Altingiaceae [*Hamamelidaceae*]: *Liquidambar styraciflua*

This southeastern tree is virtually absent in glaciated land north of the Ohio River. And although widespread in Ky., Liquidambar is rare to absent on base-rich soils, especially in the Bluegrass Region where it is confined to more acid river terraces. See AP and W for recent references to family placement.

HAB 6,9,7,4 C 2. **ABU** g9 s9 -3.

0229--Itea virginica L.

Iteaceae [Saxifragaceae*]: *Itea virginica*

This small shrub occurs across southeastern states, usually in thin woods and streambanks on wet acid soils.

HAB 6,1 C 3. **ABU** g9 s8 -2.

0230--Ribes cynosbati L.

Grossulariaceae [Saxifragaceae]: *Ribes* <*Grossularia*> *cynosbati*

This is widely scattered in rocky mesic to subseric woods of northeastern regions. Leaf pubescence varies greatly, but the glabrate plants of some Appalachian regions, known as var. *glabratum* Fern., have not been documented in Ky. (F). See notes under *missouriense*, which is easily confused. Yet natural hybrids are virtually unknown among these or other native species of *Ribes*, despite generally consistent chromosome number; $2n = 16$ in most cases.

HAB 5,11 D 3. **ABU** g9 s8 -2.

0231--Ribes missouriense Nutt.

Grossulariaceae [Saxifragaceae]: *Ribes* <*Grossularia*> *missouriense* (*gracile*)

Without flowers or fruits, this small midwestern shrub is hard to distinguish from *cynosbati* (F, Cr), and a few identifications remain tentative. Leaves of *missouriense* tend to be smaller (ca. 1.5-3.5 cm across versus 2-5 cm), more deeply lobed (with sinuses extending well beyond half way to the middle), and less hairy (especially on upper surfaces). Also, its spines tend to be longer (ca. 7-17 mm versus 5-10 mm). It may increase in woods subject to browsing (FNA 8, Y).

HAB 11,12,7 E 4. **ABU** g8 s7 -1.

0232--Ribes rotundifolium Michx. R

Grossulariaceae [Saxifragaceae]: *Ribes* <*Grossularia*> *rotundifolium*

This occurs in Appalachian regions mostly at high elevation, and might be expected in the Cumberland Mts. but no coll. has been verified. Records by Linney (1882), RAB and others (M) may all be based on misidentified

missouriense, including a vegetative coll. from CAMP (NCU): E.T. Browne #4258.

0233--Ribes uva-crispa L. var. sativum DC. C

Grossulariaceae [Saxifragaceae]: *Ribes* <*Grossularia*> *uva-crispa* var. *sativum* (*grossularia*)

These commonly cultivated plants ("goose-berry") may sometimes persist in abandoned gardens, but they are probably not truly naturalized. There is a coll. from a fencerow in OLDH (DHL).

ALI EU.

0234--Ribes americanum P. Mill.

Grossulariaceae [Saxifragaceae]: *Ribes* <*Ribesia*> *americanum* (*floridanum*)

This is a northern species that is probably delivered south occasionally by avian means. In addition to recent colls. of G. Libby from MADI (EKY) and R. Clark from LEE (EKY), there are old records of C.W. Short from BATH (PH; see M) and Nelson (1919) from BOON. Allied species in the "currant" group may be expected (J), especially *R. odoratum* H.H. Wendl. (= *R. aureum* var. *villosum* of FNA 8), which has a northwestern range but was recently discovered in adjacent w. Tenn., apparently native (Ch; D. Estes, pers. comm.).

HAB 7,4,6? D? 3. **ABU** g10 s2? -2?

0235--Hydaticea petiolaris (Raf.) Small

Saxifragaceae: *Hydaticea* [Saxifraga*] *petiolaris* (*Micranthes* p.; *S. michauxii**, *leucanthemifolia*)

This is endemic to the southern Appalachians. Records from MCRE and PULA are tentatively based on inadequate colls., but detailed in reports to Daniel Boone National Forest (Campbell et al. 1994). M.S. Lanning (2009, M.S. thesis, Western Carolina Univ.) and W have recently supported the generic placement of Sm that is followed here.

HAB 5,11 // B 2. **ABU** g9 s3? -1.

0236--Micranthes virginensis (Michx.) Small

Saxifragaceae: *Micranthes* [Saxifraga*] *virginensis*

This occurs in rocky mesic woods across much of eastern North America, except the southeastern Coastal Plain and midwestern plains. It is centered in Appalachian regions (K). *M. virginensis* has a range of reported chromosome numbers; $2n = 20-28$ and 38 (FNA 8). However, segregates are not currently

recognized in Ky. See FNA 8 and W for references to recent research on generic assignments within *Saxifraga*, sensu lato.

There have been reports from Ky. of two closely related southern Appalachian species (FNA 8, RAB): *M. caroliniana* (Gray) Small and *M. careyana* (Gray) Small. Recent revision has indicated that these are recorded close to Ky. in the Ridge and Valley region of Tenn., Va. and W.Va. But the reports from within Ky. remain dubious (M, W and citations).

HAB 5 +\ D 2. **ABU** g9 s9 -1.

0237--*Micranthes micranthidifolia* (Haw.) Small

Saxifragaceae: *Micranthes* [*Saxifraga**] *micranthidifolia*

This diploid (2n = 22) is endemic to the central and southern Appalachians, mostly at higher elevations. In Ky. the only verified records are from Black Mt. or nearby (HARL, LETC). For JACK, there is only a sight record of L. Pounds (pers. comm.) ca. 1980, from a "spring fed creek along War Fk near Turkey Foot Campground."

HAB 1,6? ::? A 3? **ABU** g8 s3? -1.

0238--*Micranthes pensylvanica* (L.) Haworth

Saxifragaceae: *Micranthes* [*Saxifraga**] *pensylvanica*

This polyploid is widespread in northeastern wetlands; 2n = 56, 84 and 112 (FNA 8). It was collected by C.W. Short (PH) ca. 1830: "muddy thicket, Henderson Co., Ky., near Mr. William Greers, fl. 10th May. The only place I have seen it."

HAB 6,9 ::? C? 3? **ABU** g8 s1 -6?

0239--*Tiarella cordifolia* L.

Saxifragaceae: *Tiarella cordifolia*

This is widespread in mesic woods on medium acid soils of northeastern and Appalachian regions (K, W). It is rare to absent on calcareous soils. In Ky. most colls. from west of Appalachian regions appear valid, but the coll. from WOOD (KY) was made by a student with a possible label error.

Variation needs further study. Some plants in southeastern states have been segregated as var. *collina* Wherry or var. *austrina* Lakela, but their status remains uncertain; both taxa have been placed by some authors within a distinct species, *T. wherryi* Lakela (Lakela 1937; FNA 8, W and citations). Var. *collina* is distinguished by its lack of stolons and its smaller capsules.

Var. *austrina* was reported from BATH, BELL and HARL by Lakela, but it may not be separable from var. *collina*.

Tiarella, *Heuchera* and *Mitella* are closely related genera; 2n = 14 in all eastern species (as in *Sullivantia* and *Boykinia*). All three genera contain some stoloniferous plants, but in eastern North America only *T. cordifolia* is usually stoloniferous (Cr, FNA 8). Hybrids of *Tiarella* and *Heuchera* have been developed in cultivation. Hybridization and chloroplast transfer among species of *Heuchera* appears to have played a significant role in their evolution (FNA 8 and their citations).

HAB 5 B 1. **ABU** g9 s9 -1.

0240--*Heuchera hispida* Pursh ? R

Saxifragaceae: *Heuchera* <Americanae> cf. *hispida* (?*americana* x *pubescens*; *americana* var. h.)

This appears to be somewhat intermediate between *americana* and *H. pubescens* Pursh (FNA 8, W). It differs from typical *americana* in its large flowers, with free hypanthium 1.5-1.9 mm long (versus < 1.5 mm), its generally purplish, fimbriate petals (or perhaps paler in Pa.; see GH), and its generally glabrous leaves. Although it is concentrated in or near the Ridge-and-Valley region, like typical *pubescens*, there may be outlying colls. from Ohio (Scioto Co., GH), Ky. (BA, MEM to be checked), and even Ark. (Montgomery Co., GH).

H. pubescens (sensu lato) is a large-flowered species of the east-central Appalachians (in Pa. to N.C.) that has been reported from Ky. (M) and Tenn. (Ch) by various authors before 1950, but not Wells (1984; FNA 8). These reports include references to the dubious segregate, *H. pubescens* var. *brachyandra* Rosend., Butt. & Lak. (with stamens included or barely exerted), and to the more distinct segregate, *H. alba* Rydb. (with relatively large white petals). Some of these reports result from misidentified colls. of *longiflora* (e.g. B's colls. at GH or US; Wells 1984). However, there is an old mysterious coll. at GH that appears close to typical *pubescens*, with "Kentucky" written directly on the sheet (also "*Heuchera reniformis* Raf." and "Raf. in *H. Durand*"). Moreover, there does appear to be a broad zone of introgression between *americana* and *pubescens*.

0241--*Heuchera longiflora* Rydb.

Saxifragaceae: *Heuchera* <Americanae> *longiflora* (aceroides)

This relatively distinct, large-flowered species occurs mostly on sedimentary rocks of diverse type in the central-southern Appalachian Plateaus (Ala., Tenn., Ky., Ohio, W.Va., Va.) and in some adjacent regions. In Ky. it is confined to acid soils on sandstones and shales, but locally frequent in some Appalachian regions. (FNA 8 states erroneously that *longifolia* "is restricted to limestone outcroppings and rare in all the states where it is found.")

The disjunct western colls. mapped here from EDMO and WARR (WKY) are somewhat distinct in having strigose upper leaf surfaces (versus thinly strigose to completely glabrous), and pubescent veins below (versus thinly hispid to glabrous). These plants might deserve variety status, but a broader revision of this species across its range is needed. The disjunct population around Hot Springs in N.C. also includes relatively hairy plants (MO), and occurs mostly on base-rich soils (W).

HAB 5 + C 2. **ABU** g8 s8 -1.

0242--*Heuchera americana* L. var. nov. {glabrate-leaved variant}

Saxifragaceae: *Heuchera* <Americanae> *americana* var. nov. {glabrate-leaved variant}

These Appalachian plants differ from typical *americana* in having almost completely glabrous leaves, except for their ciliate margins and minutely glandular-puberulent petioles; there may also be subtle differences in texture and color. In contrast, var. *americana* generally has hairs on both leaf surfaces (strigose above), although either surface can be thinly hairy or glabrate in some cases. The plants mapped here deserve further study for potential description as a new variety.

At GH, there are colls. of similar plants from DC. Ga., N.C., S.C., Tenn. and Va. The name "*Heuchera glauca* Raf." is written on a few of the older colls., and should be researched further; the type remains unknown (Wells 1984). *H. americana* var. *hispidula* (Pursh) Wells also has generally glabrous leaves, but its larger flowers with purple petals are distinct; for more notes see *H. pubescens*.

HAB 5,11 + C 2. **ABU** g8? s8 -1.

0243--*Heuchera americana* L. var. *americana*

Saxifragaceae: *Heuchera* <Americanae> *americana* var. a.

This occurs mostly in east-central states. Most material from Ky. may be referable to var. *brevipetala* Rosend., Butt. & Lak., but that taxon is not

generally recognized in recent treatments. B noted apparent hybrids with *H. longiflora* from LETC (check US).

HAB 5,11 + D 2. **ABU** g9 s9 -2.

0244--*Heuchera americana* L. var. *hirsuticaulis* (Wheelock) Rosendahl, Butters & Lakela

Saxifragaceae: *Heuchera* <Americanae> *americana* var. *hirsuticaulis* (interior) This midwestern taxon is considered by some authors (e.g. Wells 1984, Cr, FNA 8) to have resulted from introgression with the more western species, *H. richardsonii* R. Br. It was not recorded from Ky. by Wells, but the identification of colls. mapped here is confirmed. However, the coll. from MAD1 (BEREA) may be misleading; it comes from cultivation of buried seed, "with forced flowering" (R. Thompson & Wade #87-2033), and its origin is unclear.

HAB 5,11 + D 2. **ABU** g8 s8 -2.

0245--*Heuchera villosa* Michx.

Saxifragaceae: *Heuchera* <Villosae> *villosa* (var. v.)

This occurs mostly in or near the southern Appalachians, in mesic rocky woods. Plants mapped here include those formerly known as var. *intermedia*; but see also *H. macrorhiza*.

HAB 5 + C 2. **ABU** g8 s8 -1.

0246--*Heuchera macrorhiza* Small

Saxifragaceae: *Heuchera* <Villosae> *macrorhiza* (*villosa** var. m.)

This deserves recognition as a species, although often combined with the largely Appalachian *villosa* (e.g. FNA 8). *H. macrorhiza* is largely restricted to calcareous cliffs in the Interior Low Plateaus. F stated that var. *intermedia* Rosend., Butt. & Lak. "is possibly recognizable", as an intermediate. However, in Ky. virtually all colls. of *macrorhiza* are distinct from typical *villosa*. The coll. from CALL (MUR) was initially misidentified as *H. missouriensis* Rosendahl (see notes under *H. puberula*).

H. macrorhiza differs from typical *villosa* (Small 1898, F, W) in its relatively short, broad bractlets, which are densely long-ciliate (versus narrowly lanceolate to subulate, glabrous to thinly ciliate); bracts are oblong to spatulate, and at least the lower ones toothed (versus linear, mostly entire); its stems are "shaggily" villous (versus loosely); leaves are hirsute below, with long soft hairs along veins (versus glabrous to thinly hairy, with appressed stiff hairs along veins); leaf lobes are all shallow, much broader than long

(versus deep and sharp, especially the terminal); rhizomes are ca. 1-2 cm thick (versus 5-9 mm).

HAB 5,11 || E 2. **ABU** g8 s8 =.

0247--Heuchera parviflora Bartl.

Saxifragaceae: *Heuchera* <Villosae> *parviflora* (var. p., *rugelii*)

This largely Appalachian species is probably unknown west of the Shawnee Hills in Ky. and Ind., where it is restricted to sandstone cliffs. But see notes under *H. puberula*. The coll. from MERC (EKY) is verified, and would be the only record from limestone in Ky., if label data are correct. Most colls. from Ky. appears to match var. *rugelii* (Shuttlw.) Rosend., Butt. & Lak., which has less hairy leaves, but that taxon was not recognized by Wells (1984) or in most other recent treatments.

HAB 5 // A 1. **ABU** g8 s8 =.

0248--Heuchera puberula Mackenzie & Bush

Saxifragaceae: *Heuchera* <Villosae> *puberula* (*parviflora** var. *puberula*)

This species of the Ozarks and Shawnee Hills has been confused with typical *parviflora*, which is largely Appalachian (Sm, F, St, FNA 8). Further revision is needed; variety status may be preferable. *H. puberula* differs from *parviflora* in its longer capsules (4.2-5.5 mm versus 3-4.5 mm), longer fresh calices (2-4 mm versus 1.5-2 mm); and its petioles and flowering branches are puberulent (versus villous). It is often reported from calcareous cliffs, but in Ky. *parviflora* is virtually confined to sandstone.

Ranges of *parviflora* and *puberula* overlap along the sandstone cliffs of the Shawnee Hills, and some colls. appear intermediate (e.g. from GRAY at KY, NCU). While all colls. mapped here have the short glandular pubescence of typical *puberula*, their flowers are generally smaller. The coll. from MCRA (R. Athey; check EKY) needs to be verified.

Another potential segregate of *parviflora* to review is *H. missouriensis* Rosendahl, which is known only from a few calcareous sites in se. Mo. (St, J). *H. missouriensis* differs from *parviflora* in its exceptionally small capsules (ca. 2.5-3 mm long), with less spreading beaks, and earlier flowering (Jul-Aug versus Sep-Oct). It was not recognized by Wells (1983; FNA 8), but more detailed study is needed.

HAB 5 // C? 1. **ABU** g8 s7? =.

0249--Mitella diphylla L.

Saxifragaceae: *Mitella diphylla*

This occurs mostly in east-central states, on low slopes in rocky mesic woods on base-rich soils.

HAB 5 + D 1. **ABU** g9 s9 -2.

0250--Sullivantia sullivantii (Torr. & Gray) Britt. R

Saxifragaceae: *Sullivantia sullivantii*

This has a fragmented range in at least five clusters from the central Appalachians to the midwest, usually growing along limestone cliffs. It is known from s. Ind. and s. Ohio in counties adjacent to Ky. In Ky. B reported making a coll. (catalogued as #1202) from CART, "on wet sandstone cliff in Box Canyon", but the coll. has not been relocated in herbaria, and the species cannot be refound at that site. *S. sullivantii* has sometimes been confused with *Heuchera parviflora*.

HAB 5,11 | E 3? **ABU** g6? s1? =?

0251--Boykinia aconitifolia Nutt.

Saxifragaceae: *Boykinia aconitifolia*

This is endemic to the southern Appalachians, usually growing along small streambanks, dripping cliffs and seeps. Although reported from five counties in Ky. (including data of MM and NP), there are still few accessed colls. in herbaria.

HAB 1,6 + B? 3? **ABU** g8 s3 =.

0252--Chrysosplenium americanum Schwein. ex Hook.

Saxifragaceae: *Chrysosplenium americanum*

This northeastern species occurs mostly in wet acid soils at the base of rocky slopes along small seeping shaded streams. In Ky. it is known only from a few scattered records in Appalachian regions, mostly in the Cumberland Mts. and in ravines of the northern Cliff Section.

HAB 6,1 ~ A 2. **ABU** g10 s3 -1.

0253--Astilbe biternata (Vent.) Britt.

Saxifragaceae: *Astilbe biternata*

This is largely restricted to southern Appalachian regions, especially in mesic ravines. It is probably widespread in most of Appalachian Ky. but there are remarkably few recent colls. The only records from the Bluegrass region are old colls. (KY-Agr.) from ANDE and FAYE that seem to be valid. The disjunct record from EDMO (McKinney et al. 1990) needs to be confirmed.

Astilbe biternata is often confused with *Aruncus dioicus* (Rosaceae). Both are tall herbs of mesic woods with compound leaves and paniculate inflorescence of small white unisexual flowers). *A. biternata* is usually dioecious--versus strictly so in *Aruncus*. Habitats are similar habitat, though *Aruncus* is somewhat less restricted to mesic sites. *A. biternata* can be distinguished as follows (FNA 8, W): terminal leaflets 3-lobed (versus 0-2 lobed), glandular (versus nonglandular) hairs on stems and lower leaf surfaces, flowering slightly later, with 10 stamens (versus 15-20), and usually 2-carpellate fruits (versus 3-4).

HAB 5 C 1. **ABU** g8 s8 -2.

0254--*Penthorum sedoides* L.

Penthoraceae [*Saxifragaceae**]: *Penthorum sedoides*

This is widespread in eastern North America, usually along small streams and shorelines in thin woods and edges. See FNA 8 and W for references to family placement.

HAB 2,6,9 :: C 4. **ABU** g10 s10 -2.

0255--*Sedum ternatum* Michx.

Crassulaceae: *Sedum* <*Ternata*> *ternatum*

This unusual succulent of mesic to subxeric woods occurs mostly in east-central states, and is completely absent on the southeastern Coastal Plain (K). It has varied chromosome numbers according to Cr ($2n = 16$ to 48), but FNA 8 reported just $2n = 32$. No segregates have been recognized.

HAB 5,11,7 + D 2. **ABU** g10 s10 -2.

0256--*Sedum glaucophyllum* R.T. Clausen R

Crassulaceae: *Sedum* <*Ternata*> *glaucophyllum*

This is globally rare, known mostly from base-rich outcrops of diverse types in w. Va. and se. W.V., with outliers in w. Md. and nw. N.C. (K, W). It has varied chromosome number; $2n = 28, 44-49, ?56$ (Cr, FNA 8). In Ky. there is a possible poor coll. from CART (KY): C. Weller, 3 Aug 1961, limestone ledge, roadside. The coll. is fruiting, with relatively short, straight, ascending inflorescence branches, and basal offshoots bearing a few small glaucous young leaves.

0257--*Sedum pulchellum* Michx.

Crassulaceae: *Sedum* <*Ternata*> *pulchellum*

This variable species occurs mostly in the Ozark-Ouachita region and the Interior Low Plateaus, on various types of rock; $2n = 22, 44, 66$ (Cr). In Ky. it

is largely restricted to limestone outcrops in three regions: (1) clifftops and rocky pastures along the Kentucky River Palisades of the central Bluegrass region; (2) similar sites along the Cumberland Rv. and its tributaries downstream from the Appalachian Plateaus; (3) flat-rock glades or similar nearby sites in the Pennyrhile Karst Plain around the Shawnee Hills. There may be considerable genetic differentiation among these populations and others across the species' range. Plants of flat-rock glades in c. Tenn. appear to be distinct in several characters (D. Estes, pers. comm.).

HAB r-12 == E 6. **ABU** g8 s8 -1.

0258--*Sedum sarmentosum* Bunge

Crassulaceae: *Sedum sarmentosum*

This cultivated species (a yellow stonecrop) is locally persistent on rocky sites, but it is not clear if new patches have formed disjunct from original plantings; $2n = 72$.

ALI AS. **HAB** R-12 == D 6. **ABU** +4.

0259--*Sedum acre* L.

Crassulaceae: *Sedum acre*

This is often cultivated (as "golden carpet" stonecrop), and it may be locally escaped; $2n = 80$.

ALI EU. **HAB** R-12 == C 6. **ABU** +4.

0260--*Hylotelephium telephioides* (Michx.) H. Ohba

Crassulaceae: *Hylotelephium* [*Sedum**] *telephioides*

This occurs in the central Appalachians east of Ky., and on cliffs in disjunct localities of w. Ky., s. Ind and s. Ill. near the Ohio Rv. It is generally diploid ($2n = 24$, rarely 48). Some reports (including from CALL and FULT) may be based on escaped waifs of *H. telephium*, which is commonly cultivated (M).

HAB 5,11? +\ D? 2. **ABU** g7? s4 -1.

0261--*Hylotelephium telephium* (L.) H. Ohba W

Crassulaceae: *Hylotelephium* [*Sedum**] *telephium* {sensu lato}

This cultivated Eurasian species occasionally escapes, especially on floodplains, but it does not seem to be persistent. Woods & Fuller (1988) reported it from CALL (MUR), but the coll. cannot be found; see also Heineke (1987) for a possible record from FULT (M). Under *Sedum*, these plants have generally been referred to the European ssp. *purpureum* (L.) Schinz & R. Keller, but the Asian ssp. *alboroseum* (Baker) Frod. is also expected. The latter reportedly has higher chromosome numbers ($2n = 48$ or

56 versus mostly 36) and is better treated as *H. erythostichum* (Miq.) H. Ohba; see Y and FNA 8 for details.
ALI EU.

0262--Myriophyllum pinnatum (Walt.) B.S.P.

Haloragaceae: *Myriophyllum pinnatum* (scabratum)

There are only two or three Ky. records for this southeastern aquatic species (F, M). but it may be easily overlooked. There have been no new reports since the 1970s; old localities need to be rechecked.

HAB 2,3 ~ C? 6? **ABU** g9 s1 -6?

0263--Myriophyllum aquaticum (Vell.) Verdc.

Haloragaceae: *Myriophyllum aquaticum* (brasiliense)

This robust subtropical species is much used in aquaria and it has become widely naturalized in southern states (K), but only female plants are known in North America (Cr). Ky. is at the northern limit of the current range. The first colls. were made in the 1970s (Cranfill & Thieret 1981).

ALI SA. **HAB** 2 ~ D? 6. **ABU** +4.

0264--Myriophyllum spicatum L.

Haloragaceae: *Myriophyllum spicatum* (var. s.)

This aquatic species has been widely established in North America and it has often escaped, becoming a locally abundant weed. The first report from Ky was made ca. 1940 (M). There has been nomenclatural confusion with the closely related *M. sibiricum* Komarov. (= *M. exalbescens* Fern.), which is native across northern and western North America, but unknown in Ky. and most southeastern states (Cr, W).

ALI EU. **HAB** 2,1 ~ D 6? **ABU** +5*.

0265--Myriophyllum heterophyllum Michx.

Haloragaceae: *Myriophyllum heterophyllum*

This rare native aquatic is widely scattered in eastern North America, especially in coastal regions and in mid-western wetlands (K). It is similar to the alien *spicatum*, and without inflorescences it may be difficult to distinguish (Cr, W). Leaves are pinnatisect into capillary segments (versus stiffer, thicker, arcuate segments). Internodes tend to be shorter (ca. 1-1.5 cm versus 1-3 cm), and they dry pale brown to reddish (versus whitish to pale tan). It can also be confused with *Proserpinaca pectinata*.

HAB 2,1 ~ C? 6? **ABU** g9 s4 -5.

0266--Proserpinaca palustris L. var. crebra Fern. & Grisc.

Haloragaceae: *Proserpinaca palustris* var. *crebra*

This is widespread in eastern North America and in Central America. It is clearly the most common variety in the state, but some colls. need to be checked. A few colls. from LINC and ROCK (KY) may be transitional to the var. *palustris* (with larger, more angled fruit), which has also been reported from CALL (Catling 1998) and HICK (Grubbs 1989). *P. palustris* may also be confused--or perhaps hybridized--with *P. pectinata* Lam., which occurs largely on the southeastern Coastal Plain, but also at disjunct sites on the Cumberland Plateau in Tenn. (Ch, Catling 1998). *P. pectinata* has been reported from Ky., but apparently in error (M).

HAB 2,6,9? ~ C 3? **ABU** g10 s8 -3.

0267--Proserpinaca palustris L. var. amblyogona Fern. R

Haloragaceae: *Proserpinaca palustris* var. *amblyogona*

This is a widespread midwestern variety (with obtusely angled fruit), which extends into the lower Mississippi Valley (Catling 1998). There is a record from GRAV (R. Athey coll. for EKY; BA), but this has not been confirmed.

HAB 2,6,9? ~ C? 3? **ABU** g9 s4? -3?

0268--Proserpinaca palustris L. var. palustris R

Haloragaceae: *Proserpinaca palustris* var. *p.*

This southern segregate, or at least transitions to var. *crebra*, probably occurs in Ky., but definitive colls have not yet been seen. See notes under var. *crebra*.

HAB 2,6,9? ~ C? 3? **ABU** g8 s4? -3?

0269--Vitis rotundifolia Michx.

Vitaceae: *Vitis* <*Muscadinia*> *rotundifolia*

This famous southeastern grape ("muscadine") is locally abundant in two regions of the state, with almost none between: (1) on gravel hills along the lower Tennessee and Cumberland River, and (2) on sandy uplands of the southern Appalachian Plateaus. It occurs mostly in subxeric woods on acid soils, often dominating the ground in shade and locally climbing high to fruit at edges.

Typical *rotundifolia* has fruits that are much larger, sweeter and smellier than most other native *Vitis* species: ca. 12-20 mm versus 4-12 mm (but see *labrusca*). Many cultivars are grown to the south of Ky. In addition to differences in vegetative form (W) and fruit chemistry, subgenus *Muscadinia*

has more chromosomes than other *Vitis* ($2n = 40$ versus 38) and hybrids with typical *Vitis* are virtually unknown.

HAB 10,8,7,11 B 3. **ABU** g9 s8 -2.

0270--*Vitis palmata* Vahl

Vitaceae: *Vitis palmata*

This southeastern species occurs mostly along larger streams in the lower Mississippi Rv. valley. The disjunct record from HENR (Duncan 1967) needs further verification. More complete colls. are needed to distinguish *palmata* from *vulpina* in some regions. Distinctive features of *palmata* include: relatively small (ca. 5-15 x 5-10 cm), deeply lobed leaves (about half way to midrib); branchlets reddish or purplish, with diaphragms ca. 3-5 mm thick. Young or vigorous shoots of *vulpina* can resemble *palmata*.

HAB 2,6,3? D? 4. **ABU** g8 s7 -2.

0271--*Vitis vulpina* L.

Vitaceae: *Vitis vulpina* (*cordifolia*)

This is widespread in eastern states, with a range centered between *palmata* and *riparia*. Some colls. are difficult to distinguish from *palmata*, *riparia*, *baileyana* or *aestivalis*, and the potential for hybridization need investigation; $2n = 38$ in all (?) of these species. Distinctive features of *vulpina* include: leaves moderately large and rotund (ca. 5-15 x 5-15 cm) with relatively shallow lobes and blunt teeth; mature branchlets usually subterete, grayish or brownish (but often purplish when young), with diaphragms ca. 1-3 mm thick.

HAB 8,7,10,4 D 4. **ABU** g10 s10 -2.

0272--*Vitis riparia* Michx.

Vitaceae: *Vitis riparia* (*vulpina* ssp. r.)

This widespread northern species extends south to c. La. along the Mississippi Rv., but its southeastern limits remain uncertain (Duncan 1967; Moore 1991; W). It is scattered along the Ohio Rv. and Kentucky Rv., but seems virtually absent along the Green Rv. and Cumberland Rv. except near Nashville (Ch). Some colls. are difficult to distinguish from *vulpina*, and need to be rechecked. Distinctive features of *riparia* include: relatively large fruits (ca. 7-12 mm versus ca. 5-8 mm in *palmata* or *vulpina*), with a heavy glaucous bloom; leaves relatively large (ca. 10-20 x 5-15 cm) with lobes sharp and slightly ascending; branchlets terete, dull reddish, with diaphragms only ca. 0.5-2 mm.

HAB 1,4 D 4. **ABU** g10 s8 -2.

0273--*Vitis rupestris* Scheele

Vitaceae: *Vitis rupestris*

This distinctive grape has generally prostrate stems, small rotund leaves and few tendrils. It occurs mostly on cobble-bars along or near medium-sized creeks and rivers of south-central states in the central and lower Mississippi Rv. drainage. There are also disjunct plants in Atlantic states from Va. to Pa. (PL). In Ky. and Tenn. (Ch) some records need further verification, and more field work is needed to document the range. It is locally common along the Rockcastle Rv., and perhaps scattered elsewhere along the lower Cumberland Rv. and lower Tennessee Rv. It also occurs in s. Ind. and should be expected in w. Ky. (D, PL).

HAB 1 C 6. **ABU** g7? s4 -1.

0274--*Vitis baileyana* Munson

Vitaceae: *Vitis baileyana* (*cinerea* var. b.*)

This largely Appalachian-Ozarkian taxon has been neglected in Ky. and needs further study. It is sometimes treated as a variety of *cinerea*, close to var. *floridana* but with less arachnoid pubescence (Moore 1991, J, W). However, *baileyana* often appears closer to *vulpina* (F), and hybrid origin is suspected. It differs from *vulpina* in its leaves permanently pilose and sometimes slightly arachnoid (versus glabrous or glabrate), usually more rounded and with shorter teeth; its branchlets are angled (versus terete), usually with reddish nodes (versus green); pedicels are usually <3 mm long (versus ca. 5 mm). N. Hill (pers. comm.) found that the seed-bank in old growth forest of LETC contains frequent *baileyana*, but virtually no *vulpina*.

HAB 8,7,10? C 4. **ABU** g8 s8 -1.

0275--*Vitis cinerea* (Engelm.) Millard

Vitaceae: *Vitis cinerea* (var. c.)

This species of south-central states occurs mostly in the lower Mississippi watershed, but scattered north as far as w. Ohio. Peripheral or disjunct records need checking in several cases, and variation needs further study. Colls. from ANDE and FRAN (KY) appear transitional to *vulpina*, and such plants have suggested combination with *baileyana* in some treatments (Duncan 1967; CW). Colls. from BOYD (KY), LAUR (JC) and perhaps elsewhere may be referable to var. *floridana* Munson, which has been distinguished (F, Cr) based largely on its reddish hairs, suggesting a transition to *labrusca*. However, Moore (1991) considered var. *floridana* a more southern taxon (absent in Ky. & Tenn.) without hirtellous pubescence (in contrast to *cinerea* and *labrusca*).

HAB 6,9,4 C 4. **ABU** g9 s8 -2.

0276--Vitis labrusca L.

Vitaceae: *Vitis labrusca* (+ *X labruscana*?)

This largely northeastern species is a parent of the Concord grape and various other cultivated hybrids, often known collectively as *V. X labruscana* L.H. Bailey. Further review of colls. is needed. True *labrusca* does seem to be locally native (as mapped with solid dots), especially on damp acid soils in eastern hills or near the Ohio Rv. But the status of some colls. remains dubious as wild plants, or needs closer examination for distinction from *cinerea*. *V. labrusca* differs from other eastern species in the permanent dense rusty pubescence of its lower leaf surfaces (versus largely deciduous to glabrous), and the more frequent tendrils or inflorescences along stems (at 3-7 successive nodes versus usually 1-2).

HAB 9,6? C? 4. **ABU** g10 s5? -3?

0277--Vitis aestivalis Michx. var. aestivalis

Vitaceae: *Vitis aestivalis* var. a.

This widespread eastern species is highly variable, and appears to intergrade with some related species (Duncan 1967, Moore 1991). See notes under var. *bicolor*.

HAB 8,7,10,11 C 4. **ABU** g10 s10 -2.

0278--Vitis aestivalis Michx. var. bicolor Deam

Vitaceae: *Vitis aestivalis** var. *bicolor* (*argentifolia*)

This relatively northern variety may not be worth distinguishing from the more southern var. *aestivalis*; both are widespread in Ky. [A similar situation occurs in *Smilax glauca*.] Var. *bicolor* may differ (Moore 1991) in its smaller mature berries (ca. 8-9 mm versus 10-12 mm), as well as its glabrous or glabrate lower leaf surfaces, exposing the glaucous surface (versus arachnoid pubescent); nodes are usually glaucous, with narrower diaphragms (<2 mm diameter).

HAB 10,11,8,7? C 4. **ABU** g9 s9 -2.

0279--Ampelopsis brevipedunculata (Maxim.) Trautv.

Vitaceae: *Ampelopsis brevipedunculata*

This frequently cultivated ornamental alien ("porcelain berry") was first reported by BA in 1992. It has escaped into parks, roadsides and other urban and suburban sites, but it has not yet spread significantly into rural areas. In Louisville, it became locally dominant in Cherokee Park after the 1974 tornado, and is now widespread in the city (P. Haragan, pers. comm.).

ALI AS. **HAB** 8,7? D? 4. **ABU** +4*.

0280--Ampelopsis cordata Michx.

Vitaceae: *Ampelopsis cordata*

In Ky. this southeastern species is widely scattered but concentrated along larger streams and rivers, especially in western regions. It has spread locally onto uplands, probably after forest clearance. Short (1840) just noted: "on the banks of the Ohio River." The northern limit of this species is close to the Ohio Rv. in Ill., Ind. and Ohio, and further east there are only a few records north of S.C. (K, PL).

HAB 1,4,6,7? D 3. **ABU** g10 s9 -3.

0281--Ampelopsis arborea (L.) Koehne

Vitaceae: *Ampelopsis arborea*

In Ky. this southeastern species is locally common along the Mississippi Rv., lower Tennessee Rv. and lower Cumberland Rv. It is generally rare elsewhere except for a cluster of records along the central Ky. Rv. or nearby. Some disjunct records may be escapes from cultivation; see also Duncan (1967).

HAB 2,6,3,9? C? 4. **ABU** g9 s8 -3.

0282--Parthenocissus tricuspidata (Sieb. & Zucc.) Planch. C

Vitaceae: *Parthenocissus tricuspidata*

Colls. from FAYE (KY), JEFF (MM for WKY) and perhaps elsewhere suggest that this widely cultivated species ("Boston-ivy") can become locally naturalized in urban areas, but it does not seem to be spreading through the landscape.

ALI AS.

0283--Parthenocissus quinquefolia (L.) Planch.

Vitaceae: *Parthenocissus quinquefolia*

This is a widespread eastern species. Colls. from KENT and WEBS (KNK) have been referred to *P. vitacea* (Knerr) A.S. Hitchc. (erroneously known as *P. inserta* (Kerner) Fritsch), but they are not clearly distinct. *P. vitacea* is a more northern and western species that is unknown in Ky.

HAB 7,5,11,4 D 3. **ABU** g10 s10 -2.

0284--Geranium maculatum L.

Geraniaceae: *Geranium maculatum*

This perennial is widespread in woods across much of eastern North America, though rare to absent on the southeastern Coastal Plain. Its life-history has

been intensively studied, especially the frequent "gynodioecy" of some populations, with male-sterile and hermaphrodite plants (e.g. Chang 2006). But there does not appear to have been a comprehensive survey of variation across its range, including cytology; Aedo (2001) recently noted $2n = 52$. *G. maculatum* appears close to several diploids in western North America and Eurasia with $2n = 28$.

HAB 7,5,4 C 2. **ABU** g10 s10 -2.

0285--*Geranium carolinianum* L. var. *carolinianum*

Geraniaceae: *Geranium carolinianum* var. *carolinianum*

This tetraploid ($2n = 52$) species is a robust annual or biennial, native in eastern and western states. It is even a locally problematic weed in horticultural settings. In Ky. var. *carolinianum* appears to be the predominant variety but further checking is needed.

HAB h-10 :: D 6. **ABU** g10 s10 =?

0286--*Geranium carolinianum* L. var. *confertiflorum* Fern.

Geraniaceae: *Geranium carolinianum* var. *confertifolium*

This partly replaces var. *carolinianum* in northeastern regions. The separation of varieties here is provisional. Although generally recognized in recent treatments (W), differences in pubescence and inflorescence are not clearcut in Ky., and there may be little difference in distribution within the state.

HAB h-10 :: D 6. **ABU** g9 s9? =?

0287--*Geranium dissectum* L.

Geraniaceae: *Geranium dissectum*

This is an occasional weed across northeastern states, especially along roadsides and similar sites, often in nurseries and greenhouses. In Ky., the first records date from 1970-90 (M). Though not closely related ($2n = 22$), it can be confused with the native *carolinianum*, and further checking is desirable in herbaria. It has upper leaves with more linear, acute segments; flowers deep red-violet/maroon (versus pink); carpel bodies short-hispid with spreading hairs (versus long-villous with ascending hairs); and carpel beaks densely glandular (versus with few or no glands).

ALI EU. **HAB** H-10 ::: E 6. **ABU** +4.

0288--*Geranium columbinum* L.

Geraniaceae: *Geranium columbinum*

This distinctive weed ($2n = 18$) is widely naturalized across northeastern states. In Ky. the first records date from the 1930s (B).

ALI EU. **HAB** R-10 ::: E 6. **ABU** +5.

0289--*Geranium pusillum* L.

Geraniaceae: *Geranium* <*Robertium*> *pusillum*

This is widely naturalized across northern states. In Ky. the first records date from 1940-60 (M).

ALI EU. **HAB** S-10 ::: E? 6. **ABU** +5.

0290--*Geranium molle* L.

Geraniaceae: *Geranium* <*Robertium*> *molle*

This is widely naturalized across northern states. In Ky. the first records date from the 1950s. A few plants were initially identified as *G. rotundifolium* L. (Gunn 1968). These two species plus *pusillum* are closely related weeds ($2n = 26$), with ecological differences poorly understood. Hybrids are not documented.

ALI EU. **HAB** S-10 ::: C? 6. **ABU** +4.

0291--*Geranium robertianum* L. R

Geraniaceae: *Geranium* <*Robertium*> *robertianum* (var. r.)

This is a widespread northern (circumboreal) polyploid ($2n = 64$), but perhaps only naturalized in most eastern states. It is known from a few scattered sites in the Ohio Valley, including nc. Tenn., where it is considered native (Ch). In Ky. it was reported by Hussey (1876) from EDMO or nearby, but no coll. has been located at Purdue or elsewhere.

ALI n?

0292--*Erodium cicutarium* (L.) L'Hér. ex Ait.

Geraniaceae: *Erodium cicutarium*

This Mediterranean weed is now widespread across North America. Browne (1974) first reported it from Ky. Variation deserves further study ($2n = 20, 40$). The coll. from GALL (M. Medley #15061-86 at KNK & WKY) is referable to ssp. *bipinnatum* Tour., which has not been reported widely in North America, if at all.

ALI EU. **HAB** S-10 ::: E? 6. **ABU** +4.

0293--*Staphylea trifolia* L.

Staphyleaceae: *Staphylea trifolia*

This occurs mostly in east-central states. In Ky. it is most common in mesic forest on rocky calcareous slopes, where thickets are characteristic at mid- to low slope positions. But it does occur locally on other base-rich sites.

HAB 5,11 E 1. **ABU** g9 s9 -2.

0294--Rhexia virginica L.

Melastomataceae: *Rhexia virginica*

This is a widespread eastern species, but generally restricted to wet acid soils.

HAB 9,2 B 5. **ABU** g9 s8 -3.

0295--Rhexia mariana L. var. mariana

Melastomataceae: *Rhexia mariana* var. m. (var. *leiosperma*)

This is a widespread southeastern species, but generally restricted to strongly acid soils with more seasonal drying than *virginica*. See notes under var. interior.

HAB 9 A 5. **ABU** g8 s8 -3.

0296--Rhexia mariana L. var. interior (Pennell) Kral & Bostick

Melastomataceae: *Rhexia mariana* var. interior

The records mapped here (B, M) need to be rechecked. True interior is distributed in the central Mississippi Valley, while *mariana* is largely southeastern. But there appears to be some intergradation. Some plants mapped here as *mariana* appear transitional to interior (including those that have been called var. *leiosperma* Fern. & Grisc.). *R. mariana* var. *ventricosa* (Fern. & Grisc.) Kral & Bostick is a somewhat intermediate taxon that occurs only east of the Appalachians, but has been reported from Ky. in error (M)

HAB 9,2? C? 5. **ABU** g7? s5? -4.

0297--Lagerstroemia indica L. C

Lythraceae: *Lagerstroemia indica*

This is a commonly cultivated shrub ("crape-myrtle") that occasionally persists at abandoned homesites (Chester 1992). There is no definite evidence of naturalization in Ky., but occasional escapes from seed have been reported in s. Ohio (M. Vincent, pers. comm.).

ALI AS.

0298--Decodon verticillatus (L.) Ell.

Lythraceae: *Decodon verticillatus*

This is a widespread eastern species. Most plants in Ky. are relatively glabrous, matching var. *laevigatus* Torr. & Gray. Colls. from BATH and HOPK (KY) match the pubescent var. *verticillatus*. The latter has been considered to have a more coastal range (Cr), but the distinction has not been made in some recent treatments (e.g. Graham 1975; W).

HAB 2 ~ C 4. **ABU** g10 s5 -4.

0299--Rotala ramosior (L.) Koehne

Lythraceae: *Rotala ramosior*

This is widely scattered in wetlands of North and Central America. Most plants from the lower Ohio Valley are referable to the relatively robust var. interior Fern. & Grisc. However, in Ky. there is much overlap in distribution with typical *ramosior*. The distinction has not been followed in most recent treatments (Graham 1975; Cr, W).

HAB 2,9 ::: C 6. **ABU** g10 s9 -2?

0300--Ammannia robusta Heer & Regel

Lythraceae: *Ammannia robusta*

This is widespread in western North America and Central America, especially along larger streams (Cusick 1989). It has often been confused with *coccinea*, and further study is needed for reliable separation of records (Graham 1985; Cr). *A. robusta* differs in its pale lavender petals (versus rose-purple) and pale yellow anthers (versus deep yellow); shorter peduncles (0-1 mm versus 0-4+ mm) and pedicels. Its fruits tend to be larger (4-6 mm thick versus 3.5-5 mm) and less numerous per axil (usually 1-3 versus 3-5). Its leaves tend to be relatively large on well-grown plants (up to ca. 50-70 x 5-10 mm), but those on branches and smaller plants are more like *coccinea* (mostly ca. 20-40 x 3-5 mm).

HAB 2,1 ::: D? 6. **ABU** g10 s5? -2?

0301--Ammannia coccinea Rottb.

Lythraceae: *Ammannia coccinea*

This is widespread in wetlands from southeastern states to Central America. It is an amphiploid ($2n = 66$), derived from *robusta* ($2n = 34$) and *A. auriculata* Willd. ($2n = 32$), which is more western and southern. The latter has been reported from Ky., but probably in error (M). See notes under *robusta*; more records may be transferred to *robusta*, following closer study. McFarland (1942) also reported *A. koehnei* Britt. (a segregate of the more tropical *A. latifolia* L.) from Ky., but probably in error (M).

HAB 9,2,1 ::: C 6. **ABU** g10 s8 -2?

0302--Didiplis diandra (Nutt. ex DC.) Wood

Lythraceae: *Didiplis* [*Lythrum*] (*Peplis*) *diandra*

Although widely scattered across southeastern states and up the Mississippi Valley to Minn., this monotypic aquatic herb is rarely recorded. In Ky., it

appears to be associated with large old mature oxbow lakes and ponds, which may draw down substantially in the summer.

HAB 2 ~ C 6. **ABU** g8? s5? -3?

0303--Lythrum lanceolatum Ell.

Lythraceae: *Lythrum lanceolatum* (alatum var. l.*)

Species status for this southeastern segregate of alatum has been revived in some recent treatments (W). Typical alatum occurs from the northern Great Plains to northeastern states. There is little overlap of ranges, except perhaps in Ky. and Tenn., and lanceolatum becomes rare towards the north within these two states (Graham 1975; PL).

HAB 9,10? C? 5. **ABU** g8 s2 -5.

0304--Lythrum alatum Pursh

Lythraceae: *Lythrum alatum* (var. a.*)

See notes under lanceolatum.

HAB 9,10 E 5. **ABU** g9 s7 -4.

0305--Lythrum salicaria L.

Lythraceae: *Lythrum salicaria*

In North America, this has become naturalized mostly in northeastern states and adjacent Canada. In Ky. it has become established at several localities, but it does not seem to be as invasive here as further north. Colls. from CAMP, GALL and GRNP (KNK) are referable to var. tomentosa (P. Mill) DC., but that taxon is not recognized in recent treatments.

ALI EU. **HAB** 9,2 D 5. **ABU** +5*.

0306--Cuphea viscosissima Jacq.

Lythraceae: *Cuphea viscosissima* (petiolata)

This annual is known mostly from east-central states, in a variety of open habitats with thin vegetation.

HAB r-12,10,9 +:: D 6. **ABU** g9 s9 +1?

0307--Ludwigia peploides (Kunth) Raven var. glabrescens (Kuntze)

Shinners

Onagraceae: *Ludwigia* <*Oligospermum*> (*Jussiaea*) *peploides* var. *glabrescens* (*J. repens* var. *g.*; *diffusa*)

This tetraploid (2n = 32) is a widespread native in Central and South America, but there is some uncertainty about when it spread into the southern U.S.A. (W). In Ky. the earliest records may date from the 1930s (B). It has become

common and locally abundant along gentle shores of ponds and slow streams, especially in eutrophic water that drops during summer.

ALI s. **HAB** 2 ~ D 6. **ABU** g10 s8 +1?

0308--Ludwigia hexapetala (Hook. & Arn.) Zardini, Gu & Raven

Onagraceae: *Ludwigia* <*Oligospermum*> (*Jussiaea*) *hexapetala*

(*uruguayensis**; *grandiflora* ssp. *h.*)

This robust rhizomatous decaploid (2n = 80) occurs from southern states to South America. Nesom & Kartesz (2000) have argued for its inclusion as a subspecies within *L. grandiflora* (Michx.) Greuter & Burdet, typical plants of which are hexaploid (2n = 48) and alien to North America. But until definitive evidence of intergradation is presented for plants in east-central states, it seems reasonable to emphasize the distinction and native status of *hexapetala*.

The only Ky. records for *hexapetala* are Short's (1840) report from HEND in 1838 (check PH), and some 1980s colls. from further west (Grubbs 1989, Chester 1992); further verification is desirable in some of these cases. Short noted: "in a marsh... ten miles south of the Ohio River. It was rare; but its existence there proved its adaptation to the climate; and if the views lately promulgated as to its health-preserving influences be sustained, it would doubtless be desirable to propagate it extensively in malarious and miasmatic districts."

ALI s. **HAB** 2 ~ D? 6. **ABU** +4.

0309--Ludwigia leptocarpa (Nutt.) Hara

Onagraceae: *Ludwigia* <*Seminuda*> (*Jussiaea*) *leptocarpa*

This short-lived perennial or annual occurs in wetlands and riparian vegetation from the southeastern states to South America.

HAB 1,2 ::? D 6? **ABU** g10 s8 -2.

0310--Ludwigia decurrens Walt.

Onagraceae: *Ludwigia* <*Myrtocarpus*> (*Jussiaea*) *decurrens*

This annual is widespread in wetlands from southeastern states to South America.

HAB 6,2 ::? C 5. **ABU** g10 s8 -2.

0311--Ludwigia glandulosa Walt.

Onagraceae: *Ludwigia* <*Microcarpum*> *glandulosa*

This stoloniferous tetraploid (2n = 32) occurs in wetlands of southeastern states, mostly on the Coastal Plain. The related diploid, *L. linearis* Walter, was

reported from Ky. by BA but no coll. has been located; it is a more southern species unlikely to occur in the state.

HAB 9,2 C? 5. **ABU** g8 s8 -3.

0312--Ludwigia polycarpa Short & Peter

Onagraceae: *Ludwigia* <*Microcarpum*> *polycarpa*

This stoloniferous tetraploid ($2n = 32$) is largely midwestern. It is uncommon to rare across much of its southern and eastern range, including only sporadic reports from Ark., Ala., Tenn. and Va. (Ch, W). In Ky. it is virtually restricted to counties bordering the Ohio Rv. A holotype is at KY; the species was discovered by H.A. Griswold in "wetlands around Louisville, where it occurs in great abundance" (Short & Peter 1835).

Two related southeastern species can be expected in Ky. (F, J, K): the diploid *L. microcarpa* Michx. (usually on base-rich soils), and the "polymorphic" tetraploid *L. sphaerocarpa* Ell. (usually on sandy/peaty soils); see W for a detailed key. Both are most common on the Coastal Plain, but there are scattered records north to Tenn., and *sphaerocarpa* occurs around the southern side of Lake Michigan.

HAB 9,6? C? 6? **ABU** g9 s7? -4.

0313--Ludwigia alternifolia L.

Onagraceae: *Ludwigia* <*Ludwigia*> *alternifolia*

This diploid ($2n = 16$) perennial is widespread in southeastern states on damp acid soils.

HAB 9,6 C 5. **ABU** g10 s9 -2.

0314--Ludwigia hirtella Raf.

Onagraceae: *Ludwigia* <*Ludwigia*> *hirtella*

This occurs mostly in pine savannas on the Coastal Plain, but has disjunct populations from the Ozarks to the Appalachians. In Ky. it is known only from a few sites that are probably remnants of thin woods or grassy openings, especially on seasonally wet acid soils.

HAB 9 A 5. **ABU** g8 s3 -5.

0315--Ludwigia palustris (L.) Ell.

Onagraceae: *Ludwigia* <*Dantia*> *palustris*

This is widespread in wetlands across the Northern Hemisphere. In Ky. all plants may be referred to var. *americana* (DC.) Fern. & Grisc.; typical plants

are European (F). However, this distinction is not followed in recent treatments.

HAB 2,6,9 ~ C 5? **ABU** g10 s9 -2.

0316--Epilobium coloratum Biehler

Onagraceae: *Epilobium coloratum*

This a widespread perennial in eastern North America, but rare to absent on the southeastern Coastal Plain.

HAB 4,1,6 ::? D 4. **ABU** g9 s9 -3.

0317--Epilobium ciliatum Raf.

Onagraceae: *Epilobium ciliatum* (ssp. c.; *adenocaulon*, *glandulosum* var. a.)

This northern and western perennial has been collected at two sites and there are other unverified reports (M). Its more northern (circumboreal) relative, *E. glandulosum* Lehm. (*ciliatum* var. g.), has been reported from BELL, but no coll. has been seen and it may well have been confused with *ciliatum*. *E. ciliatum* may also hybridize with *coloratum* (Cr).

HAB 6,1? ::? B? 3? **ABU** g10 s2 -4?

0318--Epilobium leptophyllum Raf. R

Onagraceae: *Epilobium leptophyllum* ("palustre")

This stoloniferous perennial is a widespread northern and western species that could well occur in Ky. In some literature there has been confusion with the more northern species, *E. palustre* L. Plants under either of these names have been reported for Ky. by Short (1840), Gl and other authors (M). However, no coll. has been yet been discovered in herbaria.

0319--Epilobium brachycarpum K. Presl W

Onagraceae: *Epilobium brachycarpum*

This is a western annual that is rarely adventive in eastern North America. It has been recently documented by Kartesz et al. (1997) from railroad tracks in KENT (KNK). The only other records east of the Mississippi are from Wisconsin and Minnesota (K, PL)

ALI W.

0320--Oenothera grandiflora L'Hér. ex Ait. R

Onagraceae: *Oenothera* <*Oenothera*> *grandiflora* (*biennis* var. g.)

This distinctly large-flowered species (with petals ca. 2.5-4 cm long and elevated stigmas) is native to southeastern states (mostly Miss. to N.C.). A relatively robust, pubescent cultigen derived at least partly from *grandiflora* is

known as *O. glazioviana* Micheli in Martius (= *O. erythrocephala* Borbas), which became cultivated (as "biennis") in Europe early after settlement, and then more widely distributed (Dietrich et al. 1997). For Ky. there is a coll. of C.W. Short (PH) labeled "Lexington" (see also Short et al. 1833); also, there are reports of "biennis var. grandiflora Lindl." from n. and w. Ky. (Linney 1882; Pr, check MO).

ALI EU.

0321--*Oenothera nutans* Atkinson & Bartlett

Onagraceae: *Oenothera* <*Oenothera*> *nutans* (biennis* var. *austromontana*) This relatively glabrous, moderately large-flowered species (with petals ca. 2-2.5 cm long) may be derived from *grandiflora* (Dietrich et al. 1997). It is widespread in northeastern regions and the southern Appalachians above 800 m (W); there are also scattered reports west to Ky., Ind. and Mo. (PL). Colls. have been reported from HARL (Univ. of Colorado), MADI (Univ. of Kansas), MENI (B, check US), and perhaps CALL (Dietrich et al. 1997). Further study of colls. filed under *biennis* and *parviflora* is desirable.

HAB H-10? ::: C? 6. **ABU** g9? s7? -2.

0322--*Oenothera biennis* L.

Onagraceae: *Oenothera* <*Oenothera*> *biennis* (var. *b.*, *pycnocarpa*) This widespread tall native annual or biennial weed (with petals ca. 1-2 cm long) appears to have originated from hybrids of *villosa* and *nutans* (Dietrich et al. 1997). There are two cytological types, with switched maternal and paternal origins, but attempts to distinguish these morphologically (e.g. as ssp. *centralis* Munz and ssp. *caeciarum* Munz) have not been successful. When biennial, rosettes of *Oenothera biennis* are similar to those of the strictly biennial *Gaura biennis*, but leaves differ in their dull green upper surfaces (versus deep glossy green), their shorter hairs (ca. 0.1-0.3 mm versus 0.5-1 mm), and their more remotely denticulate margins.

HAB H-10 ::: D 6. **ABU** g10 s10 +2?

0323--*Oenothera parviflora* L.

Onagraceae: *Oenothera* <*Oenothera*> *parviflora* (var. *p.*, *laevigata*) This weedy northern species extends south to N.C. in the Blue Ridge, and there are scattered records from the Ohio Valley, especially Ind. It is likely that *parviflora* originated from hybridization of *nutans* with another species. *O. oakesiana* (Gray) J.W. Robbins ex S. Wats. & Coult. is a less widespread northern species probably derived from hybridization of *parviflora* with *biennis* (Dietrich et al. 1997). There are colls. from ADAI (EKY), FAYE

(Univ. of Ind.), HICK (Montreal Bot. Gard.) and perhaps elsewhere. B's coll. of *oakesiana* from HARL (US) is tentatively included here, since Munz (1937) redetermined it as *O. laevigata* Bartlett, a synonym of *parviflora*.

HAB F-10,12,1? ::: C? 6. **ABU** g9? s7? -2.

0324--*Oenothera villosa* Thunb.

Onagraceae: *Oenothera* <*Oenothera*> *villosa* (*canovirens*, *biennis** var. *canescens*)

This largely midwestern species is often confused with the largely eastern *biennis*, and further analysis is needed. Colls. from CALL, DAVI, GRAV and HICK (MUR, SIU) have been referred to *O. strigosa* (Rydb.) MacKenzie & Bush, which has been treated as a more western subspecies of *villosa*, but these determinations appear to be erroneous (Dietrich et al. 1997).

ALI w. **HAB** H-10 ::: D? 6. **ABU** g10 s8? +1?

0325--*Oenothera laciniata* Hill

Onagraceae: *Oenothera* <*Raimannia*> *laciniata*

This weedy annual is widespread in temperate North America. In Ky. it is widely scattered, especially on sandy soils, including some river bottoms (e.g. Gm), but generally absent on rich calcareous soils.

HAB H-10 ::: C? 6. **ABU** g10 s8 +1?

0326--*Oenothera clelandii* W. Dietr., Raven & W.L. Wagner

Onagraceae: *Oenothera* <*Raimannia*> *clelandii* ("rhombipetala")

This northern species occurs in prairies and fields on sandy soil, mostly in the upper midwest, with disjunct occurrences east to New Jersey and eastern New York. The few colls. from Ky. need to be rechecked (Davies 1955, Dietrich & Wagner 1988, Campbell et al. 1992).

HAB f-9,2? ::: C? 6. **ABU** g8 s2? -4?

0327--*Oenothera perennis* L.

Onagraceae: *Oenothera* <*Kneiffia*> *perennis* (*pumila*)

This is a relatively northern species that appears close to the more southern *fruticosa*, but differs in its persistent overwintering basal rosettes; its greatly reduced upper leaves; its stipitate-glandular inflorescence (versus appressed-pubescent), which is often nodding; and its usually smaller flowers with petals ca. 5-10 mm long (versus 15-20 mm). Although the species is reportedly just diploid (2n = 14), it is a "complex heterozygote" (Cr).

Compared to *fruticosa*, *perennis* is much less common in Ky., being restricted to distinctly damper sites, including hydroxeric soils that dry out in summer. However, the mapping here is provisional; a few colls. should perhaps be transferred to *tetragona*, including those from Appalachian riverbanks. Plants in western regions generally match *perennis* but at least some (e.g. from MARS) have relatively erect (not nodding) inflorescences with larger flowers, suggesting a transition to *tetragona*.

HAB f-9 C 5. **ABU** g10 s4 -4.

0328--*Oenothera glauca* Michx.

Onagraceae: *Oenothera* <*Kneiffia*> *glauca* (*fraseri*; *fruticosa* ssp. *glauca**; vars./ssp. in *tetragona*)

This is a largely Appalachian taxon that probably deserves species status. There has been much confusion with typical *tetragona* and *fruticosa*, partly due to complex nomenclature and conflicting treatments; see notes under those species. *O. glauca* and its allies in the *tetragona* group may all be tetraploids ($2n = 28$), while the *fruticosa* group is often hexaploid or octoploid (Cr).

HAB r-7,8,11 B 3. **ABU** g8 s8 -1.

0329--*Oenothera tetragona* Roth var. *tetragona* T

Onagraceae: *Oenothera* <*Kneiffia*> *tetragona* var. *t.* (*ambigua*, ?*longistipata*)
Deeper revision is needed (W). Typical *tetragona* is a taxon of dry or damp woods and edges in northeastern states. It is close to *glauca* (= *fraseri*) but with flowers usually smaller (petals 12-25 mm long versus 20-35 mm), and leaves narrower (ca. 5-10 mm wide versus 10-30 mm). There may be some intergradation, but in Ky. most or all material that has been named *tetragona* appears closer to *glauca*. B's records of *tetragona* are provisionally grouped here with *glauca*; those of Munz (1937, 1965) still need to be reexamined.

There is an obscure 1836 coll. of what seems to be typical *tetragona* by C.W. Short (GH), apparently sent from Ky., with a note: "*Oenothera fraseri/fruticosa*? I am most perplexed by this genus. Have you any well-determined species in Florida?" Some plants from Appalachian riverbanks can key to *O. tetragona* var. *longistipata* (Pennell) Munz, but that that taxon appears to be at least transitional to *fruticosa* (F, K);

0330--*Oenothera tetragona* Roth var. *sharpii* Munz T

Onagraceae: *Oenothera* <*Kneiffia*> *tetragona* var. *sharpii*

This taxon was described from Ky., Tenn. and Ala. It may be somewhat intermediate between *tetragona* and *fruticosa*, with a mixture of glandular and non-glandular hairs on the capsule; but flowers are relatively small, and leaves are less elongated, and distinctly velutinous (W). It was reported from EDMO, FLEM and HARD by Munz (1965), but colls. have not yet been located.

0331--*Oenothera fruticosa* L.

Onagraceae: *Oenothera* <*Kneiffia*> *fruticosa* (ssp. f.*, ?*brevistipata*)

This is reportedly a widespread, variable southeastern species of open grassy areas on acid soils ($2n = ?28, 42$ and 56). However, there has been much confusion with plants known as *tetragona*, partly due to complex nomenclature that remains somewhat unresolved; see also *fraseri*. The "*fruticosa* group" may differ from the "*tetragona* group" (including *fraseri*) in their capsules, dense with mostly nonglandular hairs (versus sparse glandular hairs); also, leaves are densely pubescent (versus glabrous or sparsely pubescent). Capsules are typically clavate, widest above the middle, with a ca. 3-10 mm stipe (versus oblong, widest near the middle, with stipe less than 3 mm). There are various intermediate conditions and mixtures of characters.

Plants known as *O. tetragona* var. *brevistipata* (Pennell) Munz may be transitional from *fruticosa* to *tetragona*, with capsules that have a mixture of glandular and non-glandular hairs, and shorter stipes. These have been reported from Ky. (Munz 1965; W), but colls. are unknown.

HAB f-10,7 B 4. **ABU** g9 s7 -3.

0332--*Oenothera pilosella* Raf.

Onagraceae: *Oenothera* <*Kneiffia*> *pilosella* (*fruticosa* var. *hirsuta*)

This midwestern species may be somewhat adventive in southeastern states; it is an octoploid segregate of the *fruticosa* group ($2n = 56$).

HAB F-10? D? 5. **ABU** g9 s7? -3.

0333--*Oenothera linifolia* Nutt.

Onagraceae: *Oenothera* <*Kneiffia*> *linifolia*

This is a distinct diploid of seasonally dry sandy soils in southeastern states. It is generally uncommon east of the Mississippi, where adventive status is suspected in some areas (W). In Ky. the species appear to be relative conservative and associated with remnants of xeric or xerohydric grassy openings.

HAB f-10,12 ::+ B 6. **ABU** g10 s2 -5?

0334--*Oenothera speciosa* Nutt.

Onagraceae: *Oenothera* <*Hartmannia*> *speciosa*

This western diploid may not be native, but it is often cultivated as an attractive "wildflower." Some records may come from plantings, but it has become locally naturalized. The earliest record is from Gm in 1914: "sometimes seen growing abundantly in pastures. Local and not common, taking the State as a whole. Native."

ALI W. **HAB** F-10 ::: D? 6. **ABU** +4.

0335--*Oenothera triloba* Nutt.

Onagraceae: *Oenothera* <*Lavauxia*> *triloba*

This is scattered across south-central states, on calcareous sites with little slope and significant puddling early in the growing season but xeric later (Munz 1965; K, W). It tends to be associated with disturbed field margins or roadsides, and is rather infrequent in completely undisturbed rocky glades.

The plant is generally a winter-annual, forming a leafy rosette that puts up a series of large flowers in Apr-Jun with calyx tubes (hypanthia) up to 10-15 cm long. Proper stems are only 0-1 cm long, with individual fruits (capsules) that accumulate into a tight sessile, slightly woody cluster on the ground, often 5-10 cm long and wide. The plant dies after flowering, but fruits persist for more than year, superficially resembling a pine cone, and gradually weathering but rarely collected or associated with herbarium specimens. Capsules open during rain, when the non-dormant seeds are dispersed by splashing (Walck & Hidayati 2007).

HAB r-12 == E 6. **ABU** g8 s5 -3?

0336--*Gaura filipes* Spach

Onagraceae: *Gaura* [*Oenothera*] *filipes* (?var. major)

In Ky. this perennial is probably all var. major Torr. & Gray, which has not been distinguished from typical *filipes* in recent treatments but deserves further attention (Munz 1938, 1965; F). Var. major has larger petals (ca. 6 mm long versus 4-5 mm), larger calyx segments (8-10 mm long versus 5-7 mm), and larger leaves (mostly 3-7 cm long versus 2-5 cm). It occurs mostly in the Interior Low Plateaus (except the Bluegrass region) and perhaps other calcareous localities in southeastern states. In Ky. it is restricted to calcareous glades or nearby, whereas the habitat for typical *filipes* further south is "sandy pine-barrens" (F) or "sandy fields, disturbed areas and clearings" (W).

Reports from Ky. of the southern biennial, *G. angustifolia* Michx., have probably been based on *filipes* (M). There has also been confusion with *longiflora* in southeastern states; see notes under that name. Identifications can be unreliable when based simply on stipe length, which is usually (0.5) 1.5-3 (4) mm in *filipes*, versus usually 0-1 mm in other native eastern species, but often up to ca. 2 mm in some *longiflora* and *angustifolia*. The slender "clavate-obovoid" shape of the fruit in *filipes* is also important to note; in other eastern species, the shape is fusiform to ovoid and usually less tapered to the base.

HAB 12,10 D 5. **ABU** g8? s8 -3.

0337--*Gaura coccinea* Pursh

Onagraceae: *Gaura* [*Oenothera*] *coccinea*

This is a widespread western perennial ("spreading by roots") that spreads rarely as a waif into eastern state, but it is virtually unknown in southeastern states (F, Cr, W), There is a coll. from CALL by R. Athey (EKY): #2623, 29 Sep 1973, dry upland openings in Croppie Hollow Subdivision off Ky. 614. This locality is well known for other rare plants, and the uplands probably have a history of open grassy woodland before settlement. Native status is possible for the plant here.

ALI w. **HAB** 12,10? ::? D? 5. **ABU** g10 s1? -1?

0338--*Gaura biennis* L.

Onagraceae: *Gaura* [*Oenothera*] *biennis* (var. b.)

Variation in this widespread northeastern biennial needs further study. In Ky. it occurs typically within transitions from low woods to fields, often at upper edges of floodplains. However, across its range the species varies greatly in habitat, leaf width and flower size (Munz 1965). Superficially distinct plants grow in the xeric dolomitic glades of se. CLAR (JC for KY) and Adams Co., Ohio (e.g. colls. of A. Cusick at Ohio State Univ.), and in dry sites elsewhere. These plants tend to have unusually small flower parts and narrow leaves (no more than ca. 8-10 mm).

G. biennis, together with the more midwestern *longiflora*, the more southeastern *G. angustifolia* Michx. and related western species, appear to form an intergrading complex; $2n = 14$ in these and most other species of *Gaura*. However, *biennis* has unusually complex chromosomal structure, which may reduce hybridization (Raven & Gregory 1972).

HAB 10,4,1 ::? D 4. **ABU** g9 s8 -3.

0339--*Gaura longiflora* Spach

Onagraceae: *Gaura* [*Oenothera*] *longiflora* (filiformis; biennis var. *pitcheri*)
 This has a broad lower midwestern range, mostly from Ill. and Mo. to Lou. and e. Tex., but also locally common in w. Tenn., n. Miss. and perhaps elsewhere east of the Mississippi Rv. *G. longiflora* is mapped here based only on two colls. from roadsides in CALL (Munz 1965; Raven & Gregory 1972; M). It overlaps in range slightly with the more northeastern *biennis*, which is often confused, and hybridization has been reported (Raven & Gregory; Cr).

G. longiflora differs from typical *biennis* in its stems, usually strigulose with dense ascending hairs (versus villous with more spreading hairs); there are also spreading glandular hairs in the inflorescences of some populations (e.g. Munz's var. *kearneyi*), but in *biennis* such hairs are predominant and stigulose hairs are lacking. Also, *longiflora* has rather stiffly erect inflorescence branches (versus more long-flexuous), with plants usually reaching 1.5-4 m in height (versus 1-2 m); stems dry to a relatively pale or mottled brown to reddish (versus more uniform, darker purplish). Leaves are mostly smaller (the larger ones ca. 10-15 mm wide versus 15-25 mm), and they dry to a pale, greyish green color (versus darker, orange-brownish green). Fruits have 2-4 seeds, and often sharp angles (versus 3-6 seeds and consistently rounded angles). See also notes under *filipes*.

HAB 10? ::? D? 6? **ABU** g8? s3? -5.

0340--*Gaura parviflora* Dougl. ex Lehm. W

Onagraceae: *Gaura* [*Oenothera*] *parviflora* (*mollis*)
 This is a widespread western species that may only be an occasional adventive waif in most eastern states. There is only one Ky. record: a coll. from JEFF (DHL), P.A. Davies #491, 4 Aug 1943, moist woods, Bear Grass Creek. *G. mollis* James is an incorrect name (W).

ALI W. **HAB** H-10? ::? C? 6?

0341--*Calylophus serrulatus* (Nutt.) Raven

Onagraceae: *Calylophus* [*Oenothera*] *serrulatus*
 This species of dry western regions may just be adventive in eastern states (F). The only Ky. record is a coll. from a roadside in FULT (SIU): O'Dell & Windler #542, 30 Jun 1962; see also Mohlenbrock et al. (1966).

ALI w? **HAB** R-1,10? D? 5. **ABU** g10 s2? +1?

0342--*Circaea canadensis* (L.) Hill

Onagraceae: *Circaea canadensis* (*quadrisulcata*, *lutetiana* ssp. *c.**)

This is a widespread in much of eastern North America, but rare to absent on the southeastern Coastal Plain. It has been treated as a subspecies of the Eurasian *C. quadrisulcata* (Maxim.) Franch. & Savigny, but some authors have preferred to retain it as a species (Boufford 1983, 2005; W).

HAB 5,7,4 D 1. **ABU** g10 s10 -3.

0343--*Circaea alpina* L.

Onagraceae: *Circaea alpina*
 This is a northern (circumboreal) species that extends south along the Appalachians at higher elevation, and occasionally lower in cool ravines. In Ky. there are remarkable disjunct sites in a few sinkholes of the Mammoth Cave area (EDMO and HART). Apparent hybrids with *canadensis* have been reported at a few sites, and deserve further study.

HAB 5,4 / A 1. **ABU** g10 s5 =.

0344--*Lechea racemulosa* Michx.

Cistaceae: *Lechea racemulosa*
 This is largely Appalachian but disjunct to the west as far as La., Mo. and Iowa (Y, PL). Disjunct records in w. Ky. are all confirmed. See also note about possible confusion under *minor*.

HAB 12,11,10 ::? A 4. **ABU** g9 s8 -1.

0345--*Lechea minor* L.

Cistaceae: *Lechea minor*
 This is distributed mostly on the Gulf and Atlantic Coastal Plains, and around the Great Lakes. Although absent from most of the southern Appalachians (W), it does occur locally on the Cumberland Plateau (see also Ch) and in the Cumberland Mountains (but not found by B). *L. minor* grows on sandy soils in open pine woods or their disturbed remnants. It has probably been confused occasionally with *racemulosa* and colls. under the latter name should be rechecked.

HAB 10,12,11 ::? A 4. **ABU** g9 s4? -3?

0346--*Lechea mucronata* Raf.

Cistaceae: *Lechea mucronata* (*villosa*)
 This is widely scattered in eastern states but its range is curiously fragmented. It is generally absent in Appalachian regions, except for occasional disjunct records (PL). In Ky. the only Appalachian record is a coll. from ROWA (MDKY) but the label data may be doubted (Campbell et al. 1992).

HAB 10,12,11 ::? B 4. **ABU** g9 s8 -3.

0347--*Lechea tenuifolia* Michx.

Cistaceae: *Lechea tenuifolia*

This is widespread in eastern states, but generally absent from Appalachian regions (PL). At the edge of the Appalachian Plateaus in Ky., there is a coll. of *tenuifolia* from ROWA (B), and it is also known from nearby in se. Ohio.

HAB 12,11,10 +: A 4. **ABU** g9 s8 -1.

0348--*Crocianthemum canadense* (L.) Britt.

Cistaceae: *Crocianthemum* [*Helianthemum**] *canadense*

This occurs in northeastern, Atlantic coastal and locally in the Blue Ridge, but it is rare in the Ohio River watershed. In Ky. it is known only from Pine Mt. in HARL, where discovered by Kearney (1893) and rediscovered a century later by M. Evans (KSNPC). The species might also be expected in western regions of the state, since it is known from s. Ohio, s. Ind. and s. Ill. (K); Short (1840) reported it from Harrison Co., Ind.

HAB 12,10 +? B 4. **ABU** g9 s2 -2?

0349--*Crocianthemum bicknellii* (Fern.) Barnh.

Cistaceae: *Crocianthemum* [*Helianthemum**] *bicknellii*

This is widely scattered from northeastern states to the Rockies, but most common in the mid-west. It is rare across its southeastern borders. It grows in various types of opening, but usually on less acid infertile soil than *canadense*. In Ky. it only occurs in remnants of grassy open woods or "barrens" in or near the Pennyrhile Karst Plain, usually on cherty or sandy soils above limestone.

HAB 10,12 ::? C 4. **ABU** g9 s3 -4.

0350--*Tilia heterophylla* Vent.

Tiliaceae [Malvaceae]: *Tilia heterophylla* (*americana* var. *h.**; *monticola*, *michauxii*)

Included here are records of Jones (1968), (as triangles) Little (1971), and (as open dots) Gm. Much variation within North American *Tilia* appears to be continuous (Hickok & Anway 1972, Hardin 1990). Several colls. mapped here (including BALL at KY) are less densely stellate-pubescent than typical plants, suggesting transitions to *americana*, or perhaps just shade leaves. For some purposes, it is reasonable to treat these taxa as varieties or subspecies of one North American *Tilia* species, together with the southeastern *T. carolinianum* P. Mill. and the Mexican *T. mexicana* Schltr.

The largely Appalachian *heterophylla* is distinguished by "a predominance of stellate or fasciculate trichomes [hairs]" on lower leaf surfaces, peduncles and pedicels; simple "acicular" hairs are also present (Hardin 1990). The largely northeastern *americana* typically has only acicular hairs, but in apparent introgressants, the more complex hairs are mixed to various degrees. Ky. and Tenn. (Ch) are in the zone of overlap between these two taxa, and there is probably much genetic exchange. They have similar distributions in Ky. and Tenn., both being rare to absent in much of the Mississippian Plateaus and Coastal Plain. In the original forests of Ky., *Tilia* was most common in Appalachian regions; it was much less common elsewhere, except locally in ravines along the Ohio Rv. and its major tributaries (Barton 1919, Campbell 1989).

HAB 5,7,11 D 1. **ABU** g9 s9 -2.

0351--*Tilia americana* L.

Tiliaceae [Malvaceae]: *Tilia americana* (var. *a.**, *neglecta*)

Included here are the data of Jones (1968), (as triangles) Little (1971), and (as open dots) Gm. See notes under *heterophylla*, which intergrades in Ky. Much of the intermediate material has been previously treated as var. *neglecta* Spach (or even a species). A few colls. of B were referred to more glabrous forms of *T. caroliniana* P. Mill., but this was erroneous (Jones 1968, Hardin 1990); they are included here as uncertain records of *americana*, but probably transitional to *heterophylla*.

HAB 5,7,6 D 1. **ABU** g10 s9 -3.

0352--*Malva moschata* L.

Malvaceae: *Malva moschata*

This perennial with large flowers is sometimes cultivated (as "musk-mallow") and may escape, especially in northern regions (Cr, PL).

ALI EU. **HAB** R-10? ::: C? 6. **ABU** +4.

0353--*Malva sylvestris* P. Mill. C

Malvaceae: *Malva sylvestris*

This biennial may just be a rare escape from cultivation (as "high mallow"), with colls. from JEFF (MM for WKY, and Ind. Univ. SE) and PIKE (NCU). The former has been referred to var. *mauritiana* (L.) Boiss., which is not recognized in recent treatments.

ALI EU. **HAB** R-10? ::: D? 6. **ABU** +4.

0354--*Malva neglecta* Wallr.

Malvaceae: *Malva neglecta* ("rotundifolia")

This annual or biennial weed became established early after settlement. Short (1928-29) noted: "An exotic originally, now so thoroughly naturalized as to be met with every where in cultivated grounds and neglected wastes."

Two closely related Eurasian species with relatively small flowers are also expected, especially in western or southern regions: *M. pusilla* Smith (= *M. rotundifolia* L.), and *M. parviflora* L. The latter was reported by BA but no coll. has been found; it has relatively pale petals and linear bractlets (W).

ALI EU. **HAB** R-10 ::: E 6. **ABU** +5.

0355--*Sida hermaphrodita* L.

Malvaceae: *Sida* <*Pseudonapaea*> *hermaphrodita* (*Napaea* h.)

This has a curiously fragmented northeastern range: mostly on bottomlands in and around the central Appalachian region, and locally common along the Ohio Rv. downstream to the greater Cincinnati area. It can be somewhat weedy in gardens but is much sought after by larger herbivores, from woodchucks to cattle. It is one of the tallest perennial herbs in Ky., sometimes reaching 4-5 m on rich damp soil at edges of riparian woods. This remarkable species has some similarities to the South American genus, *Sidasodes*, and probably deserves its own genus (W; J. Beck et al., Univ. of Tenn., pers. comm.).

HAB 1,4,7 D 4. **ABU** g5 s4 -4.

0356--*Sida elliotii* Torr. & Gray

Malvaceae: *Sida* <*Ellipticifolia*> *elliotii*

This southeastern species occurs in various kinds of openings, including disturbed ground of farmland. In Ky. it is known only from colls. of R. Athey, ca. 1960-80, which need to be rechecked (presumably at MEM).

ALI s. **HAB** H-10 ::: D? 6. **ABU** +4.

0357--*Sida rhombifolia* L.

Malvaceae: *Sida* <*Sidae*> *rhombifolia*

This is a variable pantropical weed, with a center of diversity in east Africa (Verdcourt 2004). The first Ky. records date from the 1970s (M).

ALI s. **HAB** H-10 ::: C? 6. **ABU** +4.

0358--*Sida spinosa* L.

Malvaceae: *Sida* <*Spinosa*> *spinosa*

This pantropical weedy annual invaded eastern states from the south to become common by the mid-1800s (Gray 1864; Gm).

ALI S. **HAB** H-10 ::: D 6. **ABU** +6.

0359--*Napaea dioica* L.

Malvaceae: *Napaea dioica*

This occurs in riparian woods from Va. and Pa. to Wis. and Iowa. In Ky. it was reported from "a single station on the bank of Gun Powder Creek" (BOON) by Nelson (1919). Although no coll. has been located, this record is reasonably reliable considering that it is known nearby at several sites in sw. Ohio.

HAB 1,4,7? E 4. **ABU** g6 s1 -6?

0360--*Malvastrum angustum* Gray

Malvaceae: *Malvastrum* <*Sidopsis*> [*Sphaeralcea*] *angustum* ("hispidum")

This annual mostly occurs on calcareous soils in Mo. and Kans., plus parts of adjacent states. There are disjunct eastern clusters of records from glades of c. Tenn., barrens of w. Ky., and rocky pastures of nc. Ky. (Hill 1982; PL). In Ky. most records date from before 1970 and the species seems to have been generally reduced due to succession or various artificial developments. Although usually found on rocky sites in Ky., it is known from alluvial sites further west.

Malvastrum is a widespread, rather weedy genus of wet tropical regions. *M. hispidum* is anomalous in several characters. It may deserve treatment as the monotypic genus, *Sidopsis*, with the name *S. hispida* (Pursh) Rydb. (Hill 1982; p. 169).

HAB g-12,10 == E 6. **ABU** g6? s4 -4.

0361--*Modiola caroliniana* (L.) G. Don

Malvaceae: *Modiola caroliniana*

This is a weed of warmer American regions. JC was lucky to be present in 2005 for the coll. from Ky. in MCRE (KNK), perhaps the last new state-record of our beloved, lately deceased John Thieret. At the first stop on a grand tour, JT spotted it at the edge of the parking lot behind the Stearns restaurant. It persisted here for at least 5 years.

ALI S. **HAB** S-10 ::: D? 6. **ABU** +4.

0362--*Callirhoe involucrata* (Torr. & Gray) Gray W

Malvaceae: *Callirhoe involucrata*

This occurs widely in the Great Plains, and it is rarely adventive to the east. The only Ky. record is a coll. from FAYE (KY-Agr.): H. Garman, 27 May 1908, "from *Agropyron occidentalis* Plot" [apparently a waif in grass seed from the west].

ALI w.

0363--*Callirhoe alcaeoides* (Michx.) Gray

Malvaceae: *Callirhoe alcaeoides*

This occurs mostly in the central Great Plains, and it may be native east to s. Ill. and w. Tenn. (Ch, PL). In Ky. the only certain record of this western species is a coll. of A. Michaux (Paris) from BARR or ALLE in 1795: "barren oaks endica de Big Barren River" (M). There is also a coll. of C.W. Short (PH) but without data.

HAB r-10 ::? D? 6? **ABU** g9 s0 -6.

0364--*Alcea rosea* L.

Malvaceae: *Alcea* {*Althaea*} *rosea*

This old horticultural favorite ("hollyhock") has been widely grown in Ky. since Virginian settlement. Although apparently persistent from old gardens at some sites, it is not clear if plants are truly spreading from seed.

ALI EU. **HAB** F-10,8 ::? D? 4. **ABU** +5.

0365--*Abrus precatorius* Medik.

Malvaceae: *Abrus precatorius*

This tall alien annual weed was present early after settlement (Short et al. 1833; M), and it soon became a common weed in cultivated ground (Gm).

ALI AS. **HAB** H-10 :::: D 6. **ABU** +6.

0366--*Anoda cristata* (L.) Schlecht.

Malvaceae: *Anoda cristata*

This largely agricultural weedy annual is native in southwestern states, Central and South America. In Ky. it was first reported by McFarland (1942).

ALI S. **HAB** H-10 :::: D 6. **ABU** +5.

0367--*Hibiscus syriacus* L.

Malvaceae: *Hibiscus syriacus*

This is a commonly cultivated shrub (as *Hibiscus*, Rose-of-Sharon or "*Althaea*"),

with much variation in flower color. Most records mapped here are probably persistent plantings at old home sites. It is not clear if the species spreads from seed.

ALI AS. **HAB** F-10,8 C? 4. **ABU** +5.

0368--*Hibiscus lasiocarpus* Cav.

Malvaceae: *Hibiscus lasiocarpus* (*moscheutos* ssp. l.*; m. var. *occidentalis*)

This close relative of *moscheutos* occurs in southern states, mostly on the Gulf Coastal Plain and in the lower Mississippi Valley. Where ranges overlap, it may tend to occur in sites with more seasonal drying. In Ky. it is known only from colls. in HICK (KY, SIU).

HAB 2,9? D? 4. **ABU** g8 s2 -3?

0369--*Hibiscus moscheutos* L.

Malvaceae: *Hibiscus moscheutos* (ssp. m.*)

This is widespread in southeastern states, extending north to Wis. and Mass.

HAB 2 D 4. **ABU** g9 s9 -2.

0370--*Hibiscus laevis* All.

Malvaceae: *Hibiscus laevis* (*militaris*)

This is widespread in eastern states, especially on or near the coast, but not in the northeast. It tends to occur in more riparian habitats than *moscheutos*, especially along larger rivers and sloughs.

HAB 2,1 C 4. **ABU** g9 s8 -2.

0371--*Hibiscus trionum* L.

Malvaceae: *Hibiscus trionum*

This weedy annual is widely scattered in eastern North America. In Ky. it was first reported by Linney (1880) and Pr.

ALI EU. **HAB** H-10 :::: D 6. **ABU** +5.

0372--*Abelmoschus esculentus* (L.) Moench C

Malvaceae: *Abelmoschus* [*Hibiscus*] *esculentus*

This widely grown vegetable (okra) occasionally persists for a year or so in or near gardens, but it is not naturalized. Chester (1992) found it on a "dump" in LYON.

ALI AF.

0373--*Dirca palustris* L.

Thymelaeaceae: *Dirca palustris*

This occurs in much of eastern North America, but it is not generally common, largely restricted to somewhat base-rich soils, and rare to absent on much of the Coastal Plain. Mapped here as open dots are the data of Gm and B. *Dirca* is easily overlooked and probably more widespread in Ky. than indicated by colls. In the "Walden Woods" of METC and similar sites, it is locally common in open understories around the upper fringes of mesic wooded ravines, where deer may browse selectively on more palatable species. *Dirca* spp. are small shrubs known to spread with rhizomes (Graves 2004), and they are generally toxic or repellant to generalist herbivores. **HAB** 7,11,5,4 D 2. **ABU** g10 s9 -2.

0374--*Zanthoxylum americanum* P. Mill.

Rutaceae: *Zanthoxylum americanum*

This is widely scattered in eastern North America, it becomes uncommon to rare in southeastern states, where replaced by the infamous *Z. clava-herculis* L. *Zanthoxylum* spp. are among the few woody species of temperate regions that combine both thorniness and browsing-repellant chemistry; see also *Maclura pomifera*.

In Ky. *americanum* is widely scattered but locally common in relatively few localities, especially on base-rich soil in thorny scrub around old pastures. Its distribution in Ky. and Tenn. is somewhat similar to the original concentrations of *Juniperus virginiana*, as documented by Barton (1919) and others. It is unusually abundant near the J.K. Smith power plant in CLAR. And on ridges above Slate Creek near Howards Mill in MONT, stems are up to 4 m tall and 10 cm thick.

HAB 8,12,7 E 4. **ABU** g9 s8 -3.

0375--*Ptelea trifoliata* L.

Rutaceae: *Ptelea trifoliata* (var. t.)

This is ranges widely over southeastern states (north to N.J. and Neb.), but it is patchily distributed, apparently associated with areas that have a long history of brushy openings in the woods. Although usually found on rocky calcareous sites, it can also occur on deeper soils, where its running roots and low palatability may allow it to resist local disturbance from browsing.

HAB 12,8,11,7 E 4. **ABU** g9 s8 -2.

0376--*Citrus trifoliata* L. R

Rutaceae: *Citrus* <*Poncirus*> *trifoliatus*

This distinctive thorny evergreen shrub occurs widely in warmer regions of southeastern states, and is locally abundant on the Gulf Coastal Plain (W). It was reported from Ky. by BA, but without details and no colls. have been located. It has been mapped from w. Tenn., s. Ill. and s. Mo. (K, SE).

ALI AS.

0377--*Leitneria floridana* Chapm. R

Simaroubaceae (Leitneriaceae): *Leitneria floridana*

This unique, largely dioecious root-suckering shrub, with unusually light wood, is known from scattered disjunct localities in thin marshy woods and shores along rivers and sloughs on the Gulf Coastal Plain (K). It is documented as far north as se. Mo., but no colls. are known from Ky. or Tenn. According to an "old forester" from western Kentucky, "cork bush" used to grow on natural levees of the Mississippi River in FULT before the flood dikes were built (R. Athey, pers. comm. in 1983 to M). There is also an old unverified report from near Memphis, Tenn. (D. Estes, pers. comm.).

0378--*Ailanthus altissima* (P. Mill.) Swingle

Simaroubaceae: *Ailanthus altissima*

This infamous, malodorous Chinese tree was grown initially as an exotic ornamental, but has become widely naturalized in thin woods, edges and abandoned built-up sites, especially where repeated cutting or browsing occurs. It is remarkably persistent through widely spreading root suckers that proliferate after larger stems are removed. The first report from Ky. that suggests naturalized status was by Hussey (1876).

ALI AS. **HAB** f-8,7,11,5 D 4. **ABU** +6*.

0379--*Cotinus obovatus* Raf. R

Anacardiaceae: *Cotinus obovatus*

This is largely restricted to rocky calcareous sites of the Edwards Plateau (Tex.), the Ozark region (Ark., Mo., Okl.), and the southern Highland Rim (Ala., Ga., Tenn.). It was collected in DAVI by E.J. Palmer (#17829 at GH) on 10 Jun 1920 from "high alluvial banks of the Ohio River just below Owensboro... However, it may have been a more recent introduction there, as it is usually found only in rocky ground and along bluffs" (Palmer 1927). Baskin & Baskin (1989) reviewed the context of this coll. and suggested that it was from a cultivated plant, but M considered their argument insufficient to reject the species from Ky.'s flora.

ALI w. **HAB** 12? E? 4. **ABU** g8 s1? -6?

0380--*Toxicodendron radicans* (L.) Kuntze

Anacardiaceae: *Toxicodendron* [*Rhus*] *radicans*

This occurs across eastern North America and elsewhere. Although widespread across Ky. and locally abundant, this infamous species ("poison ivy") is curiously infrequent at some west-central localities. It is eaten by livestock, which perhaps reduce it after long periods of intensive browsing. Variation needs more study. Most plants in Ky. have glabrous fruit and moderately hairy to glabrous leaves, matching the largely midwestern var. *negundo* (Greene) Reveal.

Var. *radicans*, with papillate to hairy fruit but largely glabrous leaves, is more common east of the Appalachians, especially on the Atlantic Coastal Plain (Cr); it was reported by Gillis (1971) from BELL to TRIG (Mich. State Univ.). Var. *pubens* (Engelm. ex S. Wats.) Reveal, with glabrous fruit but velutinous leaves, occurs mostly in the lower Mississippi Valley, especially on dry calcareous sites west of the river; it was reported by Gillis (1971) from FAYE in Ky. and Rutherford Co., Tenn. See also notes under *R. pubescens*.
HAB 7,8,4,6 D 3. **ABU** g10 s10 +1?

0381--*Toxicodendron pubescens* P. Mill. R

Anacardiaceae: *Toxicodendron* [*Rhus*] *pubescens* (*R. toxicodendron*, *toxicarium*)

This largely southeastern species (the eastern "poison oak") is known north to s. Mo, s. Ill., c. Tenn. and s. W.Va., especially in thin woods on dry sandy soils (Gillis 1971). In Ky. it has been reported from BRAC, HARR and MARI (EKY), but colls. were not complete enough for verification (Clark & Bauer 2001; CW). Somewhat shrubby forms of *radicans* have often been confused with *pubescens* or with the western and northern *T. rydbergii* (Small) Greene, which does occur at high elevation in the Blue Ridge area.

Both of these "poison oaks" have a strictly shrubby, stoloniferous habit, only 0.5-6 dm tall with no potential for aerial roots as in *radicans* (F, Cr, Y, W). Their leaves (F) are "approximate on long erect petioles at summit of stems and branches, thus appearing falsely verticillate" (versus "alternately scattered"). Leaflets of *pubescens* usually have 3-7 blunt lobes or deep teeth (versus acutely shallow-lobed, dentate or entire in *rydbergii* and *radicans*). Fruits, lower leaf surfaces and petioles of *pubescens* are usually hairy (or papillate), whereas those of *rydbergii* are less hairy to glabrous; *radicans* (*sensu lato*) is highly variable in pubescence.

0382--*Toxicodendron vernix* (L.) Kuntze

Anacardiaceae: *Toxicodendron* [*Rhus*] *vernix*

This is widely scattered across eastern North America, but largely restricted to regions with extensive boggy wetlands, and generally rare in the Ohio and central Mississippi Valleys (PL). It has been collected during recent decades in CART (KY) and MCRE (EKY). There are also unverified older reports from BARR/EDMO (Hussey 1876), FAYE (M. Flynn, pers. comm.), and perhaps elsewhere; Gm (1914) noted "not a common plant in Kentucky."
HAB 6,9 B 4. **ABU** g10 s2 -3.

0383--*Rhus aromatica* Ait.

Anacardiaceae: *Rhus* <*Lobadium*> *aromatica* (*canadensis*)

This is a variable, widespread eastern species. Records mapped here include more pubescent plants that have been called var. *illinoensis* (Greene) Rehd., with colls. from PULA and perhaps CART (B). However, it remains uncertain if that midwestern segregate occurs in Ky. (F, Cr).

HAB 12,11,8 E 4. **ABU** g10 s9 -1.

0384--*Rhus glabra* L.

Anacardiaceae: *Rhus glabra*

This is widespread across temperate regions of North America.

HAB f-8,10 D 4. **ABU** g10 s10 +2?

0385--*Rhus typhina* L.

Anacardiaceae: *Rhus typhina* (*hirta*)

This northeastern species is widely scattered across Ky., but it is frequent only in northeastern counties along the Ohio Rv. Although *R. hirta* (L.) Sudworth is based on an earlier epithet that Reveal (1991) showed to be entirely valid, the mysterious International Code of Botanical Nomenclature rejected it for unspecified reasons (Appendix V in <http://ibot.sav.sk/icbn/main.htm>).

HAB f-8,10,7 D 4. **ABU** g9 s8 +1?

0386--*Rhus copallinum* L. var. *latifolia* Engl.

Anacardiaceae: *Rhus copallinum** var. *latifolia*

This is widespread across eastern North America; var. *copallinum* is largely restricted to Atlantic states (PL). The spelling *copallina* is incorrect (Y, W).

HAB f-8,10,12 C 4. **ABU** g10 s10 +2?

0387--*Cardiospermum halicacabum* L.

Sapindaceae: *Cardiospermum halicacabum*

This is widely scattered on lowlands in southeastern states on lowlands, especially the Gulf Coastal Plain. It is generally considered to be an invader from warmer regions (Sm, F, W). The plant has medicinal uses, and has been cultivated. There appear to have been no records from Ky. before Browne & Athey (1978).

ALI S. HAB 4,1 ::? E? 4? **ABU** +5.

0388--*Koelreuteria paniculata* Laxm. C

Sapindaceae: *Koelreuteria paniculata*

Occasional self-seeded plants of this commonly cultivated species ("golden-rain tree") have been collected in CLIN, BOYL (CW), FAYE (TENN) and JEFF (DHL). However, there do not seem yet to be increasing naturalized populations.

ALI AS. HAB 8,7? D? 4? **ABU** +4.

0389--*Acer floridanum* (Chapman) Pax

Aceraceae [Sapindaceae]: *Acer* <Saccharina> *floridanum* (*barbatum**, *saccharum* var. f.)

This is a southeastern taxon that may intergrade with typical *saccharum* in a clinal fashion (W). It has smaller leaves (3.5-11 cm wide versus 8-20 cm), often relatively blunt-lobed, and always densely pubescent below (versus usually smooth). Mature trees tend to be smaller, usually with smooth gray bark (versus increasingly plated with age, grayish-brown to pinkish). Pedicels, flowers and fruits are reportedly smaller (F), but these have not been thoroughly collected in Ky. W has accepted Ward's (2004) case that *floridanum* be selected rather than *barbatum* as the appropriate name.

In Ky. relatively pure populations appear to occur on the loess bluffs along the Mississippi Rv., but even these do not generally have leaves as small and as tomentose as typical plants in more southern states. Open dots mapped here are based on colls. that appear to be at least transitional to typical *saccharum* or perhaps var. *schneckii*. See also Clark et al. (2005; CW) for recent collection data.

HAB 5,11? D 1. **ABU** g9 s7? -3.

0390--*Acer saccharum* Marsh. var. *saccharum*

Aceraceae [Sapindaceae]: *Acer* <Saccharina> *saccharum* var. sa.

This widespread eastern species needs further revision for precise mapping of its segregates and relatives; see also notes under *floridanum* and *nigrum*.

HAB 5,7 D 1. **ABU** g10 s10 -3.

0391--*Acer saccharum* Marsh. var. *schneckii* Rehd.

Aceraceae [Sapindaceae]: *Acer* <Saccharina> *saccharum* var. *schneckii* (?*rugellii*)

This tentatively distinguished variant may be distinguished from typical *saccharum* by its densely pubescent lower leaf surfaces and petioles, and by its relatively blunt leaf lobes with few secondary teeth (St, Y). Some of these trees may just be transitional to *nigrum* or *floridanum*. Var. *schneckii* is centered in midwestern regions, but even there it may not be clearly distinct. Unusual forms with small leaves, including some that have been named var. *rugellii* (Pax) Rehd. (at least transitional to *floridanum*), are probably not worth taxonomic recognition (Cr).

HAB 5,11? D 1. **ABU** g8? s8? -2?

0392--*Acer nigrum* Michx. f.

Aceraceae [Sapindaceae]: *Acer* <Saccharina> *nigrum* (*saccharum* var. n.)

This largely midwestern taxon has been confused with *saccharum* and *floridanum*; further revision is needed in Ky. In addition to its distinctive leaves (F, Cr, J, W), *nigrum* can often be distinguished by its dark brown or blackish bark, becoming furrowed in larger trees. Typical *saccharum* has grayish-brown bark, or often slightly pinkish in older trees. remaining platy in larger trees. In Ky. *nigrum* is usually concentrated on relatively moist or fertile sites, but further west it is often reported from relatively dry or fire-prone sites (Y).

A. nigrum is often treated as a subspecies or variety of *saccharum*, since transitions are locally frequent, sometimes named "var. *schneckii*" further west (Y). Intergradation is also suspected in some trees of the Bluegrass of Ky., but Gm noted that *nigrum* was distinct, locally predominant and typical of this region's old woodland pastures. In this region, Short (1828-9) did not separate *nigrum* from *saccharum*, noting: "The Sugar tree, as it is here universally called, is one of the most common of our forest trees, and perhaps in this particular locality, it attains its greatest altitude. As it does not materially interfere with the growth of grasses beneath it, it is often reserved in clearing ground, particularly in situations intended for pasture or meadows."

HAB 5,7,4 E? 1. **ABU** g9 s9 -3.

0393--*Acer pseudoplatanus* L. C

Aceraceae [Sapindaceae]: *Acer* <Spicata> *pseudoplatanus*

This is the European "sycamore." There may be rare self-seedings from cultivated trees, but it is not known to be truly naturalized. There is a coll. of dubious status from JEFF (DHL).

ALI EU.

0394--*Acer ginnala* Maxim.

Aceraceae [Sapindaceae]: *Acer* <Spicata> *ginnala* (*tataricum* ssp. g.)

This small shrubby tree ("Amur maple") is occasionally cultivated and has become locally naturalized in BULL (KY) near the arboretum at Bernheim Forest, and perhaps in OLDH (DHL). Further monitoring is needed for this potential problem.

ALI AS. **HAB** 5,7,11? C? 3? **ABU** +4.

0395--*Acer spicatum* Lam.

Aceraceae [Sapindaceae]: *Acer* <Spicata> *spicatum*

This small tree of northeastern regions is rare in Ky., with records generally coming from cool sites near cave entrances, in narrow ravines, or at high elevation. Several records are obscure, and further verification is needed. The only plants that have been fully documented since 1990 are in CART, ELLI and PULA; see also KSNPC database.

HAB 5 D 2. **ABU** g10 s2 -1?

0396--*Acer pensylvanicum* L.

Aceraceae [Sapindaceae]: *Acer* <Macrantha> *pensylvanicum*

In Ky. this northeastern species is known only from upper slopes of the Cumberland Mts. and in ravines along the South Fork of Cumberland Rv.

HAB 5 C 1. **ABU** g10 s7 =.

0397--*Acer platanoides* L.

Aceraceae [Sapindaceae]: *Acer* <Platanoidea> *platanoides*

This frequently planted tree ("Norway maple") occasionally establishes from self-seedings. The more certain records mapped here (with solid dots) are from contexts that suggest true naturalization is under way, but details are lacking in several cases. It is not clear yet if this species is completing life-cycles in the wild.

ALI EU. **HAB** 7? D? 2? **ABU** +5*.

0398--*Acer campestre* L. R

Aceraceae [Sapindaceae]: *Acer* <Platanoidea> *campestre*

This common European maple is occasionally planted and has been reported as an escape in JEFF (herbarium of Ind. Univ. SE) and MADI (CW), but details are not yet available. It is becoming locally naturalized on base-rich soils in northeastern states, including the Greater Cincinnati area (pers. obs.) and other parts of Ind. and Ohio (PL).

ALI EU.

0399--*Acer saccharinum* L.

Aceraceae [Sapindaceae]: *Acer* <Rubra> *saccharinum*

This widespread eastern species was originally native to riparian zones, but it became much used on uplands for residential plantings at least a century ago (Gm). Open dots include colls. with uncertain native versus adventive status, as well as the unverified historical data of Gm and B. See notes on potential hybrids under *drummondii* and *rubrum*.

HAB 4,6,3 D 3. **ABU** g10 s10 =.

0400--*Acer drummondii* Hook. & Arn. ex Nutt.

Aceraceae [Sapindaceae]: *Acer* <Rubra> *drummondii* (*rubrum* var. d.)

This southeastern tree is most common in the lower Mississippi Valley. There are reliable records from s. Ill. and s. Ind. (ML, D, PL), but the scattered colls. from river bottoms of w. Ky. are generally not complete enough for certain verification (M, CW). *A. drummondii* is somewhat intermediate between *rubrum* and *saccharinum* in samara size (2.7-5 cm long), leaf size and shape, but its mature leaves are more or less whitish-tomentose below (versus less densely pubescent to glabrate in the other taxa; W). The possibility of intergradation among these three taxa needs to be reassessed; see also notes under *rubrum* var. *trilobum*.

HAB D? 3? **ABU** g8 s3?

0401--*Acer rubrum* L. var. *rubrum*

Aceraceae [Sapindaceae]: *Acer* <Rubra> *rubrum* var. *rubrum*

This widespread eastern species is variable, and includes high chromosome numbers ($2n = 78, 91, 104$). Moreover, there are occasional hybrids with the tetraploid *saccharinum* ($2n = 52$), as suggested by colls. from JEFF (KY, DHL). Other native species of *Acer* in Ky. are diploids ($2n = 26$). In Ky. typical *rubrum* locally abundant but largely restricted to non-calcareous soils. Moreover, it is curiously rare to absent in some regions that have a long history of disturbance from burining (e.g. Land-Between-the-Lakes) or browsing (e.g. most of the Bluegrass).

HAB 7,11,5 C 2. **ABU** g10 s10 =.

0402--*Acer rubrum* L. var. *trilobum* Torr. & Gray ex K. Koch

Aceraceae [Sapindaceae]: *Acer* <Rubra> *rubrum* var. *trilobum*

This largely southeastern taxon is typical of wet sites. It is usually distinct from typical *rubrum*, with leaves relatively small, less cordate, and shallowly 3-lobed versus more deeply 5-lobed (W).

HAB 6,9 C 2. **ABU** g10 s10 -2.

0403--*Acer negundo* L.

Aceraceae [Sapindaceae]: *Acer* <Negundo> *negundo*

This is widespread across North America, especially along riparian zones. It is generally rare to absent on infertile acid soils. In Ky., some western material is referable to var. *violaceum* (Kirchn.) Jaeger (with twigs glabrous, often glaucous), or to var. *texanum* Pax (with pubescent twigs, leaflets and fruits). However, these taxa are not generally distinguished in eastern states (W).

HAB 4,6,7 E 2. **ABU** g10 s10 =.

0404--*Aesculus hippocastanum* L. C

Hippocastanaceae [Sapindaceae]: *Aesculus* <Aesculus> *hippocastanum*

This widely cultivated tree--the se. European "horse-chestnut"--has not become truly naturalized in eastern North America. But self-seedlings do rarely appear, as in a coll. from CAMP (NCU, KNK).

ALI EU.

0405--*Aesculus pavia* L.

Hippocastanaceae [Sapindaceae]: *Aesculus* <Pavia> *pavia*

Most or all Ky. colls. of this southeastern species are referable to var. *discolor* (Pursh) Gray, which is a relatively western segregate (F) with leaves broadly elliptic to oblong-obovate, up to 4-8 cm wide (versus lance-elliptic to lance-ovate, up to 2-6 cm wide), and "velvety to tomentulose" below (versus glabrous to glabrate). However, Hardin (1957a) and others have not recognized this variety. Outlying colls. from FAYE (CW), HENR (KY) and ROWA (KY) may be atypical, and perhaps hybridized with other species. They may have come from cultivated or escaped plants; see also unverified historical reports from FLOY, MONR and SCOT (Gm; not mapped here).

Hardin (1957b) reported hybrids of *pavia* with *A. sylvatica* Bartr. from BELL (H.A. Gleason #8831 at NY) and from "southern Ky." (S.F. Price #2385 at GH), but such crosses seem unlikely in the state. *A. sylvatica* is a

more southeastern species, concentrated on the Piedmont and extending north in the Ridge-and-Valley region no further than Granger Co. in e. Tenn. (Ch).

HAB 4,5? D? 2? **ABU** g9 s3 -4?

0406--*Aesculus flava* Ait.

Hippocastanaceae [Sapindaceae]: *Aesculus* <Pavia> *flava* (octandra)

More good colls. of this largely southern Appalachian species are needed to document the western extent of its range in Ky., where it is usually confined to steeper slopes and bottoms along larger streams. Unverified historical data of Gm are included here as uncertain records (open dots). There are verified records from narrow western extensions: along the Ohio Rv. downstream to at least OLDH; along the Kentucky Rv. downstream to at least ANDE; and in the Green Rv. watershed downstream to at least HART. Within these extensions, there is some evidence of introgression with *glabra*; see notes under that species.

HAB 5,7,4 D 1. **ABU** g9 s9 -2.

0407--*Aesculus glabra* Willd.

Hippocastanaceae [Sapindaceae]: *Aesculus* <Pavia> *glabra* (*pallida*)

Without flowers or fruits, this largely midwestern species is often hard to distinguish from *flava*. Moreover, Hardin (1957b) considered that some colls. of *glabra* scattered west of the Appalachians in Ky. (BULL, FAYE, CLAR, MADI at GH), Tenn, Ohio, Ind., Ill., Mo. and Io. exhibit introgression from *flava*; see also Beatley (1979). But in many cases this conclusion was based just on the presence of stipitate glands on pedicels and perianths. Evidence of introgression is clearest close to the Appalachians, often with stamens more exerted, greater differences between upper and lateral petals, and fruit spines relatively small or irregular.

A. glabra is largely restricted to base-rich soils in Ky. In the central Bluegrass, Short (1828-9) noted: "This species is abundant throughout the forests in the rich lands of Kentucky ...it is sometimes eaten by cattle, and often with fatal effects." Past or present occurrence of *glabra* within the rugged Appalachian hills of Ky. remains uncertain. CW mapped it in CLAY and LAUR, but details are not yet available. Gm listed several other counties that are not mapped here. Yet *glabra* is known nearby from sites in s. W.Va., and more frequently in the Ridge and Valley of Tenn. and Va. (K, PL).

HAB 7,5,11 E 1. **ABU** g9 s8 -4.

0408--*Floerkea proserpinacoides* Willd.

Limnanthaceae: *Floerkea proserpinacoides*

This curious little winter-annual forms a monotypic genus that is known from woodlands of humid cool temperate regions in both eastern and western North America; $2n = 10$ (FNA 7, K). In Ky. it is locally common in the northern Bluegrass. Further south, colls. were also made during the 1830s by C.W. Short, R. Peter and others in woods near Lexington, FAYE (PH, KY-Agr.). **HAB** 4,7,5,1? ::: E 2. **ABU** g8 s5 -4.

0409--*Reseda lutea* L. R

Resedaceae: *Reseda lutea*

This biennial (or short-lived perennial) is naturalized in northeastern states, but remains virtually absent in the southeast (PL, W). It was reported from Ky. by McFarland (1942) but any coll. at KY was probably lost in the fire of 1948.

ALI EU.

0410--*Tarenaya hassleriana* (Chod.) Iltis

Cleomaceae [Capparaceae*]: *Tarenaya* [Cleome*] *hassleriana* ("spinosa")

This ornamental annual is often cultivated and it escapes into disturbed areas, but it is not a seriously invasive species. It has been erroneously named *C. spinosa* DC. by several earlier authors (FNA 7). Rafinesque's genus *Tarenaya* has been adopted in recent years for American plants that have generally been combined with *Cleome*. In its strict sense, *Cleome* is native only to the Eastern Hemisphere, but some species from both genera have now spread to both sides of the Atlantic (FNA 7).

ALI SA. **HAB** 10 ::: C? 6. **ABU** +4.

0411--*Cleome ornithopodioides* L. W

Cleomaceae [Capparaceae*]: *Cleome ornithopodioides* (iberica)

As in other eastern states, this annual occurs as rare waifs in waste places (Thieret & Thompson 1984), and it does not seem to be increasing much in the wild. For Ky. there are colls. from CAMP (KNK) and probably MARS (?EKY).

ALI EU.

0412--*Polanisia dodecandra* (L.) DC.

Cleomaceae [Capparaceae*]: *Polanisia dodecandra* (graveolens)

This annual is widespread in most of North America, but local, rare or absent in southeastern states. In Ky. and Tenn., most records are from gravelly or sandy riverbanks west of the Appalachians. The only central Appalachian

records are from the Kanawha Rv. in W.Va. and the James Rv. in Va. (PL, W). See notes under *trachysperma*, which is not distinguished here.

HAB f-1,10? ::: C 6. **ABU** g9? s5? -2.

0413--*Polanisia trachysperma* Torr. & Gray T

Cleomaceae [Capparaceae*]: *Polanisia trachysperma* (dodecandra ssp. t.*)

This western taxon has been treated as a large flowered subspecies or variety of *dodecandra* by H.H. Iltis (FNA 7). In Mo. there is much intergradation and little overall difference in range or habitat (Y). But *trachysperma* is reportedly more weedy and perhaps only adventive into northeastern states (W). A coll. from TRIG (APSU) has been referred to this segregate, and other colls. of *Polanisia* need review.

ALI w. **HAB** F-10? ::: C? 6. **ABU** +4.

0414--*Hesperis matronalis* L.

Brassicaceae A <Hesperideae>: *Hesperis matronalis*

This is a popular ornamental biennial that is naturalized in cool temperate regions across North America. In Ky. it has locally escaped from gardens and roadsides into woodlands on fertile soils. It is more widespread than records indicate, especially in the Bluegrass region. It may gradually become an invasive problem across the state. However, the species remains rare to absent south of Va., Ky. and Mo. (K, SE, W).

ALI EU. **HAB** r-10,7,4 ::? D 4? **ABU** +5.

0415--*Iodanthus pinnatifidus* (Michx.) Steud.

Brassicaceae A <Cardamineae>: *Iodanthus pinnatifidus*

This occurs in east-central states, usually in riparian or other submesic woods on seasonally damp fertile soils. It is the only native mustard typical of such habitats in Ky.

HAB 4,7 ::? E 3. **ABU** g9 s9 -3.

0416--*Barbarea vulgaris* Ait. f.

Brassicaceae A <Cardamineae>: *Barbarea vulgaris* (stricta, arcuata)

This biennial is a widespread weed across eastern and central North America. Most material matches var. *arcuata* (Opiz ex J. & K. Presl) Fries, but that taxon is not recognized in most recent treatments. A coll. from FAYE (KY-Agr.) matches the typical variety, in its strict sense.

ALI EU. **HAB** F-10 ::: D 6. **ABU** +6.

0417--*Barbarea verna* (P. Mill.) Aschers.

Brassicaceae A <Cardamineae>: *Barbarea verna*

This biennial from southwestern Europe (reputedly) is widely scattered over temperate North America. But, in Ky. at least, it is much less common than *vulgaris*. Ecological differences are not clear, though *verna* is generally more robust in its dimensions, more lobed in its leaves, and less bitter to taste. It is a traditional "land cress" cultivated for food by early European settlers in North America, then introduced and naturalized in British gardens as "American Cress."

ALI EU. **HAB** F-10 ::: D 6. **ABU** +5.

0418--*Rorippa sessiliflora* (Nutt.) A.S. Hitchc.

Brassicaceae A <Cardamineae>: *Rorippa sessiliflora*

This largely southeastern annual is a close, diploid ($2n = 16$) relative of the more widespread *palustris*. It is less weedy and tends to occur on wetter, muddier sites.

HAB 2,1,9 :: D 6. **ABU** g9 s9 -3.

0419--*Rorippa palustris* (L.) Bess.

Brassicaceae A <Cardamineae>: *Rorippa palustris* ("islandica")

This cosmopolitan tetraploid ($2n = 32$) is a variable biennial or short-lived perennial. Flowers can be larger than described in some sources, with petals up to ca. 4 mm long. Proposed segregates may not be clearly distinct (Al-Shehbaz 1988b; FNA 7). In Ky. colls. have generally been referred to the widespread North American var. *fernaldiana* (Butters & Abbe) Stuckey, but the Eurasian var. *palustris* also appears to be present, and further study is needed (W). Var. *palustris* reportedly differs in its less robust habit but generally longer siliques (4-9 mm versus 2.5-5 mm). Plants from EDMO and SCOT (KY) appear at least transitional to the native northern segregate, var. *hispida* (Desv.) Rydb. Hybrids with *sinuata* and *sylvestris* can also be expected (Y, FNA 7), perhaps suggested by relatively large flowers in some plants.

ALI m. **HAB** 9,6,1 :: D 6? **ABU** g10 s10 -2.

0420--*Rorippa austriaca* (Crantz) Bess. W

Brassicaceae A <Cardamineae>: *Rorippa austriaca*

In North America, this alien rhizomatous diploid ($2n = 16$) occurs mostly in northern regions, and rare southern plants are probably just waifs. It is close to *sylvestris*, and hybrids may be expected (Rollins 1993). The only record from Ky., or perhaps anywhere else in the Ohio Valley (PL), is a verified coll. from

CAMP (KNK): J.W. Thieret #48934, 4 Jun 1976, roadside along highway US 27 directly across from entrance to NKU campus, Highland Heights.

ALI EU. **HAB** R-9? :: D? 6? **ABU** +4.

0421--*Rorippa sinuata* (Nutt.) A.S. Hitchc. R

Brassicaceae A <Cardamineae>: *Rorippa sinuata*

This western species is a rhizomatous, diploid ($2n = 16$) relative of the alien *sylvestris*. *R. sinuata* has distinctive "small, vesicular, hemispherical trichomes that may be collapsed and scale-like in dried specimens" (Cr). It has been recorded from HARD (MM for WKY) and HICK (BT), but colls. have not been relocated and checked. There are verified records from adjacent s. Ill. and se. Mo. (PL, Y).

0422--*Rorippa sylvestris* (L.) Bess.

Brassicaceae A <Cardamineae>: *Rorippa sylvestris*

This widespread weed is one of the few common alien mustards in eastern North America that spreads clonally with true rhizomes; see also *Cardaria draba*. It includes a polyploid series ($2n = 32, 40, 48$) but segregates have not been recognized (Y).

ALI EU. **HAB** F-9,10,1 :: E 6. **ABU** +6.

0423--*Neobeckia lacustris* (Gray) Greene

Brassicaceae A <Cardamineae>: *Neobeckia* [*Rorippa*] (*Armoracia**) *aquatica* (*A. lacustris**)

Although widely scattered across eastern North America, this species is concentrated in the midwest (Ark., Mo., Ill., Ind., Ohio, Mich., N.Y.), and even there it is listed as rare or imperiled by Heritage Programs (NS). Plants in BOON (Nelson 1919) and KENT (PH; see also B) cannot be relocated.

Generic placement of this heterophyllous subaquatic remains unsettled; *Neobeckia* is monotypic (FNA 7, Y, W). Rhizomes are lacking but stems often become decumbent, buried and rooted. Also, the species "is remarkable for its capacity to regenerate plants from tiny fragments of leaves, stems, and roots... [submersed] dissected leaves are usually detached in nature during late summer and fall" (Al-Shehbaz 1988b).

HAB 2 ::? D? 5. **ABU** g6 s4 -3.

0424--*Armoracia rusticana* P.G. Gaertn., B. Mey. & Scherb. C

Brassicaceae A <Cardamineae>: *Armoracia rusticana*

This infamously pungent plant ("horseradish") is widely cultivated. There are records from OLDH and TODD (M), but perhaps just persistent from old gardens. It spreads slowly from root branches, but rarely makes fertile seed. It is self-incompatible and probably originated as a cultivated hybrid of ancestral species in Eurasia (Al-Shehbaz 1988b).

ALI EU.

0425--*Nasturtium officinale* R.Br.

Brassicaceae A <Cardamineae>: *Nasturtium* (Rorippa) *officinale* (R. *nasturtium-aquaticum*)

This is widely naturalized across temperate North America. Short (1837) provided the first clear record from Ky. It is a highly nutritious survivalist food ("watercress") that was introduced by pioneers. JC still collects it for food much more than for the herbarium. It is successful in sunny calcareous springs or associated streams, avoided somewhat by livestock, and now much more widespread in calcareous regions than records suggest. Its perennial decumbent rooting stems should initially be called stolons (Rollins 1993), but they tend to become covered with sediment, then rhizomatous with age (Y). Although often treated in Rorippa, the species is much closer to Cardamine (Y, FNA 7).

ALI EU. **HAB** g-9,1 ~ E 5. **ABU** +6.

0426--*Nasturtium microphyllum* Boenn. ex Reichenbach. R

Brassicaceae A <Cardamineae>: *Nasturtium* (Rorippa) *microphyllum* (*officinale* var. *m.*)

This is a distinct polyploid ($2n = 64$), closely related to typical *officinale*, but sometimes treated as a variety (e.g. F). It has been reported from Ky. by Rollins (1993), but colls. have not been located. It is scattered in cooler regions of eastern states (F, Cr, W; Al-Shehbaz 1988b). Compared to *officinale* ($2n = 32$), *microphylla* has narrower siliques (1-1.5 mm versus 1.8-3 mm), with seeds in one row (versus two); seeds have more polygonal depressions on each side (ca. 75-175 versus 25-60); flowers are slightly larger (petals ca. 6 mm versus 4 mm).

ALI EU.

0427--*Planodes virginica* (L.) Greene

Brassicaceae A <Cardamineae>: *Planodes* (*Arabis*, *Sibara**) *virginica*

This winter-annual is widespread across southeastern states, Mexico and Calif. It has similar ecology to the aliens, *Draba verna* and *Cardamine hirsuta*. See FNA 7 and Y for notes on generic placement. *P. virginica* was generally

confused with *C. hirsuta* in early literature (perhaps = *C. hirsuta* var. *virginica* of Torr. & Gray 1838). In the central Bluegrass, Short (1828-29, see also PH) noted: "*Cardamine virginica*? This little plant excites no other interest than that arising from the early period at which it blooms; being here, as the *Draba verna* in the Eastern states, the earliest harbinger of spring... In cultivated fields abundant; flowering from the middle of February. ...towards the last of February..."

HAB H-10 ::: D 6. **ABU** g10 s10 +2.

0428--*Leavenworthia uniflora* (Michx.) Britt.

Brassicaceae A <Cardamineae>: *Leavenworthia* *uniflora*

This is the most widespread species of the genus, ranging south to Ala., north to s. Ind. and s. Ohio, and disjunct to the west in Ark. and Mo. (Al-Shehbaz 1988b). *L. uniflora* is a winter-annual, largely restricted to rocky calcareous sites, like its congeners. But it is less conservative in its habitats, and appears to benefit from occasional intensive disturbance by ungulates in rocky pastures, perhaps more so than the other species.

HAB g-12,10 == D 6. **ABU** g7 s7 -3.

0429--*Leavenworthia torulosa* Gray

Brassicaceae A <Cardamineae>: *Leavenworthia* *torulosa*

Most records of this winter-annual are from the glades of c. Tenn. In addition there are a few disjunct records from the Pennyrhile region of Ky., and one from n. Ala. (Al-Shehbaz 1988b). The plants in Ky. appear somewhat distinct (D. Estes, pers. comm.).

HAB g-12 == E 6. **ABU** g7 s3 -3.

0430--*Leavenworthia exigua* Rollins var. *laciniata* Rollins

Brassicaceae A <Cardamineae>: *Leavenworthia* *exigua* var. *laciniata*

This globally imperiled winter-annual is collected only from BULL and JEFF; there are also reports from NELS and SPEN (KSNPC). Var. *exigua* occurs in c. Tenn. and nw. Ga., while var. *lutea* Rollins occurs in c. Tenn. and n. Ala. The degree of distinction, and history of disjunction, deserve further investigation. Var. *laciniata* occurs on exposures of Silurian dolomites that were part of a cluster of grasslands, licks and trails used by bison before Virginian settlement. And, based on observations within recent decades, this plant is most prolific in areas that have been grazed, mowed or driven over.

HAB g-12,10 == D 6. **ABU** g3 s3 -3.

0431--*Cardamine hirsuta* L.

Brassicaceae A <Cardamineae>: *Cardamine hirsuta*

Although this diploid ($2n = 16$) winter-annual has become widespread in moist temperate regions of North America, it is curiously rare to absent across north-central regions with more extreme winters and summers (PL). Even within the lower Ohio and central Mississippi Valleys, it becomes less common towards the north and west (e.g. Y).

In Ky. it was not fully documented until the 1930s, when B reported it only from two northeastern counties (CART, ELLI). It may have been present earlier, but was perhaps confused with *Planodes virginica* when using available Floras in the 18th Century (e.g. Gray 1864). There has also been some confusion with *parviflora* and *pensylvanica*; some colls. need to be rechecked.

ALI EU? HAB H-10,7,4 :::: D 6. ABU +6.

0432--*Cardamine parviflora* L. var. *arenicola* (Britt.) O.E. Schulz

Brassicaceae A <Cardamineae>: *Cardamine parviflora* var. *arenicola*
This widespread eastern winter-annual is often confused with *hirsuta*; both are diploids ($2n = 16$) but hybrids are unknown. Typical *parviflora* does not occur in North America, and our plants may deserve species status (W, FNA 7).

HAB h-10,12,9 :::: C? 6. ABU g10 s10 +2?

0433--*Cardamine pensylvanica* Muhl. ex Willd.

Brassicaceae A <Cardamineae>: *Cardamine pensylvanica*
This widespread North American winter-annual is polyploid ($2n = 32, 64$) and relatively variable (Y, FNA 7). Although often confused with other species, hybrids are not documented.

HAB h-9,6,1? :::: D 4? ABU g10 s10 +1?

0434--*Cardamine impatiens* L. T

Brassicaceae A <Cardamineae>: *Cardamine impatiens*
This diploid winter-annual is scattered over northeastern states, especially in riparian zones. In Ky. it has been collected from CAMP (NCU, ?KNK) and JEFF (MM for WKU). See also notes under *flexuosa*, which is easily confused.

ALI EU. HAB h-1,4? :::: D? 4? ABU +4.

0435--*Cardamine flexuosa* With. T

Brassicaceae A <Cardamineae>: *Cardamine flexuosa*

This horticultural weed is considered to be an tetraploid ($2n = 32$) derived from hybrids of *hirsuta* and *impatiens* or perhaps other diploid species; provenance, taxonomy and nomenclature remain uncertain (W, FNA 7). For Ky. there are recorded colls. from CAMP (KNK) and ELLI (B), but these may deserve further study.

ALI EU? HAB H-9,6? ::? D? 4. ABU +4.

0436--*Cardamine rotundifolia* Michx.

Brassicaceae A <Cardamineae>: *Cardamine rotundifolia*
This rhizomatous species is largely restricted to central Appalachian regions, in subaquatic habitats along small streams draining non-calcareous watersheds.

HAB 1,4,6 :::: B 4? ABU g8? s8 -1.

0437--*Cardamine bulbosa* (Schreb. ex Muhl.) B.S.P.

Brassicaceae A <Cardamineae>: *Cardamine bulbosa* (rhomboidea*)
This tuberous perennial is a widespread, variable eastern species ($2n = 8 \times 8, 10 \times 8, 12 \times 8$). There has been uncertainty about whether it should be renamed *C. rhomboidea* (Pers.) DC. (as reviewed by Y and W). See also notes under *douglassii*.

HAB 6,9 D 3. ABU g10 s9 -3.

0438--*Cardamine douglassii* Britt.

Brassicaceae A <Cardamineae>: *Cardamine douglassii* (*bulbosa* var. *purpurea*)
This is a variable tuberous perennial of east-central states ($2n = 8 \times 8, 12 \times 8, 18 \times 8$). In Ky. it usually occurs in submesic or subxeric woods on fertile base-rich soils. There may be rare hybrids with *bulbosa* (e.g. a coll. from ROWA at KY), which usually flowers 2-3 weeks later and usually occurs on much wetter soils. To the north and west of Ky., *douglassii* can occur on relatively damp sites, with more chance of hybridization (Y, FNA 7).

HAB 7,5,11 E 2. ABU g9 s9 -2.

0439--*Dentaria multifida* Muhl. ex Ell.

Brassicaceae A <Cardamineae>: *Dentaria* [*Cardamine*] *multifida* (*heterophylla* var. m.; *C. dissecta*)
This variable polyploid ($2n = 8 \times 8, 14 \times 8$) has a fragmented range, mostly in c. Ala., nw. Ga., Tenn. and sc. Ky. (Al-Shehbaz 1988), but extending east to N.C. and Va. (W). The plants in GRNP are part of disjunct clusters in se. Ind., sc. Ohio and perhaps sw. W.Va. In Ky. there appear to be rare hybrids with

heterophylla (e.g. a coll. of B from WAYN), perhaps laciniata and other species.

HAB 5,7 D 1. **ABU** g8 s8 -2.

0440--*Dentaria heterophylla* Nutt.

Brassicaceae A <Cardamineae>: *Dentaria* [Cardamine] *heterophylla* (C. angustata)

This polyploid ($2n = 16 \times 8$) is most common in Appalachian regions, but it is scattered west in somewhat disjunct populations as far as the Ouachitas of Ark.

It appears to hybridize occasionally with other *Dentarias*.

HAB 5,7 B 1. **ABU** g9 s9 -1.

0441--*Dentaria laciniata* Muhl. ex Willd.

Brassicaceae A <Cardamineae>: *Dentaria* [Cardamine] *laciniata* (C. concatenata)

This variable, high polyploid ($2n = 16 \times 8$ to 32×8) occurs widely in eastern states, but it is rare to absent in much of the southeastern Coastal Plain. It is less restricted to deeper woods, and usually flowers earlier than *diphylla*. In Ky. there appear to be rare hybrids with *heterophylla* (e.g. a coll. from MORG at KY), perhaps *diphylla* and other species.

Dentaria spp. tend to have large, variable chromosome numbers, especially *laciniata* (Al-Shehbaz 1988b). Their genetics are complex, with clonal spread by rhizomes often replacing sexual reproduction. Their degree of distinction from Cardamine, and recognition of their many local races or hybrids, remain controversial subjects.

HAB 7,5 D 2. **ABU** g10 s10 -2.

0442--*Dentaria diphylla* Michx.

Brassicaceae A <Cardamineae>: *Dentaria* [Cardamine] *diphylla*

This polyploid ($2n = 12 \times 8$) has a northeastern range. In Ky. there appears to be rare hybrids of *diphylla* with *heterophylla* and perhaps *laciniata*; see also notes under *maxima*.

HAB 5 D 1. **ABU** g9 s9 -2.

0443--*Dentaria maxima* Nutt.

Brassicaceae A <Cardamineae>: *Dentaria* [Cardamine] *maxima* (?*anomala*, ?*incisa*)

This variable, high polyploid ($2n = 15 \times 8$ to 26×8) has not been clearly defined or recognized across much of its reported northeastern range, especially in southern sections (F, Cr, FNA 7). It is often considered to result from hybridization of *diphylla* and *laciniata* (Al-Shehbaz 1988b). Some colls. mapped here may represent a stable taxon, but others may represent *diphylla* in a depauperate condition, or may be hybrids of *diphylla* and *heterophylla*. Similar uncertainties exist in Tenn., where there are virtually no verified records (Ch; D. Estes, pers. comm.).

HAB 5 C 1. **ABU** g8? s7? -2.

0444--*Chorispora tenella* (Pall.) DC W

Brassicaceae A <Cardamineae>: *Chorispora tenella*

This alien from Central Asia is well-established in arid western regions of North America, but only a waif in eastern states (FNA 7). It was recently discovered in Ky. by P. Haragan (pers. comm.) at Oxmoor Farm in JEFF, growing in a fallow field.

ALI EU.

0445--*Berteroa incana* (L.) DC.

Brassicaceae A <Alysseae>: *Berteroa incana*

This species from eastern Europe has become a troublesome weed in parts of the upper midwest, but it does not appear to be spreading significantly in southeastern states (Al-Shehbaz 1987). For Ky. there is only a coll. from JEFF (Cranfill & Thieret 1981).

ALI EU. **HAB** F-10 ::: D? 5. **ABU** +4.

0446--*Alyssum alyssoides* (L.) L.

Brassicaceae A <Alysseae>: *Alyssum alyssoides*

This European ornamental has escaped to become locally abundant at a few sites in the Bluegrass region, including the Red Bridge Ridge adjacent to Benson Creek (FRAN). At that site, misidentification of non-flowering plants as *Lesquerella globosa* caused severe embarrassment for JC many years ago.

ALI EU. **HAB** F-10,12 ::? E? 4? **ABU** +5.

0447--*Lunaria annua* L.

Brassicaceae A <Alysseae>: *Lunaria annua*

This widely grown ornamental ("honesty") occasionally escapes, but it does not appear to have become widely naturalized in eastern North America (Al-Shehbaz 1987). In Ky. it has been observed spreading away from gardens only in BRAC, CAMP (KNK) and JEFF (P. Haragan, pers. comm.).

ALI EU. **HAB** F--10 ::? E? 6? **ABU** +5.

0448--Alliaria petiolata (Bieb.) Cavara & Grande

Brassicaceae B <Thlaspeidae>: *Alliaria petiolata*

This invasive biennial of woodlands on damp fertile soils is now widespread across northeastern states. The first report from Ky. was by Braun (1943), who listed only KENT. Since 1970 it has increased to become abundant throughout the Bluegrass region, and at many other scattered locations elsewhere. Reliable sight records of SE are added here as open dots.

ALI EU. **HAB** 7,4,5 ::? E 2. **ABU** +5*.

0449--Thlaspi alliaceum L.

Brassicaceae B <Thlaspeidae>: *Thlaspi alliaceum*

This winter/spring-annual is relatively new to North America. It appears to have spread into the Ohio Valley from the east during the 1980s (Thieret & Baird 1985), including the Scioto Valley at first in Ohio (A. Cusick, pers. comm.). Increase occurred rapidly in the Bluegrass region of Ky. during 1990s, especially along mowed roadsides and in adjacent fallow fields. It now occurs in virtually all counties, though it remains infrequent or rare in more hilly regions (R. Thompson, pers. comm.).

ALI EU. **HAB** R-10 ::: E? 6. **ABU** +6.

0450--Thlaspi arvense L.

Brassicaceae B <Thlaspeidae>: *Thlaspi arvense*

This winter/spring-annual is a diploid ($2n = 14$), widespread over temperate North America. In Ky. it was first recorded during 1914 (Gm), but has now become a widespread weed, especially along roads and in cropland on the best soils.

ALI EU. **HAB** H-10 ::: E 6. **ABU** +6.

0451--Microthlaspi perfoliatum (L.) F.K. Mey

Brassicaceae B <Noccaeae>: *Microthlaspi* [*Thlaspi**] *perfoliatum*

This winter/spring-annual is a variable species ($2n = 14-70$) has become increasingly common in east-central states during recent decades. It occurs mostly on agricultural land in a relatively narrow zone from Md. and Va. to s. Mo. and e. Kans. (K). In Ky. it was first recorded in the 1930s (B), and has now become a widespread weed, especially along dry roadsides.

ALI EU. **HAB** R-10,12 ::: D 6. **ABU** +6.

0452--Sisymbrium altissimum L.

Brassicaceae B <Sisymbrieae>: *Sisymbrium altissimum*

This annual weed is widespread over northern states and adjacent Canada, but uncommon to rare in southeastern states. In Ky. most records are from the Bluegrass region during 1930-90, and it may even be declining.

ALI EU. **HAB** F-10 ::: E 6. **ABU** +5.

0453--Sisymbrium loeselii L.

Brassicaceae B <Sisymbrieae>: *Sisymbrium loeselii*

This annual weed is widespread in northwestern regions, especially in association with sheep and wool, but virtually unknown in southeastern states. There is only one certain record from Ky. (Cranfill & Thieret 1981; KNK).

ALI EU. **HAB** R-10 ::: E? 6. **ABU** +4.

0454--Sisymbrium officinale (L.) Scop.

Brassicaceae B <Sisymbrieae>: *Sisymbrium officinale*

This common annual weed is widespread across temperate North America. In Ky. it was recorded early after settlement (McMurtrie 1819). Short (1837) noted: "A troublesome weed, occurring everywhere in neglected and uncultivated grounds." Most Ky. material matches var. *leiocarpum* DC., but that segregate has generally not been recognized in recent treatments. Colls. from MEAD (DHL) and MERC (KY) would match the typical variety.

ALI EU. **HAB** F-10 ::: D 6. **ABU** +6.

0455--Erysimum repandum L.

Brassicaceae B <Erysimeae>: *Erysimum repandum*

This annual weed is a diploid ($2n = 14, 16$), widespread across northern states and adjacent Canada. In Ky. it was first recorded during the 1930s (B). It has become widely scattered but not as abundant as *Sisymbrium officinale*, which is sometimes confused. Some colls. from FAYE, HARR and JEFF have strigose fruits.

ALI EU. **HAB** F-10 ::: D 6. **ABU** +5.

0456--Erysimum hieraciifolium L. W

Brassicaceae B <Erysimeae>: *Erysimum hieraciifolium*

This biennial (or short-lived perennial) is a polyploid ($2n = 32, 40$) scattered across northern states and adjacent Canada. In Ky. it was reported recently by Abbott et al. (2001) from a railroad in LAUR (BEREA).

ALI EU. **HAB** R-10 ::: C? 6. **ABU** +4.

0457--Erysimum cheiranthoides L. W

Brassicaceae B <Erysimeae>: *Erysimum cheiranthoides*
This cosmopolitan annual weed is a diploid ($2n = 16$), widespread in northern and western North America. It is rare or absent in southeastern states, except in or near the Blue Ridge and Piedmont (PL, W). In Ky. it is known only from a coll. originally identified as *E. inconspicuum* (S. Watson) MacMill.: JEFF (DHL), C.R. Gunn #J20, 11 Apr 1954; one colony between River Rd. and railroad, open low grass in parking area no. 2.
ALI W? **HAB** R-9,10 ::: C? 6. **ABU** +4.

0458--*Erysimum capitatum* (Douglas ex Hook.) Greene
Brassicaceae B <Erysimeae>: *Erysimum capitatum* (var. c.; "asperum")
This western biennial or short-lived perennial is occasionally cultivated (as a "wallflower"), escaped or adventive in eastern states. But it appears native in s. Ohio, e. W.Va., w. Va. and especially c. Tenn., where it scattered along bluffs of the Cumberland Rv. and its tributaries (D. Estes, pers. comm.). In Ky. there were no records until the recent discovery in an old field of MADI, where it may have been introduced with "wildflower" sowings (Poindexter & Thompson 2008; G. Dandeneau, pers. comm.). Also, it was discovered during 2010 within an apparently native context by T. Littlefield (KSNPC, pers. comm.): in CUMB along an eroding bluff of the Cumberland Rv. *E. asperum* (Nutt.) DC. is a related species that has been reported from Ky. (E. Carr coll., perhaps at Pine Mt. Settlement School) and some adjacent states, but probably in error (M, Y).
ALI w. **HAB** 12,10 =::? D? 6. **ABU** g10 s2? =?

0459--*Arabis patens* Sullivant R
Brassicaceae B <Arabideae>: *Arabis patens* (Boechea p.)
This is a globally rare biennial concentrated in rocky, base-rich woods of central Appalachian regions, but with disjunct localities west to s. Ind. (Harrison Co.), adjacent to the Knobs region of Ky. (D). Colls. from Ky. are unknown, but there are old reports from FRAN (Wildberger 1880) and BOYL or MERC (Linney 1880, 1882). These reports may have been based on *Boechea shortii*; generic assignment has also been uncertain (FNA 7).

0460--*Arabis pycnocarpa* M. Hokkins var. *pycnocarpa* (M. Hopkins) Rollins
Brassicaceae B <Arabideae>: *Arabis pycnocarpa* var. *pycnocarpa* (*hirsuta* var. p.)
This is widely scattered across western and northern regions of North America. In Ky. there are three reported colls. from rocky woods in the central

Bluegrass, but only one has been fully accessioned (MERC at KY; see also M and Bryant 1973).
HAB 11,7 /:: E? 3. **ABU** g10 s2 -3?

0461--*Arabis pycnocarpa* M. Hopkins var. *adpressipilis* (M. Hopkins) Rollins
Brassicaceae B <Arabideae>: *Arabis pycnocarpa* var. *adpressipilis* (*hirsuta* var. a.)
This occurs mostly in east-central states, from Pa. and Va. to Iowa and Mo. In Ky. the only records are colls. of R. Athey from LIVI (EKY) and WARR (check MEM). Distinction from typical *pycnocarpa* deserves further study, since intermediate plants are known in Ill. and Ind. (FNA 7).
HAB 12 + E? 4. **ABU** g8 s2 -3?

0462--*Arabis caucasica* Willd. C
Brassicaceae B <Arabideae>: *Arabis caucasica*
In North America, this alien is commonly cultivated (as "wall rockcress"), but escapes are verified only in northern regions (FNA 7). There is a coll. recorded from JEFF (DHL), but the label data were minimal (M) and it may have been mislaid.
ALI EU.

0463--*Draba ramosissima* Desv.
Brassicaceae B <Arabideae>: *Draba ramosissima*
This perennial diploid ($2n = 16$) is known only in the Ridge and Valley region, from W.Va. and Md. to Tenn. and N.C., and along the Kentucky River Palisades. Inexplicable unvouched records of Nye (1961) from additional northern counties of Ky. are rejected. Ky. may all be referred to var. *glabrifolia* E.L. Braun, which has leaves and stems glabrous or nearly so (F). Although that variety is not recognized in most recent treatments (e.g. Al-Shehbaz 1987; FNA 7), the potential genetic distinction of this disjunct population deserves attention.
HAB 11 \ E 3. **ABU** g7 s7 =.

0464--*Draba reptans* (Lam.) Fern. R
Brassicaceae B <Arabideae>: *Draba reptans* (*caroliniana*)
This is a variable winter-annual ($2n = 16, 30, 32$) that occurs widely on "dry, sterile or sandy soil" in northern and western states (Cr, FNA 7, W). For Ky., there are only a few old or obscure reports: as *D. hispidula* Michx. by Short &

Peter (1834); as *D. caroliniana* Walt. from WARR by Pr; and as *D. reptans*, without detail by BA. Colls. need to be searched for at MO and elsewhere.

0465--*Draba cuneifolia* Nutt. ex Torr. & Gray

Brassicaceae B <Arabideae>: *Draba cuneifolia* (var. c.)

This tetraploid (2n = 32) occurs mostly in southwestern states; east of the Mississippi it is rare on xeric calcareous sites, and occasionally adventive. A diminutive early bloomer, it is easily overlooked and deserves better documentation; there are few accessed colls. in herbaria of Ky.

HAB 12,10? +:: D? 6. **ABU** g9? s4 -3.

0466--*Draba brachycarpa* Nutt. ex Torr. & Gray

Brassicaceae B <Arabideae>: *Draba brachycarpa*

This relatively robust, but small-fruited, winter-annual (2n = 16, 24) is widely scattered across southeastern states along rocky roadsides and in flatrock glades of various types. See notes under *aprica*.

HAB 12,10 +:: C? 6. **ABU** g10 s8 -2.

0467--*Draba aprica* Beadle

Brassicaceae B <Arabideae>: *Draba aprica* (*brachycarpa* var. *fastigiata*)

Except for the one record in Ky., this globally rare species of siliceous outcrops and gravelly roadsides is known only from the Ozark region (Ark., Mo., Okl.) and the Piedmont or adjacent mountains of Ga. and S.C. (Y, W). *D. aprica* is closely related to *brachycarpa*, but usually flowers a month later (April versus March), and is more restricted to the vicinity of natural outcrops (Y). The coll. by Woods (1983) from a sandstone outcrop near a road in CALL (GH) has been verified, but plants cannot be relocated at the site.

HAB r-12 +:: C? 6. **ABU** g5 s1? -4?

0468--*Draba verna* L.

Brassicaceae B <Arabideae>: *Draba* <*Erophila*> *verna*

The cosmopolitan winter-annual has been common in Ky. for more than a century (Gray 1864; Gm), but was not recorded before the Civil War; see Short's note under *Cardamine hirsuta*. Rather like *C. hirsuta*, *D. verna* is rare or absent in colder and drier regions of North America, but it does spread more into the northern interior (PL). Although many self-pollinating races with different chromosome numbers (2n = 14 to 64) have been described in Europe since Linnaeus, there has been little attempt to distinguish any of these in North America (Al-Shehbaz 1987, FNA 7; but see St).

ALI EU. **HAB** R-10,12 +:: E 6. **ABU** +6.

0469--*Brassica nigra* (L.) W.D.J. Koch

Brassicaceae B <Brassicaceae>: *Brassica nigra*

This annual diploid (2n = 16) is the "black mustard" that is often grown for its seed, but also a common weed across temperate North America. In Ky. it was first recorded early after settlement (M'Murtire 1819).

ALI EU. **HAB** H-10 +:: D 6. **ABU** +5.

0470--*Brassica juncea* (L.) Czern.

Brassicaceae B <Brassicaceae>: *Brassica juncea*

This annual tetraploid (2n = 32) has hybrid origin from *nigra* and *rapa* (Al-Shehbaz 1985). It is often cultivated as "mustard greens" (or as "brown mustard" for its seeds). It is widely naturalized in North America; the paucity of records from Ky. reflects the frequent botanical boredom with brassicaceous weeds.

ALI AS? **HAB** H-10 +:: E? 6. **ABU** +4.

0471--*Brassica rapa* L.

Brassicaceae B <Brassicaceae>: *Brassica rapa* (*campestris*)

This variable annual was originally European and Asian; It includes the common weedy "field mustard", also known as *B. campestris* L., plus several cultivars, including "bird's rape" (*ssp. olifera* DC.) and the common turnip (*ssp. rapa*). These cultivars can revert to wild-types when naturalized; 2n = 20 in all taxa (Al-Shehbaz 1985). There has been some confusion in nomenclature, and there are few verified records from Ky.; see notes under other species.

ALI EU? **HAB** H-10 +:: E? 6. **ABU** +5.

0472--*Brassica napus* L.

Brassicaceae B <Brassicaceae>: *Brassica napus* ("rapa")

This variable annual is widely cultivated in cool temperate regions of North America, and often escapes. It includes var. *napus*, which is the widely cultivated "rape" (also known as "canola oil seed"), and var. *napobrassica* (L.) Peterm., which is the "rutabaga"; 2n = 38 (Al-Shehbaz 1985). *B. napus* was not recorded as a wild plant in Ky. until the 1960s (M). Almost all records are referable to var. *napus*, but var. *napobrassica* has been collected in a wild context from OLDH (DHL). *B. napus* may have hybrid origin from *B. sylvestris* L. (2n = 18), which is also the progenitor of *B. oleracea* L. ("cabbage") and *B. rapa* L., with which there has been some confusion.

ALI EU. **HAB** H-10 +:: D 6. **ABU** +6.

0473--*Sinapis arvensis* L.

Brassicaceae B <Brassicaceae>: *Sinapis* [*Brassica*] *arvensis* (B. kaber)
This annual diploid (2n = 18) of crop fields ("charlock") is widespread across North America, but herbarium records are thin (PL). It is probably undercollected (Y) due to misguided botanical boredom with brassicaceous weeds. The cultivated *S. alba* L. ("white mustard") is also widespread but even less often recorded (PL), and should be expected in Ky. (2n = 24).
ALI EU. **HAB** H-10 ::: D? 6. **ABU** +4.

0474--*Erucastrum gallicum* (Willd.) O.E. Schulz

Brassicaceae B <Brassicaceae>: *Erucastrum gallicum*
This annual is widespread across northern states and adjacent Canada, but uncommon to rare further south.
ALI EU. **HAB** H-10 ::: C? 6. **ABU** +4.

0475--*Diplotaxis tenuifolia* (L.) DC.

Brassicaceae B <Brassicaceae>: *Diplotaxis tenuifolia*
This short-lived perennial is widely scattered over North America, except for more interior regions and southeastern states (PL, W). In Ky. it is known only from the southern Bluegrass and its transitions to the Knobs, with a few 1900-1950 colls. (KY-Agr.; Wharton & Barbour 1991) plus a recent coll. of JC from the grassland remnants of MADI along Rt. 1986. The closely related annual or short-lived perennial, *D. muralis* (L.) DC., may also be expected, and can be hard to distinguish (FNA 7).
ALI EU. **HAB** H-10 ::: D? 6. **ABU** +4.

0476--*Raphanus sativus* L. C

Brassicaceae B <Brassicaceae>: *Raphanus sativus*
This widely grown annual ("radish") does occasionally escape, but it is probably not truly naturalized. There are colls. from FRAN (EKY) and WARR (WKY). *R. sativus* can be hard to distinguish from *raphanistrum*, and hybrids are possible (Y).
ALI EU.

0477--*Raphanus raphanistrum* L. R

Brassicaceae B <Brassicaceae>: *Raphanus raphanistrum*
Although widely scattered in North America, this annual does not appear to be well established in Ky. The only records may be colls. of M.E. Wharton ca. 1940 from BATH (MICH) and MADI (KY); but see also *sativus*. Gm noted:

"occasional plants observed among young alfalfa, where probably introduced with the alfalfa seeds..."

ALI EU.

0478--*Conringia orientalis* (L.) Dumort.

Brassicaceae B <Brassicaceae>: *Conringia orientalis*
This annual is widely scattered across northern states, but rare to absent in the southeast (PL, W). In Ky. the only records are colls. dated ca. 1900-1910 from the Bluegrass (KY-Agr.), plus a more obscure record from LOGA (M).
ALI EU. **HAB** H-10 ::: E? 6. **ABU** +4.

0479--*Coincya monensis* (L.) Greuter & Burdet ssp. *recurvata* (All.)

Leadley
Brassicaceae B <Brassicaceae>: *Coincya* [*Hutera*] *monensis* ssp. *recurvata* (H. cheiranthos)
Naczi & Thieret (1996) have documented the slow spread of this alien across eastern North America, and reported its first coll. from Ky. It has often been overlooked, and it has a confused nomenclatural history.
ALI EU. **HAB** R-10 ::: C? 6. **ABU** +4.

0480--*Descurainia pinnata* (Walt.) Britt. var. *brachycarpa* (Richards.) Fern.

Brassicaceae C <Descurainieae>: *Descurainia pinnata* var. *brachycarpa*
This is a variable annual of eastern and central North America (2n = 14, 28, 42). The largely northeastern and midwestern taxon, as well as the southeastern var. *pinnata*, are typical of dry disturbed places. They appear widely scattered along cliffs, trails, roads or railroads with dry base-rich soils. In Ky. their status remains uncertain: both may be native or considered waifs from afar. The more western var. *intermedia* (Rydb.) Hitchc. may also be expected as a waif (FNA 7, W).
HAB r-12,10,11 +:: D 4? **ABU** g10 s8 -2?

0481--*Descurainia pinnata* (Walt.) Britt. var. *pinnata*

Brassicaceae C <Descurainieae>: *Descurainia pinnata* var. *p.*
See notes under var. *brachycarpa*. In Ky. var. *pinnata* is known only from a recent coll. under limestone cliffs in MERC (M; WKY), plus an old coll. by R. Peter (NY, May 1834) from the "Kentucky River", assumed to be in FAYE.
ALI s. **HAB** r-12,10? +:: D? 6? **ABU** g9 s1? -2?

0482--*Descurainia sophia* (L.) Webb ex Prantl

Brassicaceae C <Descurainieae>: *Descurainia sophia*

This annual tetraploid (2n = 28) is widely scattered over temperate North America, but it is infrequent to rare in southeastern states.

ALI EU. **HAB** H-10? ::: E 6. **ABU** +4.

0483--*Boechera burkii* (Porter) Windham & Al-Shehbaz ?

Brassicaceae C <Boechereae>: *Boechera* (*Arabis**) cf. *burkii* (*laevigata* var. b.)

Mapping here is somewhat tentative. This largely central Appalachian biennial has recently been redefined as a distinct species by Windham & Al-Shehbaz (2007; FNA 7, W), but the status of its disjunct records in c. Ky. remains somewhat uncertain. There has also been some confusion between *burkii* and plants of the shale barrens in Va. and W.Va. that are now known as *B. serotina* (Steele) Windham & Al-Shehbaz.

Plants mapped here do fit the traditional description of *laevigata* var. *burkii*, with cauline leaves not at all auriculate or sagittate-clasping at the base, linear and entire (F). *B. burkii* reportedly also differs from typical *laevigata* in its more numerous cauline leaves (ca. 18-28 versus 7-15), and its narrower petals (ca. 0.5-0.7 mm versus 1-1.5 mm). Further confirmation of these characters is needed in Ky.

HAB 12,11,10? + D? 2. **ABU** g8? s6? -1.

0484--*Boechera laevigata* (Muhl. ex Willd.) Al-Shehbaz

Brassicaceae C <Boechereae>: *Boechera* (*Arabis**) *laevigata* (var. l.)

This biennial is widespread across eastern and central North America, mostly in rocky woods with base-rich soils. In Ky. it is most common on limestone, but smaller populations occur on less calcareous sites. Some plants referred to "burkii" (see below) may just represent depauperate plants on less fertile soils.

HAB 11,5,12 + E? 2. **ABU** g10 s10 -2.

0485--*Boechera missouriensis* (Greene) Al-Shehbaz

Brassicaceae C <Boechereae>: *Boechera* (*Arabis**) *missouriensis* (*laevigata* var. m.)

This biennial is widely scattered over eastern states, mostly in rocky woods, but generally rare except in the Ozark region (NS). In Ky. the only records are from gravel ridges on Backusburg Hill in CALL (EKY, MUR, NCU).

HAB 12,11 +? D 3. **ABU** g8 s2 -4?

0486--*Boechera perstellata* (E.L. Braun) Al-Shehbaz

Brassicaceae C <Boechereae>: *Boechera* (*Arabis**) *perstellata* (var. p.)

This perennial is known only from wooded calcareous slopes at a few localities in c. Ky. and c. Tenn. The plants in Tenn. have been considered distinct, as var. *ampla* Rollins, by some authors. B collected an apparent hybrid with *laevigata* in FRAN (GH). Although most closely related to *dentata*, no transitions or hybrids have been documented.

HAB 5,11 +\ E 2. **ABU** g3 s3 -2.

0487--*Boechera dentata* (Raf.) Al-Shehbaz & Zarucchi

Brassicaceae C <Boechereae>: *Boechera* (*Arabis**) *dentata* (*shortii*; *perstellata* var. s.)

This biennial (or perhaps short-lived perennial) is widely scattered across east-central states, but generally uncommon to rare in Appalachian regions and the Ohio Valley (Al-Shehbaz 1988b; NS). Under the name *Sisymbrium dentatum* Torr., Short (1837) noted: "occurs abundantly on sandy banks of the Ohio river, flowering very early in the spring." The nomenclatural priority of *dentata* Raf. over *shortii* Fern. has been recently clarified (Al-Shehbaz & Zarucchi 2008).

HAB 5,4 E 1? **ABU** g8 s7 -2.

0488--*Boechera canadensis* (L.) Al-Shehbaz

Brassicaceae C <Boechereae>: *Boechera* (*Arabis**) *canadensis*

This widespread eastern biennial generally occurs in rocky woods on acid, non-calcareous soils.

HAB 7,11,5 C 2. **ABU** g10 s9 -2.

0489--*Turritis glabra* L.

Brassicaceae C <Camelineae>: *Turritis* (*Arabis**) *glabra* (*A. perfoliata*)

This monotypic circumboreal genus has a widespread northern and western range in North America, and may only be adventive in some southeastern states (W). It is a diploid (2n = 12) that is reportedly an annual, biennial or short-lived perennial (Cr, FNA 7, W). In Ky. it is known only from OLDH (DHL) and SHEL (KY-Agr.). There is also a general report from c. Ky. by Linney (1882), under the synonym *Arabis perfoliata* Lam.

ALI n. **HAB** h-12,10,8 ::? D? 4. **ABU** g10 s1? -2?

0490--*Arabidopsis lyrata* (L.) O'Kane & Al-Shehbaz

Brassicaceae C <Camelineae>: *Arabidopsis* (*Arabis**, *Sisymbrium*) *lyrata*

This diploid ($2n = 12$) biennial (or short-lived perennial) has a wide northern range, with varied habitats, and includes subspecies in Europe and Asia. In Ky. it has been collected from PIKE (NCU): F. Levy, 19 May 1982, "dry thin soil on rock outcrop outside Pool Pt R.R. bridge near Breaks." There are also records based on unverified colls. from CALL (Woods & Fuller 1989), ESTI (Anderson 1947; check Iowa State Univ.), "knobs" of GRNP (coll. by Riddell fide Short 1840; Hopkins 1937), and "edge of woods near Louisville" in JEFF (Hopkins 1937). Transfer from *Arabis* to *Arabidopsis* is supported by recent research (O'Kane & Al-Shehbaz 2003; FNA 7).

HAB 11 +\ D 3. **ABU** g10 s3 -1.

0491--*Arabidopsis thaliana* (L.) Heynh.

Brassicaceae C <Camelineae>: *Arabidopsis* (*Sisymbrium*) *thaliana*
This weedy winter/spring-annual of fallow fields is found across temperate North America, especially on relatively infertile, worn-out fields or sandy soils. In Ky. it has been locally abundant since early after settlement (Short et al. 1833; Gm). And in greenhouses of the Univ. of Ky., there is now intensive genetic research on its unusually few chromosomes ($2n = 10$).

ALI EU. **HAB** H-10 ::: C? 6. **ABU** +6.

0492--*Camelina microcarpa* DC.

Brassicaceae C <Camelineae>: *Camelina microcarpa* (*sativa* ssp. m.)
This winter/spring-annual is widely scattered over temperate North America. In Ky. it was first reported by McFarland (1941). Uncertain records mapped here may become transferred to *sativa*; see notes under that name.

ALI EU. **HAB** F-10 ::: E? 6. **ABU** +4.

0493--*Camelina sativa* (L.) Crantz R

Brassicaceae C <Camelineae>: *Camelina sativa* (ssp. s.)
This annual weed from eastern Europe is much less common in southeastern states than the closely related species, *microcarpa*, which is often confused (Al-Shehbaz 1987); both are polyploids ($2n = 40$). There are recorded colls. from KENT (PH; see B), JEFF and SIMP (colls. of MM in processing at WKY), but these all need to be rechecked.

ALI EU. **HAB** F-10 ::: E? 6. **ABU** +4.

0494--*Capsella bursa-pastoris* (L.) Medik.

Brassicaceae C <Camelineae>: *Capsella* (*Thlaspi*) *bursa-pastoris*
This weedy winter-annual is widespread over temperate North America. In Ky. it appears to have been common during the earliest period of settlement,

when listed in the genus *Thlaspi* (McMurtrie 1819; Short 1928-9). Short noted: "Found everywhere in cultivated ground." Gm noted: "well-known from its constant presence about human habitations... not much disposed to spread greatly elsewhere..."

ALI EU. **HAB** G-10 ::: D 6. **ABU** +6.

0495--*Paysonia lescurii* (Gray) O'Kane & Al-Shehbaz

Brassicaceae C <Physarieae>: *Paysonia* [*Lesquerella**] *lescurii*
This globally rare species is known mostly from plowed, eroded, rocky or otherwise bared soils on river-bottoms and calcareous glades in c. Tenn. Records from Ky. and Ala. have been considered adventive (Al-Shehbaz 1987), but in Ky., at least, the locality is merely a downstream extensive of large populations along the Cumberland Rv. in Tenn. See O'Kane & Al-Shehbaz (2002) for support of generic realignments.

HAB f-10,9,6? ::: D? 4. **ABU** g6 s2 -5.

0496--*Physaria globosa* (Desv.) O'Kane & Al-Shehbaz

Brassicaceae C <Physarieae>: *Physaria* [*Lesquerella**] *globosa*
This unusual globally endangered biennial (or occasionally winter-annual) is known mostly from c. Ky. and c. Tenn. There is also a disjunct population along a roadside within the flatwoods of sw. Ind. Old records from Ark., Mo., and Ohio remain unverified (Gray 1889, F, Al-Shehbaz 1987). See O'Kane & Al-Shehbaz (2002; and other citations in W) for support of generic realignments.

In Ky., under the name *Vesicaria shortii* Torr. ined., Short (1837) noted: "This very rare plant, of which we have only met with two imperfect specimens, on Elkhorn Creek between Lexington and Frankfort, is considered by Dr. Torrey a new species." But in 1914, Gm noted: "growing abundantly on waste land along railroads, etc."

P. globosa is now largely restricted to a few sites in rocky woods of the central Bluegrass region, where thin or eroded soil supports small populations. Only a few waifs in landscapes with deeper soils have been found in recent decades. In urban yards, the species can be locally established on rocky patios (C. Chandler, pers. comm.) along driveways (D. Svetitch, pers. comm) or similar sites, but seedlings sometimes suffer high mortality due to slugs or other herbivores. It seems likely that animal trails or other disturbance promoted this species before settlement, but that reduction in wilder lands plus

the invasion of European Brassicaceae and associated pests has now led to its precarious position.

HAB r-10,11,7 +:: E 4. **ABU** g3? s2 -5.

0497--Lepidium ruderales L.

Brassicaceae C <Lepidieae>: *Lepidium ruderales*

This cosmopolitan diploid ($2n = 16$) has been recently found by JC along a busy highway in Lexington (FAYE). Previous reports remain dubious or unverified (M, NS). It is widely scattered in Mo. (Y), Ohio (A. Cusick, pers. comm.) and probably other states adjacent to Ky.

L. ruderales is similar to *densiflorum*, but differs in its elliptic to ovate fruits (versus obovate to orbicular), which are usually smaller (ca. 1.5-2.5 x 1.5-2 mm versus 2.5-3.5 x 2-2.5 mm); fruiting pedicels are thinner (ca. 0.1-0.15 mm thick versus 0.15-0.25 mm) and puberulent throughout (versus just at summit). Its flowers lack petals completely (versus up to 0.3-0.9 mm long). Plants are typically shorter when well-grown (ca. 1-3.5 dm versus 2.5-5 dm), and even able to flower as dwarfed plants (ca. 0.5-1 dm) when growing densely in stressed environments.

A similar Eurasian species with glabrous, glaucous leaves, much larger flowers and fruits is *L. sativum* L. ("garden cress"), which may be expected as an escape from cultivation (Cr, FNA 7, W).

ALI EU. **HAB** R-12,10 ::: D? 6. **ABU** +4.

0498--Lepidium densiflorum Schrad.

Brassicaceae C <Lepidieae>: *Lepidium densiflorum*

This western tetraploid annual has spread into eastern states to become about as common as *virginicum* in Ohio (A. Cusick, pers. comm.) and elsewhere. It is easily confused with *virginicum*, but hybrids are not documented (Y, FNA 7). Colls. of both species need rechecking. *L. densiflorum* differs in its petals lacking or rudimentary (versus at least as long as sepals); fruits obovate to suborbicular (versus orbicular); and its relatively condensed inflorescence with straight, slender to subclavate hairs (versus curved, cylindrical).

ALI W. **HAB** R-10,12 ::: D 6. **ABU** +4.

0499--Lepidium virginicum L.

Brassicaceae C <Lepidieae>: *Lepidium virginicum* (var. v.)

This variable, tetraploid annual is widespread across temperate North America. In Ky., as var. *virginicum*, it is perhaps the most widespread native

species of Brassicaceae on open uplands; but see also *Cardamine parviflora* and *Sibara virginica*. Gm noted: "Tho a very common and familiar weed everywhere, this plant has not acquired a bad reputation in Kentucky... Caged birds like the seeds and probably poultry feed on the capsules at times."

HAB R-10 ::: D 6. **ABU** g10 s10 +3.

0500--Lepidium didymum L. W

Brassicaceae C <Lepidieae>: *Lepidium* (*Coronopus**) *didymum*

This South American tetraploid ($2n = 32$) is scattered throughout the southeastern Coastal Plain, but it does not seem to be well-established in the Ohio Valley. There is a recent report from Ky., but details are not available (J). The species has been treated in *Coronopus*, but that genus now appears to be unnatural and *didymum* is relatively close to *virginicum* (Y, FNA 7, W). **ALI** SA.

0501--Lepidium campestre (L.) Ait. f.

Brassicaceae C <Lepidieae>: *Lepidium campestre*

This diploid ($2n = 16$) winter-annual is a widespread weed in temperate North America. In Ky. it was not recorded until the 1930s (B), but is now the most abundant species of *Lepidium* in Ky., at least in crop fields.

ALI EU. **HAB** H-10 ::: D 6. **ABU** +6.

0502--Lepidium perfoliatum L. W

Brassicaceae C <Lepidieae>: *Lepidium perfoliatum*

This diploid winter-annual is widely scattered across northern and western regions of North America. It appears generally rare to absent in southeastern states (PL), but may have been overlooked. The only Ky. record is a coll. of J.T. Thieret from CAMP (KNK). See FNA 8 and Y for details of differences from *campestre*.

ALI EU. **HAB** R-10 ::: D? 6. **ABU** +4.

0503--Cardaria draba (L.) Desv.

Brassicaceae C <Lepidieae>: *Cardaria* [*Lepidium*] *draba*

This is one of the few alien species of Brassicaceae in Ky. that has true rhizomes; see also *Rorippa sylvestris*. Although a serious weed in western North America, it is rare or absent in southeastern states (PL, W). *Lepidium draba* L. may become the preferred name again (Y).

The closely related *L. chalapense* L. (= *C. draba* ssp. *chalepensis*) and *L. appellianum* Al-Shehbaz (= *C. pubescens*) may also be expected (Y). These

three "hoary-creeses" are noxious weeds that include a complex polyploid series: 2n = 16 (appellianum); 32, 64 (draba); 48-128 (chalepensis).

ALI EU. **HAB** F-10 :: C? 6. **ABU** +4.

0504--Celastrus scandens L.

Celastraceae: *Celastrus scandens*

Although widespread across eastern North America, this vine is uncommon to rare in warmer or drier regions, including much of w. Ky. and c. Tenn. except close to the Mississippi Rv. In 1914, Gm noted: "found everywhere in thickets and in openings, clambering over fences, rocks and shrubs, and in the absence of support, sometimes sprawling on the ground." It remains widely scattered across north-central Ky. in richer soils, but it has become rare in more populated areas.

C. scandens may have been reduced due to harvesting of fruiting branches for decoration, and perhaps local intense browsing by deer and livestock. Gradual invasion of *orbiculatus* could pose another threat by direct competition, more tolerance of browsing, and genetic introgression; 2n = 46 in both species (Pooler et al. 2002; Y).

HAB 8,7,11 D 4. **ABU** g10 s9 -3.

0505--Celastrus orbiculatus Thunb.

Celastraceae: *Celastrus orbiculatus*

This high-climbing vine is now a major problem in several eastern states, initially in mid-Atlantic urban areas but now also Appalachian regions and the Ohio Valley. Although present in North America for over 50 years, major invasions only occurred after 1970, probably assisted by promotion for horticulture. Unfortunately, the fruit of *orbiculatus* has been touted for ornamental uses, with insufficient attention for the alternative cultivation and selection of *scandens*. In Ky. this species has the potential to become widespread along woodland edges due to dispersal by birds from plantings. It has become locally abundant at several scattered localities, but especially in northeastern regions where it seems to have spread from extensive populations across se. Ohio and W.Va. (D. Taylor, pers. comm.).

ALI AS. **HAB** 8,7 D 4. **ABU** +5*.

0506--Euonymus europaeus L. C

Celastraceae: *Euonymus europaeus*

This shrub of calcareous soils has become locally established in several northeastern states (PL). In Ky. it does not seem to be increasing significantly

on the landscape. The few records date from ca. 1930-1970 (B, M), and colls. still need to be verified. It is not clear if all of these were from truly wild plants, but B noted "locally established as an escape."

ALI EU. **HAB** 8,7,4? E 3. **ABU** +4.

0507--Euonymus atropurpureus Jacq.

Celastraceae: *Euonymus atropurpureus*

This shrub is widespread in eastern and central North America, but generally rare to absent on infertile acid soils. It is often browsed back by rabbits, deer or other mammals. Short (1828-9) noted: "found in rich moist forests, not too much frequented by cattle." Also, the alien *euonymus* scale-insect often infests plants, especially in more sunny locations.

HAB 8,7,4,5 E 2. **ABU** g9 s9 -3.

0508--Euonymus americanus L.

Celastraceae: *Euonymus americanus* (var. a.)

This shrub is widespread in southeastern states, but usually restricted to medium acid soils and rare or absent in some calcareous regions. Like other *Euonymus* spp. it is much browsed by deer and other herbivores. But *americanus* has evolved an unusual ability to escape and spread vegetatively with extensive stoloniferous branches. In forest gaps and thickets, these branches can rapidly grow up to form shrubs 2 m tall or more. The closely related *obovatus* on base-rich soils remains more hidden on the ground.

HAB 7,5,8 C 2. **ABU** g9 s9 -2.

0509--Euonymus obovatus Nutt.

Celastraceae: *Euonymus obovatus* (*americanus* var. *prostratus*)

This is scattered across east-central states, but most frequent in s. Mo., Ill., Ind., Ohio, s. Mich. and w. Penn. (PL). In Ky. there is a pronounced cluster of records along the Kentucky River Palisades, but it is found occasionally on steep base-rich wooded slopes near other rivers across the state. *E. obovatus* is a curious prostrate, spreading or trailing subshrub that ascends to only about 1 (rarely 3) dm above the ground, including flowers and fruits (F, Cr, Y). Yet it appears closely related to *americanus*, with little consistent clearcut difference other than its low habit and leaf shape (usually obovate versus elliptic).

HAB 5,11 + E 2. **ABU** g8 s8 -1.

0510--Euonymus alatus (Thunb.) Sieb.

Celastraceae: *Euonymus alatus*

This invasive shrub is abundantly planted (as "winged burning bush") across east-central states, especially in suburban landscapes. It presents a serious long-term problem, and its sale should be banned. In Ky it has become naturalized much more widely than colls. indicate; sight records of SE are mapped here as open dots. Some plants that lack pronounced wings may be referable to var. aptera Regel, which has been treated as a species (K), but their taxonomic status is not unclear.

ALI AS. HAB 8,7,4 E 3. ABU +6*.

0511--Euonymus kiautschovicus Loes.

Celastraceae: *Euonymus kiautschovicus*

This Chinese shrub has been planted widely in southeastern states during recent decades, and it may be a locally frequent escape, especially in warmer coastal regions (W, PL). In Ky. is probably much more frequent than records suggest. It has been combined with fortunei in some treatments (e.g. J.S. Ma in Y), but its shrubby non-climbing habit is quite distinct and petioles are usually shorter (4-7 mm versus 11-17 mm).

E. japonicus Thunb. is a closely related Japanese species that has been planted further south (W); it has denser inflorescences, more evergreen leaves, longer petioles (on average, intermediate), and taller habit (to 6 m versus 3 m).

ALI AS. HAB 8,7 D? 3. ABU +5*.

0512--Euonymus fortunei (Turcz.) Hand.-Maz.

Celastraceae: *Euonymus fortunei* (hederaceus)

This is an ecologically noxious--yet commercially addictive--woody vine from China and Japan. It has been widely planted and now naturalized in east-central states. Plants in North America may be referable to var. radicans (Siebold ex Miq.) Rehder. The obscure name *E. hederaceus* Champ. ex Benth. had priority over fortunei (Y), but there has been a proposal to conserve fortunei (Cao & Ma 2006). See also notes under *kiautschovicus*. J.S. Ma (in Y) and W have provided recent notes on nomenclature and spelling in Celastraceae.

In Ky. fortunei is much more widespread than the mapped colls. The sight records of SE are mapped here as open dots. With ignorant promotion and virtually no restriction, this species has spread rapidly through the Ohio Valley since the 1970s, especially in the Bluegrass region, where it has become one of the most serious alien threats to native woodlands and

residential landscapes. It appears to do best on calcareous soils, remaining much less common in Appalachian regions of Ky. and further east (W).

ALI AS. HAB 7,8,5,11 D 2. ABU +6*.

0513--Paxistima canbyi Gray

Celastraceae: *Paxistima canbyi*

This globally imperiled species of limestone clifftops has an unusual fragmented distribution pattern, occurring in the Ridge-and-Valley region from Pa. to N.C., plus the disjunct western margins of the Appalachian Plateaus in Ohio and Ky. Similar patterns occur in *Phlox subulata* var. *australis* and *Solidago harrisii* (Campbell et al. 1993). Such distributions are probably relictual from a previous climatic era when conditions were more suitable for dispersal and growth (Braun 1955).

The isolated populations of *Paxistima* generally seemed stable until recent years, but the alien euonymus scale insect has now been observed infesting several patches. Declines are probably under way (T. Littlefield, pers. comm.), and the only hope for survival in some cases may be horticultural. The wild patches may be largely clonal, and fruiting has never been observed in Ky., but cross-pollination may be successful when clones are artificially grown together (W. Stoutamire, pers. comm.).

HAB 12 +\ D 3. ABU g5 s4 =.

0514--Parnassia asarifolia Vent.

Parnassiaceae [Celastraceae] (Saxifragaceae*): *Parnassia asarifolia*

This southeastern species occurs mostly in Appalachian and Ozarkian regions, and is restricted to boggy acid soils.

HAB 6,4 A 2. ABU g8 s3 -1.

0515--Parnassia grandifolia DC.

Parnassiaceae [Celastraceae] (Saxifragaceae*): *Parnassia grandifolia*

This southeastern species occurs mostly in calcareous seeps from Appalachian to Ozarkian regions.

HAB 6 ~| D 3. ABU g6? s2 -2.

0516--Oxalis rubra St.-Hil. R

Oxalidaceae: *Oxalis* <|*Ionoxalis*> *rubra* (*articulata* ssp. r.)

This ornamental with pink-purple flowers was listed for Ky. by BA but no collection has been located. It does rarely persist or escape from cultivation in southeastern states (W).

ALI SA.

0517--*Oxalis violacea* L.

Oxalidaceae: *Oxalis* <*Ionoxalis*> *violacea*

This bulbous perennial is widespread in eastern and central states. usually on rather dry, medium acid soils. In Ky. and elsewhere in southeastern states, it is largely restricted to woodlands, but further west it often grows in grasslands. However, segregates have generally not been recognized; 2n = 28.

HAB 7,11,5 C 2. **ABU** g10 s10 -2.

0518--*Oxalis montana* Raf.

Oxalidaceae: *Oxalis* <*Oxalis*> *montana* (*acetosella** ssp. m.)

This rhizomatous taxon is restricted to mesic woods in cool temperate, subalpine or boreal zones of northeastern North America. In Ky. it occurs only on strongly acid soils in ravines of the Appalachian Cliff Section, and in the Cumberland Mts. *O. montana* is close to the Eurasian *O. acetosella* L. and sometimes combined; 2n = 22 in both taxa (Cr).

HAB 5 A 1. **ABU** g10 s6 =.

0519--*Oxalis grandis* Small

Oxalidaceae: *Oxalis* <*Corniculatae*> *grandis*

Although this species occurs widely in Appalachian regions and nearby hills, it was not generally recognized until Small's description in 1894. Rafinesque's (1836, 2:26-27) "*rupestris*" may have been *grandis*, collected "On the cliffs of the River Kentucky"; but see Nesom (2009) and notes under *illinoensis*. In Ky. some western records of *grandis* need to be rechecked for possible transitions to *illinoensis*, which is mixed with *grandis* in s. Ind. (Heikens 2003) and c. Ky. (e.g. the colls. from BREC at KY).

HAB 5,7 :: D 2. **ABU** g9 s9 -2.

0520--*Oxalis illinoensis* Schwegm.

Oxalidaceae: *Oxalis* <*Corniculatae*> *illinoensis*

This is known only from s. Ill., s. Ind., w. Ky. and w. Tenn. (Schwegman 1982; Heikens 2003; Nesom 2009; D. Estes, pers. comm.). In Ky. few colls. have been identified, but *Oxalis* in general needs more revision. There may be some intergradation with *grandis*. There has also been some initial confusion with *priceae*, but that species now appears clearly distinct.

O. illinoensis reportedly differs from *grandis* in its single, terminal, fleshy fusiform tubers connected by relatively slender herbaceous rhizomes (versus

more continuous lignescent rhizomes); however, tubers sometimes cannot be found in the woods. Its leaflets are usually rather pale yellowish-green and lack purplish margins (versus usually deeper green and purple-margined), more or less straight-edged above the base (versus clearly concave), and with relatively shallow, less acute terminal notches. Its peduncles are mostly shorter, with flowers usually among the leaves (versus clearly extending above). Flowers are often larger (petals ca. 12-18 mm long versus 10-14 mm), and more strongly red-lined within.

HAB 5,7,11 E? 2. **ABU** g5? s4? -3?

0521--*Oxalis priceae* Small

Oxalidaceae: *Oxalis* <*Corniculatae*> *priceae* (*colorea*, ?*macrantha**; *recurva* var. m.)

This is typical of rocky calcareous woods and glade margins on the southern Interior Low Plateaus (especially c. Tenn. and n. Ala.), and on the Gulf Coastal Plain. There has been uncertainty over the correct name for these plants, and much confusion with *florida* (W; Nesom 2009). Rafinesque's (1836, 2:27) "*cespitosa*" evidently applied to this species: he found it in "Glades of West Kentucky and West Tennessee, abundant, vernal, found in May and June 1823." This note predated Small's description of *priceae* in 1898, but "*caespitosa*" had already been used for a different species of *Oxalis* (Nesom 2009).

Flowers and leaves of typical *priceae* are distinctly larger than *florida*. Like *grandis* and *illinoensis*, *priceae* has relatively large flowers, more or less red-lined in the throat. Flowers of *priceae* are particularly large (the petals 14-20 mm long) with strong red-lines, produced in umbelliform cymes well above the leaves. Also, stems are covered with dense non-septate hairs, and plants tend to produce several woody rhizomes.

HAB 11,12 + D 3. **ABU** g7? s7? -2.

0522--*Oxalis florida* Salisbury T

Oxalidaceae: *Oxalis* <*Corniculatae*> *florida* (*filipes*, *recurva*, *prostrata*; ?*macrantha*)

According to recent revision, this is a widely scattered southeastern species that has often been confused with other taxa (Nesom 2009; W). It appears closest to *stricta* but less robust (mostly 8-30 cm tall versus 20-60 cm), with fewer flowers per cyme (usually 1-3 versus 5-7). Also, it is sparsely covered with non-septate hairs or glabrous (versus hairy or glabrous, often with some septate hairs), and develops taproots (versus rhizomes). In Ky. there are

reports from CARL, LYON and ROWA (B), mostly under the name *O. filipes*. Small or related combinations (M). A thorough review of colls. is needed.

HAB h-7,8,10,11? C? 3? **ABU** g8? s4? -2?

0523--*Oxalis stricta* L.

Oxalidaceae: *Oxalis* <Corniculatae> *stricta* (europaea, bushii, ?fontana)

This is a widespread, cosmopolitan species. Its native origins and historical spread remain somewhat obscure (Cr; G. Nesom, pers. comm.), perhaps bound up with early human history. There has been confusion with the closely related *dillenii* and *florida*; 2n = 18-24 in this whole group.

O. stricta usually has larger cymes than *dillenii* (with ca. 5-7 flowers versus 1-3), and some relatively long spreading septate hairs, at least on petioles or concentrated near nodes (as well as spreading non-septate hairs). In contrast, *dillenii* has stems (at least above) with dense antrorse appressed non-septate hairs (Nesom 2009; W). Also, *stricta* lacks stipules (versus usually present), and has short slender rhizomes (versus none). It is often relatively tall and weedy in sunny habitats; *dillenii* is also weedy but tends to be more shade-tolerant.

ALI ? **HAB** H-10,7 ::: D 6. **ABU** +6.

0524--*Oxalis dillenii* Jacq.

Oxalidaceae: *Oxalis* <Corniculatae> *dillenii* ("stricta"; "filipes")

This is widespread in varied disturbed habitats of eastern and central North America. It has been frequently confused with *stricta*, which tends to occur in more open habitats; see notes under that species.

HAB h-7,8,10,11 ::: D 4. **ABU** g10 s10 +1?

0525--*Oxalis corniculata* L.

Oxalidaceae: *Oxalis* <Corniculatae> *corniculata* (repens)

This rapidly creeping, stoloniferous is an adaptive, variable weed (2n = 24, 42, 48). It may originate from warmer regions in the Americas (Nesom 2009; W), but was recorded in Ky. early after settlement (Short et al. 1833). In 1914 Gm noted: "A common weed of no great consequence..." Although widespread in the state, it is largely restricted to horticultural or residential settings, and there are rather few colls. It appears to be most frequent common on medium-acid, sandy or gravelly soils.

ALI S? **HAB** H-10 ::: C 6. **ABU** +4.

0526--*Hypericum stragulum* P. Adams & Robson

Hypericaceae [Clusiaceae*]: *Hypericum* <Ascyrum> *stragulum* (*hypericoides* ssp. *multicaule*)

This subshrub occurs across east-central states from mid-Atlantic to Ozarkian regions, usually in woods on acid soils. See notes under *hypericoides*.

HAB 11,7 B 2. **ABU** g10 s10 -2.

0527--*Hypericum hypericoides* (L.) Crantz

Hypericaceae [Clusiaceae*]: *Hypericum* <Ascyrum> *hypericoides* (ssp. *h.*; *oblongifolium*)

This small shrub is widespread from southeastern states to Central America. Often confused with *stragulum*, it is distinct in its taller habit and more variable leaf sizes, widest near the middle (versus above); see W for a detailed key.

HAB 6,7,4,1 B 3. **ABU** g10? s7? -2.

0528--*Hypericum crux-andreae* (L.) Crantz

Hypericaceae [Clusiaceae*]: *Hypericum* <Ascyrum> *crux-andreae* (*stans*)

This small shrub occurs in southeastern states, mostly on sandy soils of the Coastal Plain. In s. Ky. it is generally restricted to seasonally wet swales and flats with fragipans, which probably have a history of open conditions before settlement, but have become susceptible to agricultural expansion. About half the records date from before 1950.

HAB 9,6 B 4. **ABU** g10 s3 -4.

0529--*Hypericum prolificum* L.

Hypericaceae [Clusiaceae*]: *Hypericum* <Centrosperma> *prolificum* (*spathulatum*)

This is a widespread eastern species. See notes under *lobocarpum*, which may be confused in some western records; 2n = 18 in both species.

HAB 7,10,12,1 D 4. **ABU** g9 s9 -2.

0530--*Hypericum lobocarpum* Gattinger

Hypericaceae [Clusiaceae*]: *Hypericum* <Centrosperma> *lobocarpum* (*densiflorum* var. *l.*)

This is a rather poorly understood species of the central Mississippi Valley. In w. Ky. it is mostly known from relatively species-rich old fields and meadows that may have had open woods or "barrens" before settlement, often on fragipan soils of high terraces and upland swales. *H. lobocarpum* has been confused with typical *H. interior* Small and *H. densiflorum* Pursh, and ranges remain somewhat uncertain (W).

H. interior is an extremely narrow-leaved (ca. 1-4 mm) plant typical of streambanks on calcareous soils in or near the southern Ridge-and-Valley region (D. Estes, pers. comm.); it remains unknown in Ky. but occurs nearby in sw. Va. (Lee Co.). Typical densiflorum has moderately narrow leaves (ca. 3-8 mm) and occurs mostly on acid soils of the southeastern Coastal Plain; it is unlikely to occur in Ky. However, Y has suggested that plants named lobocarpum in Mo. result from hybridization of densiflorum and prolificum, which has larger flowers, smaller inflorescences, and blunter, wider leaves (ca. 7-14 mm). H. lobocarpum does have generally intermediate-sized flowers and leaves (ca. 3-12 mm wide), but it is distinct from both species in its 4-5 styles and locules (versus usually 3), as evident in its lobed capsules.
HAB 7,6,1? C? 4. **ABU** g7? s5? -3.

0531--Hypericum frondosum Michx.

Hypericaceae [Clusiaceae*]: *Hypericum* <Centrosperma> frondosum (aureum)

This is largely restricted to rocky calcareous woods on the southern Interior Low Plateaus and the Gulf Coastal Plain. It is similar to prolificum, but has larger flowers, usually solitary, and its leaves are glaucous (Sm, F, J, W). It has been widely used in horticulture (and locally escaped in eastern states), but not yet in Ky.

HAB 12,11 +\ E 4. **ABU** g8 s7? -1.

0532--Hypericum nudiflorum Michx.

Hypericaceae [Clusiaceae*]: *Hypericum* <Suturosperma> nudiflorum

This is a southeastern subshrub of damp riparian sites (2n = 18). It has reportedly been collected from BALL (R. Athey #313; BA, M), but the coll. has not been relocated (check EKY). There are also old reports from EDMO or WARR (Pr) and perhaps elsewhere (Short et al. 1833). In Tenn. nudiflorum extends north on the Cumberland Plateau to the headwaters of Big South Fork, close to the Ky. border in Fentress Co. on Darrow Ridge (E. Wofford, pers. comm.).

HAB 6,4,9? B? 4? **ABU** g5 s2? -4?

0533--Hypericum adpressum Raf. ex W. Bart.

Hypericaceae [Clusiaceae*]: *Hypericum* <Suturosperma> adpressum

This globally rare rhizomatous herb is widely but thinly scattered in boggy sites from the central Atlantic Coastal Plain to the central Mississippi Valley (W; 2n = 18). It has been overlooked in some regions, and deserves further

search in the field and the herbarium (Y, W). In Ky. it is known only from colls. of R. Athey in BALL (check MEM) and MCRA (NCU) during 1968-70.
HAB 9,6? B? 4? **ABU** g5 s2? -4?

0534--Hypericum sphaerocarpum Michx.

Hypericaceae [Clusiaceae*]: *Hypericum* <Suturosperma> sphaerocarpum ("cistifolium")

This herb occurs in somewhat disjunct calcareous or dolomitic sections of east-central states. It varies greatly in overall stature and leaf width, from drier to damper habitats, but no segregates have been recently recognized. H. sphaerocarpon has often been confused with dolabriforme, especially without flowers. Its leaves tend to be wider (ca. 3-10 mm versus 2-6 mm), the larger ones often with a clasping base, and deeper glossy-green above (versus generally glaucous); plants usually make rhizomatous patches (versus clustered stems with little or rhizome). There has also been confusion in nomenclature with H. cistifolium Lam., which occurs only on the southeastern Coastal Plain.

HAB 12,1 == E 6. **ABU** g8 s7 -3.

0535--Hypericum dolabriforme Vent.

Hypericaceae [Clusiaceae*]: *Hypericum* <Suturosperma> dolabriforme

This is largely restricted to calcareous or dolomitic sections of the Interior Low Plateaus, and it occurs locally around the margins of the southern Cumberland Plateau. See notes under sphaerocarpon.

HAB 12 == E 6. **ABU** g7 s7 -3.

0536--Hypericum pseudomaculatum Bush ? T

Hypericaceae [Clusiaceae*]: *Hypericum* <Hypericum> cf. pseudomaculatum (punctatum var. ps.)

This is a poorly understood, large-flowered relative of punctatum (Y, W). It has been rarely documented in southeastern states (W), and may be largely restricted to Ozarkian regions (D. Estes, pers. comm.). However, all Ky. reports are from Appalachian regions, with a northeastern concentration. B listed pseudomaculatum as rare in open oak woods (formerly with chestnut) of BELL and HARL (check US). The name has also been applied to colls. from GRNP and ROWA at KNK. Further revision is needed to determine if these plants in Ky. are just large-flowered forms of punctatum.

HAB f-7,10? C? 4? **ABU** g8? s4? -3?

0537--Hypericum punctatum Lam.

Hypericaceae [Clusiaceae*]: *Hypericum* <*Hypericum*> *punctatum*
This widespread eastern diploid (2n = 16) varies much in leaf shape, from subclasping or sessile, to oblanceolate and tapering with a distinct petiole. The latter form has been named *H. subpetiolatum* Bickn., but it has not been segregated in recent treatments.
HAB F-10,7 D 4. **ABU** g10 s10 +1.

0538--*Hypericum perforatum* L.

Hypericaceae [Clusiaceae*]: *Hypericum* <*Hypericum*> *perforatum*
This tetraploid (2n = 32) is a widespread weed in temperate North America that was present in Ky. early after settlement (Short et al. 1833). Rafinesque (1936, 1:31) expressed uncertainty about its naturalized versus native status in North America.
ALI EU. **HAB** F-10 D 5. **ABU** +5.

0539--*Hypericum mutilum* L.

Hypericaceae [Clusiaceae*]: *Hypericum* <*Trigonobrathys*> *mutilum*
This is a widespread eastern annual or short-lived perennial on damp, acid soils, especially in disturbed areas. Further review of colls. is desirable, in order to assess variation within *mutilum* and to check for the presence of two related species: the southeastern *H. gymnanthum* Engelm. & Gray, and the northeastern *H. boreale* (Britt.) E. Bickn. Both of these species are known in Ill., Ind. and Ohio (K). Also, hybrids can be expected among these species and with *canadense*; 2n = 16 in all cases (Cr, F, W).
HAB f-9,6 :: B 4. **ABU** g10 s10 -1?

0540--*Hypericum canadense* L.

Hypericaceae [Clusiaceae*]: *Hypericum* <*Trigonobrathys*> *canadense*
This is a largely northeastern annual or short-lived perennial (with short stolons) of damp acid soils, especially where disturbed.
HAB f-9,10 ::: B 6. **ABU** g10 s5 -4.

0541--*Hypericum virgatum* Lam.

Hypericaceae [Clusiaceae*]: *Hypericum* <*Trigonobrathys*> *virgatum* (*denticulatum** var. *recognitum*)
This perennial diploid (2n = 24) occurs in southeastern states east of the Mississippi Rv. It has been erroneously combined with the related diploid *H. harperi* R. Keller (centered on the Coastal Plain of Ga.) or the tetraploid *H. denticulatum* Walter (mostly along the Atlantic Coastal Plain), but nomenclature has now been clarified (W; Allison 2011). In Ky. it is a

somewhat conservative plant of southern regions, growing in remnants of open grassy woods or "barrens" on moderately dry, acid soils.
HAB 10,7,1 B 4. **ABU** g8 s7 -3.

0542--*Hypericum gentianoides* (L.) B.S.P.

Hypericaceae [Clusiaceae*]: *Hypericum* <*Brathys*> *gentianoides*
This is a widespread eastern annual, especially on xeric, sterile, acid substrates.
HAB 12,10 == B 6. **ABU** g10 s9 -1.

0543--*Hypericum drummondii* (Grev. & Hook.) Torr. & Gray

Hypericaceae [Clusiaceae*]: *Hypericum* <*Brathys*> *drummondii*
This is a widely scattered southeastern annual. It tends to occur on less xeric sites than the related species, *gentianoides*; 2n = 24 in both species.
HAB f-10,12,7 :: B 4. **ABU** g9 s8 -3?

0544--*Triadenum walteri* (J.G. Gmel.) Gleason

Hypericaceae [Clusiaceae*]: *Triadenum* [*Hypericum*] *walteri*
This is a widespread southeastern species of swampy woods and marshes.
HAB 3,6 C 2. **ABU** g8 s8 -3.

0545--*Triadenum tubulosum* (Walt.) Gleason

Hypericaceae [Clusiaceae*]: *Triadenum* [*Hypericum*] *tubulosum*
This is widespread in southeastern wetlands, riparian zones and other shorelines. It is less concentrated in deep wooded swamps than *walteri*.
HAB 2,3,6,9 C 3. **ABU** g9 s8 -3.

0546--*Triadenum virginicum* (L.) Raf. R

Hypericaceae [Clusiaceae*]: *Triadenum* [*Hypericum*] *virginicum*
This is known mostly on the Coastal Plain and in the Great Lakes region, but there are occasional records further inland, such as on the Cumberland Plateau in Tenn. (Ch). It has been reported from Ky. by BT, J and others (M). Colls. from ADAI (for Field) and CLIN (for EKY) may exist, but these have not been located and verified.

0547--*Podostemum ceratophyllum* Michx.

Podostemaceae: *Podostemum ceratophyllum*
This alga-like flowering plant of rocky riverine riffles is widely distributed in rocky river beds from eastern North America to Central America. It has fascinated botanists in Ky. and elsewhere since European settlement (Meijer

1976). Short (1836) noted: "the humble but useful *Podostemum ceratophyllum*, confined to the shoals of the most rapid rivers, where it serves to protect the channel from the fury of the current, by binding together gravel, shells, and stones, on one impenetrable mass."

Podostemum has disappeared from several lower stretches of rivers in Ky., especially where impounded or locked-and-dammed. A. Michaux's type was from the Falls of the Ohio (JEFF); plants are now unknown in the Ohio Rv. bordering Ky. C.W. Short found it in the main stem of Kentucky Rv. (probably FAYE or MADI); plants are now unknown in the Kentucky Rv. downstream of the forks at Booneville (OWSL). It does remain locally abundant along the South Fork of Kentucky Rv., where flowers were collected in 1992 (KY). It also remains scattered along some tributaries of the Cumberland Rv., the Green Rv., the Licking Rv. and the Big Sandy Rv.
HAB 1 ~ C 5. **ABU** g10 s5 -3.

0548--*Elatine triandra* Schkuhr. R

Elatinaceae: *Elatine triandra* {sensu lato; with *americana*, *brachysperma*} In its broad sense, this diminutive species of drying shorelines is widely scattered over the Northern Hemisphere, but several segregates have been recognized as varieties or species in North America. There are no verified records from Ky., but it is expected (BT, M). The southeastern *E. americana* (Pursh) Arn. was reported from Ky. by Linney (1882) but no colls. are known. The largely southwestern *E. brachysperma* Gray is known from c. Ill. and c. Ohio (PL) and may also be expected. Virtually all records of the genus in southeastern states are from artificial impoundments (W; P. Cox, pers. comm.).

0549--*Linum grandiflorum* Desf. C

Linaceae: *Linum* <*Linum*> *grandiflorum*

This robust red-or pink-flowered species is occasionally grown for ornament, but there is little evidence of naturalization in North America. There are colls. from CAMP and MADI (KNK), which are presumed to represent local escapes from "wildflower" sowings.

ALI AF.

0550--*Linum usitatissimum* L. C

Linaceae: *Linum* <*Linum*> *usitatissimum*

This annual crop plant (flax) is a widely grown cultigen ($2n = 30$) that may be not be truly naturalized, but there are records from FULT (R. Athey), MADI

(KNK) and PULA (BEREA). Although not much cultivated in Ky. during recent decades, it has been widely distributed across southeastern states for ornamental use along roads.

Two other blue-flowered species may be expected and confused with *usitatissimum*. *L. perenne* L., from Europe ($2n = 18$); and *L. lewisii* Pursh, from western states but often distributed as a "wildflower" in eastern states and apparently native in W.Va. Both have smaller capsules than *usitatissimum*, distinctive capitate stigmas, and eciliate inner sepals (W). Further checking of identifications is needed.

ALI EU.

0551--*Linum sulcatum* Riddell

Linaceae: *Linum* <*Rigida*> *sulcatum*

This annual ($2n = 30$) of rocky glades and prairies occurs mostly in the northern Great Plains and midwest, but with scattered populations east to the hills of W.Va., Va. and N.C. (W). Eastern plants are largely restricted to dry calcareous glades or associated remnants of native grassland. A. Cusick's disjunct coll. (# 28309; check CM) from BATH comes from Sand Road (Ky. 1269) west of Hedrick Church, together with another rare plant, *Orbexilum onobrychis*.

HAB r-12,10 + D 5. **ABU** g10 s6 -3.

0552--*Linum floridanum* (Planch.) Trel. R

Linaceae: *Linum* <*Linopsis*> *floridanum*

This perennial and the closely related *L. intercursum* Bickn. are concentrated on the Coastal Plain to the south and east, respectively. However, disjunct occurrences do occur to the north in both cases (K, PL). BA reported *floridanum* from the Coastal Plain of Ky., but colls. have not been located.

HAB 10,7,12 B? 4? **ABU** g8 s1? -2?

0553--*Linum texanum* Planch.

Linaceae: *Linum* <*Linopsis*> *texanum* (medium var. t.*)

This perennial is widespread in eastern states (except the upper midwest), usually on dry, medium-acid soils. It tetraploid ($2n = 36$) like most others in sect. *Linopsis*. However, it is often combined as a variety with the closely related octoploid ($2n = 72$), *L. medium* (Planch.) Britton, which is known only around Lakes Erie and Ontario (Cr.).

HAB f-10,12 ::? C 5. **ABU** g10 s9 -3.

0554--*Linum striatum* Walt.

Linaceae: *Linum* <*Linopsis*> *striatum*

This perennial is a widespread southeastern species of wet acid soils.

HAB f-9,6 ::? B 4. **ABU** g9 s9 -3.

0555--*Linum virginianum* L.

Linaceae: *Linum* <*Linopsis*> *virginianum*

This perennial occurs mostly in eastern states, centered on the Appalachians (from e. S.C. and Mass. to s. Mo. and s. Ont.). The few records from w. Ky. need to be rechecked.

HAB 7,11 ::? B 4. **ABU** g9 s9 -2.

0556--*Viola hastata* Michx.

Violaceae: *Viola* <*Chamaemelum*> *hastata*

This largely Appalachian species is restricted to relatively acid, infertile soils. In addition to its distinctive mottled hastate-deltoid leaves, its rhizomes are long, fleshy and whitish (versus short, subligeous and yellowish-brown in the pubescens group).

HAB 11,5 A 1. **ABU** g9 s8 -1.

0557--*Viola tripartita* Ell. var. *glaberrima* (DC.) Harper

Violaceae: *Viola* <*Chamaemelum*> *tripartita** var. *glaberrima*

This unlobed segregate may be most common on the Cumberland Plateau, but it also occurs elsewhere in the Southern Appalachians and some disjunct localities on the Interior Low Plateaus. It is much more frequent than var. *tripartita* in Tenn. (Ch), Ky. and Ohio (D. Boone, pers. comm). There has also been confusion (e.g. in B) with *pubescens* (sensu lato), which is usually a more robust plant with upright or spreading growth forms; hybrids are suspected in a few cases and mapped as open circles.

Compared to *pubescens* (and *pensylvanica*), *V. tripartita* var. *glaberrima* is a strictly upright plant that is usually distinguishable by the cuneate to truncate bases of its upper cauline leaves (versus more or less cordate in *pubescens*). Also, basal leaves are usually lacking on flowering stems (versus usually 2 or more in *pubescens*); its leaves are generally deeper bluish green and less closely serrated. Klaber (1976) noted and illustrated "running stolons" that are not known in *pubescens*. There are no clear differences in flowers or fruits, but further analysis is needed. Var. *glaberrima* typically occurs in the transition from mesic to suberic woods on medium acid soils.

HAB 11,5 C 1. **ABU** g8 s7 -1.

0558--*Viola tripartita* Ell. var. *tripartita*

Violaceae: *Viola* <*Chamaemelum*> *tripartita* var. *t.*

Compared to var. *glaberrima*, these unlobed plants may be more concentrated on relatively dry base-rich sites in the Southern Appalachians, with fewer outlying localities, but ranges remain somewhat uncertain. The only record from Ky. is a coll. of B (#3945 at NY and US) from CART.

HAB 11? D? 2? **ABU** g8 s2 -1.

0559--*Viola pensylvanica* Michx.

Violaceae: *Viola* <*Chamaemelum*> *pensylvanica* (*pubescens* var. *scabriuscula**; *eriocarpa*)

This is widespread in damp, medium acid woods across eastern North America, except on the southeastern Coastal Plain. Traditionally, it has been known as a species; see key in F. But more recently it has generally been treated as a variety of *pubescens* (e.g. Cr, McKinney & Russell 2002), and there has been much confusion in midwestern regions (e.g. D, St). A full revision is still needed. Mapped records include the glabrous-fruited var. *leiocarpa* (Fern. & Wieg.) Fern., which may not deserve distinction.

HAB 5 C 1. **ABU** g10 s10 -2.

0560--*Viola pubescens* Ait.

Violaceae: *Viola* <*Chamaemelum*> *pubescens* (var. *p.**)

This is widespread in relatively undisturbed, mesic woods on fertile soils across eastern North America, but it is uncommon to rare in the lower Ohio and central Mississippi Valleys and virtually absent on the southeastern Coastal Plain (D, ML, Sm, F, W). Mapped records include the glabrous-fruited var. *peckii* House, which may not deserve recognition.

HAB 5 D 1. **ABU** g9 s9 -3.

0561--*Viola canadensis* L.

Violaceae: *Viola* <*Chamaemelum*> *canadensis* (var. *c.*)

This species is a widespread northern tetraploid: $2n = 24$, versus usually 12 in others of section *Chamaemelum*. Typical *canadensis* has a northeastern range. A few colls. from Ky. have been named var. *corymbosa* Nutts. ex Torr. & Gray, which is not recognized in recent treatments, or var. *rugulosa* (Greene) C.L. Hitchc. Var. *rugulosa* applies to more western plants with relatively long rhizomes and broader, hairier leaves, but has been misapplied in Appalachian regions (W).

HAB 5 D 1. **ABU** g10 s9 -2.

0562--Viola bicolor Pursh

Violaceae: *Viola* <*Melanium*> *bicolor* (*rafinesquii*, *tenella*; *kitaibeliana* var. r.)
 This annual is widespread across eastern and central states. The first records of these plants from Ky. were under the name *V. tenella* Raf. ex Muhl. (Merrill 1949; see also, Short & Peter 1834). Most recent treatments have maintained *bicolor* as a distinct species (Cr; McKinney & Russell 2002; W), although it is closely related to the southern European *V. kitaibeliana* Schult. and has been combined by some previous authors (e.g. F). Chromosome numbers in this weedy complex range from $2n = 14$ or 16 to 48 (Yockteng et al. 2003), but morphological and biogeographic differences are not well documented. Plants with deep blue flowers may deserve more attention, and colls. should be reexamined for potential segregation. See also notes under *arvensis*.

HAB S-10 ::: D 6. **ABU** g10 s10 +1?

0563--Viola bicolor Pursh {deep blue variant}

Violaceae: *Viola* <*Melanium*> *bicolor* {deep blue variant}
 The flowers of these plants are mostly deep blue, versus bluish-white (or lavender) to pale yellowish-white (creamy); flower centers are paler in all plants. This variant does not have a published name, but is mapped here to show its southern distribution in Ky. and to prompt further study. Only a few authors have noted "deep" blue in their descriptions (Cr.)

HAB S-10 ::: C? 6. **ABU** g9? s8 +1?

0564--Viola tricolor L. C

Violaceae: *Viola* <*Melanium*> *tricolor* {+ hybrids}
 This annual or biennial may not be truly naturalized, but there are colls. of possibly escaped plants in BOON, BULL, FAYE, JEFF, MADI and PIKE. *V. tricolor* is a common Eurasian weed that is also cultivated (as "wild pansy" or "Johnny-jump-up"); $2n = 26$. The large-flowered horticultural "pansies" have varied hybrid origins from *tricolor* and other Eurasian species, and are generally known as *V. X wittrockiana* Gams; usually, $2n = 48$. These plants are now extensively used for annual flower beds, but there is no evidence of escapes in Ky.

ALI EU. **HAB** H-10 ::: D 5. **ABU** +4?

0565--Viola arvensis Murr.

Violaceae: *Viola* <*Melanium*> *arvensis*

This annual is widely scattered in cultivated fields and roadsides across temperate North America. Without fresh flowers, *arvensis* is sometimes hard to distinguish from *bicolor* (Sm, F, Cr); $2n = 34$ in both species, but hybrids have not been documented. In addition to their distinctively short petals (about equalling sepals or less), flowers of *arvensis* are strictly open-pollinated (versus often cleistogamous in *bicolor*), and pale yellow to occasionally purplish-tipped (versus pale yellow to deep blue). Also, its stipules are pinnately lacinate (versus palmately pectinate), with the enlarged upper lobes oblanceolate (versus narrowly spatulate) and, like the cauline leaves, crenate-serrate (versus entire or nearly so).

ALI EU. **HAB** F-10 ::: D? 6. **ABU** +4.

0566--Viola rostrata Pursh

Violaceae: *Viola* <*Viola*> *rostrata*

This has a northeastern and Appalachian range. In Ky. and Tenn. (Ch) there are only a few small outlying populations west of the Appalachian Cliff Section, especially along major rivers and in the southern Knobs. In Ky. and elsewhere, there are occasional hybrids with related species, including *striata*, *conspersa* and *walteri* (B, Cr, M); $2n = 20$ throughout this group.

HAB 5,4 C 1. **ABU** g9 s9 -2.

0567--Viola walteri House

Violaceae: *Viola* <*Viola*> *walteri* (var. w.)

This has a fragmented range across southeastern states, usually occurring on dry base-rich soils. Some records mapped here are based on colls. that are unaccessed or missing: EDMO (MM for WKY, from a sandy cemetery near Mammoth Cave); GRAY (records at KSNPC); and HARD (formerly at KY, from Eastview Barrens). Such records need to be rechecked for possible confusion or hybridization with *rostrata*.

V. appalachiensis L.K. Henry has been considered a distinct species (Ballard & Wujek 1994), but treated by some authors as a var. of *walteri*, with less hairy leaves and less lacerate stipules (McKinney 1992; W). It occurs in central Appalachian regions and has been reported close to Ky. in s. W.Va. (HFG). It may be expected here, especially along trails in subseric woods on medium-acid soils.

HAB 12 +\ E 3. **ABU** g9 s4 -1.

0568--Viola conspersa Reichenb.

Violaceae: *Viola* <*Viola*> *conspersa* (*labradorica**)

This occurs in cool temperate regions of northeastern U.S.A. and southeastern Canada. It has been combined by H. Ballard (unpublished, cited by W) with *V. labradorica* Schrank (= *V. adunca* Sm. var. *minor* (Hook.) Fern.), which occurs in boreal and alpine regions. Although such treatment has been followed by some authors (e.g. J, W), complete combination seems dubious to others (e.g., Cr, K). *V. conspersa* has been distinguished (Cr) by its broadly lanceolate (versus lance-linear) stipules, bristly-toothed over half their length (versus less than half), and leaves more or less strongly cordate (versus subtruncate to subcordate).

HAB 4,5 :: C 2. **ABU** g9 s8 -1.

0569--*Viola striata* Ait.

Violaceae: *Viola* <*Viola*> *striata*

This is widespread in east-central states. Hybrids with other species of section *Viola* in this area are rarely reported; although all are diploids ($2n = 20$), their habitats are generally distinct.

HAB 7,4,10 :: D 3. **ABU** g10 s10 -2.

0570--*Viola rotundifolia* Michx.

Violaceae: *Viola* <*Rotundifoliae*> *rotundifolia*

This distinctive Appalachian and northeastern species is restricted to relatively acid infertile soils, especially in mesic coniferous woods ($2n = 12$).

HAB 5 A 1. **ABU** g8 s8 -1.

0571--*Viola blanda* Willd.

Violaceae: *Viola* <*Plagiostigma*> *blanda* (var. *b.*)

This northeastern species extends south into Appalachian regions, where it is typical of mesic acid soils under *Tsuga canadensis*, *Betula lenta* and associated trees. Although largely Appalachian in Ky., it does occur further west in a few disjunct sandstone ravines of the Shawnee Hills. It is also known from several sites in s. Ohio and s. Ind. (K).

HAB 5 A 1. **ABU** g9 s9 -1.

0572--*Viola incognita* Brainerd T

Violaceae: *Viola* <*Plagiostigma*> *incognita* (*blanda* var. *palustriformis*)

This northeastern taxon differs little from *blanda*, and is not distinguished in some recent treatments (e.g. Cr; McKinney in J). Its petioles and peduncles are green (versus often reddish or purplish); its leaves are ascending (versus soon spreading), rugulose (versus flat), and more or less pubescent below (versus glabrous). *V. incognita* occurs in somewhat open areas with more

moisture stresses, while *blanda* is largely restricted to mesic forests (F). In Ky. colls. have been reported from EDMO (US) and perhaps elsewhere (Russell 1965), but these records remain dubious (M).

0573--*Viola pallens* (Banks ex Ging) Brainerd R

Violaceae: *Viola* <*Plagiostigma*> *pallens* (*macloskeyi* ssp. *p.*)

This northeastern species (sometimes combined with the western *V. macloskeyi* F. Lloyd) extends south into the Appalachians, mostly at higher elevation. It is absent from most of the Ohio Valley. There have been a few reports from Ky. but at least partly based on misidentifications of *blanda* (M). There is a reported coll. from Cumberland Mt. in BELL (TENN) that needs verification; see also NCU.

Compared to *blanda*, *pallens* is a more northern diploid ($2n = 24$ versus 48) typical of somewhat hydric sites. It differs in its completely glabrous blades; *blanda* has scattered small appressed hairs on upper surfaces, at least toward the base when young. In *pallens*, peduncles are usually longer than leaves and green (versus peduncles more or less equal to petioles, with both usually reddish or purplish). Its upper petals are typically less reflexed or twisted and broader; and its capsules are green (versus more or less purple).

0574--*Viola primulifolia* L.

Violaceae: *Viola* <*Plagiostigma*> *primulifolia*

This southeastern species is closely related to *lanceolata*, which has a more widespread eastern range (F, Cr, W). Both occur in boggy soils but *lanceolata* typically occurs in more open and seasonally drier sites. Hybrids have been reported but need better documentation; $2n = 24$ in both species.

HAB f-9,6 :: A 4. **ABU** g9 s8 -3.

0575--*Viola lanceolata* L.

Violaceae: *Viola* <*Plagiostigma*> *lanceolata*

This is widely scattered across eastern North America, but concentrated in coastal regions and around the western Great Lakes (K). Inland, its populations are more fragmented, in association with seasonal wetlands on acid soils. See notes under *primulifolia*.

HAB f-9 :: B 5. **ABU** g10 s7 -4.

0576--*Viola cucullata* Ait.

Violaceae: *Viola* <*Boreali-Americanae*> *cucullata* (*obliqua*)

This widespread northeastern species is the only stemless blue violet known in Ky. that is restricted to truly hydric sites (as opposed to temporarily flooded or seasonally wet sites). It is generally distinct, but can intergrade locally with *affinis* and (further north) *nephrophylla* (F). Seeds are relatively small and blackish. Flowers are relatively small and pale, with strongly clavate hairs on lateral petals and on the spurred petal. Peduncles are relatively long, overtopping leaves for regular flowers, and erect even for the cleistogenes, which are relatively elongated with auricles nearly as long as sepals. Leaves are relatively small and narrow (at least the upper ones), pale (often yellowish when dried), generally glabrous or sometimes with scattered short hairs above. **HAB** 6,9,1 :: B 4. **ABU** g9 s8 -3.

0577--*Viola nephrophylla* Greene R

Violaceae: *Viola* <Boreali-Americanae> *nephrophylla* (?*pratincola*)
This is a widespread northern and western species of base-rich wetlands (F, K, PL), that has been reported near Ky in s. Ill. (ML), c. Ind. (Russell 1965), s. Ohio (Greene Co., from pers. comm. with D. Boone) and s. W.Va. (HW+). *V. pratincola* Greene was listed for Ky. by BA but with no details. That name has been considered a synonym of *nephrophylla* (McKinney 1992), but it has also been used for plants appearing at least transitional to *papilionacea* (F; Correll & Johnston 1970) or *affinis* (Gil-ad 1997, 1998).

0578--*Viola missouriensis* Greene

Violaceae: *Viola* <Boreali-Americanae> *missouriensis* (*sororia* var. *m.*; ?*langloisii*)

This occurs mostly in the central and lower Mississippi Valley, usually in woods on damp, circumneutral to slightly acid, clayey terraces (D). Although generally distinct, it is sometimes hard to distinguish from *affinis* and *papilionacea*, and probably intergrades with them; see notes under those species. *V. langloisii* Greene is a name that has been used for some of the "missouriensis" mapped here, or perhaps for transitions to the other species (Sm; Correll & Johnston 1970; see also colls. at NY). If synonymous, *langloisii* may have priority due to its earlier publication.

Compared to *affinis*, *missouriensis* has well-developed leaves that are completely glabrous (versus slightly hairy above), deltoid-ovate and relatively narrow, sometimes coarsely dentate at base, and attenuate with slight concavity to the apex (versus more broadly ovate-orbicular and acute or abruptly pointed). Based on varied descriptions, sepals tend to be finely ciliate over most or all of the margin (versus only in lower half) (Gil-ad 1997);

flowers tend to be relatively pale lilac or lavender, around the darker center (St); and the spurred petal is not distinctly bearded as in typical *affinis* (F). **HAB** 6,4 :: D? 2. **ABU** g9? s8 -3.

0579--*Viola affinis* Le Conte

Violaceae: *Viola* <Boreali-Americanae> *affinis* (*sororia* var. *a.*)

This widespread eastern species appears to intergrade with several other stemless blue violets; $2n = 54$ in all species of this section. *V. affinis* could be combined with the following, as varieties or subspecies: (1) the glabrous *missouriensis*, with deltoid-ovate leaves; (2) the largely glabrous *papilionacea* (to which *V. latiuscula* Greene may be transitional); and (3) the more uniformly pubescent *sororia*. McKinney & Russell (2002; J) have included *affinis* completely within *missouriensis*, as a variety of *sororia*, but some authors have continued to recognize it (Gil-ad 1997, 1996; W). Identification is often difficult and some records mapped here are tentative.

V. affinis differs from *sororia* and *papilionacea* in having hairs on its spurred petal as well as the laterals (like *cucullata*); its cleistogenes are on ascending to erect peduncles (approaching *cucullata*); and may be the only species of Boreali-Americanae with hairs on the capsule (Gil-ad 1997, 1998). Its leaves tend to be relatively small, narrow and somewhat deltoid, gradually tapering to acutish tips (approaching *missouriensis*); they are more densely reddish-punctate, and generally glabrate except for small thinly scattered hairs confined to the upper surface, especially on the basal lobes. *V. affinis* can also intergrade with *hirsutula* (typically on drier sites), which has hairs scattered more widely over upper leaf surfaces. Based on Sm, D, B, F and personal experience, typical habitat for *affinis* is moist or damp woodlands and edges, especially in gullies or near streams on relatively acid, sandy soils (in contrast to *papilionacea* and *missouriensis* on more clayey soils).

HAB 5,4,7,6 :: B 4? **ABU** g9? s9 -2.

0580--*Viola papilionacea* Pursh p.p.

Violaceae: *Viola* <Boreali-Americanae> *papilionacea* {suggested: *sororia** var. *p.*; ?*latiuscula*}

Although combined with *sororia* in some treatments (e.g. Cr, McKinney 1992, J), this taxon has often been considered a largely distinct species typical of eastern North America, usually on fertile submesic soils in floodplain woods, mowed open areas, yards, and other disturbed sites (Robinson & Fernald 1908; D, Br, F, Gl, St). In the central Bluegrass, Short (1828-9) misapplied the name *cucullata* to these plants: "This is with us the most abundant of the

violets, as well as the first to bloom; the whole surface of moist meadows and pastures being covered with them in the fore part of April."

V. papilionacea is close to *sororia* and *affinis*, and all three could be treated as as intergrading segregates of *sororia*. Also, some plants appear hybridized with *missouriensis*, *cucullata* or other related species (Gil-ad 1997, 1998). *V. papilionacea* differs from *sororia* in its generally paler, broader, and largely glabrous or glabrate leaves (except sometimes for hairs on petioles and on lower leaf surfaces at the base). After flowering, relatively large broad leaves are often produced.

The correct name for these plants remains uncertain; a good type for *papilionacea* is not available (McKinney 1992). Other names that have been used, at least for transitions to other species, include *V. latiuscula* Greene in northeastern region (F) and *V. pratincola* Greene in midwestern regions (e.g. Correll & Johnston 1970; Mohlenbrock 1988).

HAB s-7,4,10 :: D 3. **ABU** g10 s10 =?

0581--*Viola papilionacea* Pursh var. *priceana* (Pollard) Alexander ?

Violaceae: *Viola* <Boreali-Americanae> *papilionacea* cf. var. *priceana* (+ forma *albiflora*)

Mapping here is tentative; varied whitish or grayish flowered forms of *papilionacea* are included. Such plants are sometimes cultivated in eastern North America, but often seem to originate from native plants. They may deserve some recognition, but not full species status.

Some authors (e.g. Sm) have indicated that the southeastern form known as *priceana* (or "Confederate Violet"), which has grayish petals with blue veins converging in the center, is distinct from simple albinos and deserves special attention. That taxon was originally described from yards in Bowling Green, Ky. (WARR), and potential records of native plants are mapped here from elsewhere in central Ky. It has also been considered native in Ark., Ill., Tenn., W.Va., Pa., Ga., S.C. and N.C. However, *priceana* has been widely cultivated in eastern states, often spreading into mowed areas.

HAB s-10,7 :: D 4? **ABU** g8? s6? +2?

0582--*Viola sororia* Willd.

Violaceae: *Viola* <Boreali-Americanae> *sororia* (var. s.)

This widespread eastern species appears to intergrade with *papilionacea* and *affinis* at some sites; see notes under those names. There also appear to be

occasional hybrids with *hirsutula*, *palmata* (= *triloba*) and other species. In cooler regions, it may be more difficult to separate *sororia* from *papilionacea*, with plants known as *V. septentrionalis* Greene appearing intermediate (Cr, W). Leaf pubescence may be the most obvious difference from *papilionacea*, with *sororia* persistently pubescent on both leaf surfaces (versus generally glabrous or glabrate except sometimes for petioles or basal parts of blades); leaves are often relatively dark green and generally lack purplish hues.

HAB 5,11,7 D 2. **ABU** g10 s10 -2.

0583--*Viola hirsutula* Brainerd

Violaceae: *Viola* <Boreali-Americanae> *hirsutula* (*sororia* var. h.)

This occurs mostly in woods on moderately dry, acid soils in Appalachian regions or nearby, with scattered records north to Vt., south to Fla., west to s. Ind. and w. Ky. It is generally distinct in its spreading petioles, with blades that often lie near the ground; also, blades are generally small, often purple-tinged below, with blunt to rounded apices, and with hairs confined to upper surfaces.

V. hirsutula is close to the southeastern *V. villosa* Walt., and it seems to hybridize often with other species: *sororia*, *affinis*, *papilionacea*, *palmata*. The colls. mapped here from FRAN (EKY) and HENR (KY) may be hybridized with *sororia*. Some Ky. colls. are glabrate or virtually glabrous, suggesting introgression with *affinis*. The consistency of pubescence patterns in these taxa needs more critical attention for descriptions and keys.

HAB 11,5,7 B 2. **ABU** g9? s9 -1.

0584--*Viola stoneana* House ?

Violaceae: *Viola* <Boreali-Americanae> cf. *stoneana* {suggested: *palmata* var. s.}

The correct name for these somewhat miscellaneous plants remains uncertain. They are close to *palmata* (= "triloba" of F), but with largely glabrous, glabrate or minutely pubescent leaves (F). They could reasonably be treated as a variety of *palmata*, but may have resulted from hybridization (Gil-ad 1997, 1998). A few unmapped Ky. colls. with less lobing appear to grade into *affinis*, *papilionacea* or *hirsutula*.

The plants mapped here may be affiliated with a group of taxa that have been described in the central Appalachians (*stoneana* House), Coastal Plain (*chalcosperma* Brainerd, *esculenta* Ell., *lovelliana* Brainerd), and midwest (*viarum* Pollard). Some of these names may represent reasonable taxa with

different hybrid origins (Gil-ad 1997; W). Within Ky., the name *stoneana* has been applied to more deeply lobed plants of this group (with several hybrids according to F), including colls. of B (US) and her contemporaries from Ky. (LETC, LEWI, WHIT). The names *esculenta* or *lovelliana* have been applied to colls. from MCRA (Russell 1965) and from further east (M. Wharton colls. at DHL, MICH, EKY & NY), but have been considered synonymous with *palmata* (or "*triloba*") in some recent treatments (Gil-ad 1997, McKinney & Russell 2002).

HAB 11,5,7 B 2. **ABU** g9? s8? -1.

0585--*Viola palmata* L.

Violaceae: *Viola* <Boreali-Americanae> *palmata* (var. *p.*, *triloba*)
This widespread eastern taxon was known as *V. triloba* Schwein. after Robinson & Fernald (1908). It is closely related and often confused with *subsinuata*, to which the name *palmata* was misapplied, according to McKinney (1992). *V. palmata* occurs in habitats similar to those of *sororia*, but is concentrated on drier, poorer soils, often in oak-hickory woods rather than sugar maple-basswood.

A few Ky. colls. have some leaves with deeper or more numerous lobes (but early leaves still more or less unlobed). Some of these plants have been named *V. triloba* var. *dilatata* (Ell.) Brainerd, which may be transitional to *subsinuata*. Such colls. are known from LYON (M. Wharton #9795 at EKY), JEFF (P.A. Davies 17 May 1947, at DHL); HART and WAYN (B's colls. at US). In contrast, there are some collections with less lobing that appear hybridized with *sororia*, *hirsutula* or other species.

HAB 11,5,7 C 2. **ABU** g10 s9 -2.

0586--*Viola subsinuata* Greene

Violaceae: *Viola* <Boreali-Americanae> *subsinuata* ("*palmata*")
This may be widely scattered in east-central and midwestern states, but there has been continuing uncertainty about nomenclature (Gil-ad 1997, 1998). It has been erroneously named *V. palmata* in the past, according to McKinney (1992); see notes under that species. *V. subsinuata* is typical of rocky calcareous woods, while true *palmata* (formerly known as *triloba*) generally occurs on medium acid soils. However, these species do appear to intergrade in some cases.

HAB 11,12 D 3. **ABU** g9 s8 -2.

0587--*Viola pedatifida* G. Don T

Violaceae: *Viola* <Boreali-Americanae> *pedatifida* (*palmata* var. *pe.*)

This species of the Great Plains, with deeply lobed leaves, is recorded east to sw. Ohio and wc. Va. (K, NS, PL, W; but see McKinney & Russell 2002). It should be looked for further in Adams Co., Ohio, and Lewis Co., Ky. It has been reported a few times from Ky. but apparently based only on misidentified plants of *egglestonii* or *palmata* (M), with which it may intergrade (Cr).

0588--*Viola egglestonii* Brainerd

Violaceae: *Viola* <Boreali-Americanae> *egglestonii* (*septemloba* ssp. *e.**)
This is restricted to limestone glades in s. Ind., c. Ky., c. Tenn., n. Ala. and n. Ga. It appears closely related to *V. septemloba* LeConte, and has been combined as a subspecies by McKinney (1992). However, *septemloba* typically occurs in piney woods on sandy soil of the Coastal Plain, and there is virtually no known overlap or intergradation with *egglestonii*; see also Gil-ad (1997, 1998). There has also been some misidentification as the more western species, *pedatifida*. An apparent hybrid with *palmata* (or perhaps *sororia*) has been collected from NELS (Gunn #2058 at EKY).

HAB 12 == E 6. **ABU** g7? s6 -2.

0589--*Viola emarginata* (Nutt.) Le Conte

Violaceae: *Viola* <Boreali-Americanae> *emarginata* (*sagittata** var. *e.*)
This southeastern species is mostly known from woodlands on rather dry acid soils in southern Appalachian and east-coastal regions. It was initially described as *V. sagittata* var. *emarginata* Nutt., and may intergrade locally with *sagittata* or *fimbriatula*. It has often been confused or combined with those two species, especially in the midwest (St); it appears to be the plant illustrated in J under *sagittata*. Morphology suggests that it originated from hybrids of *sagittata* and *affinis* (Russell & Risser 1960).

V. emarginata differs from *sagittata* in its leaf blades, which are nearly triangular (versus narrowly lanceolate to lance-oblong), with l/w ca. 1.2-2 (versus 2.2-2.8), and with long petioles in later leaves, which overtop the flowers. Also, leaves are relatively dark green and consistently glabrous (which also helps distinguish it from *fimbriatula*). Most material in Ky. may be referable to the largely Appalachian form known as var. *acutiloba* Brainerd, with later leaves sharply lacerate at base, the lobes 1-2.5 cm long (F).

Despite its neglect in recent treatments, *emarginata* seems the most appropriate name for this distinct group of plants, which are restricted within Ky. to Appalachian regions, growing usually in dry open oak and pine woods with ericaceous shrubs on sandy ridges with acid infertile soils. There are relatively few colls. in herbaria (see also GH, NCU, NY, US), but field work indicates that this species is a consistent member of the diverse flora of such woodlands (e.g. B, Campbell et al. 1991).

HAB 11,12,10 B 3. **ABU** g9 s8 -2.

0590--*Viola fimbriatula* Sm.

Violaceae: *Viola* <Boreali-Americanae> *fimbriatula* (*sagittata* var. *ovata**) This appears to be a distinct species in northeastern and eastern states (Gil-ad 1997, W), but it may intergrade with typical *sagittata*, especially in the midwest (e.g. D). *V. fimbriatula* differs (Gil-ad 1997) in its oblong to oblong-ovate blades (versus narrowly lanceolate to lance-oblong in *sagittata*), with l/w 1.5-1.8 (versus 2.2-2.8) and base cordate to subcordate (versus *sagittata*). It typically occurs in somewhat hilly areas (versus mostly flatlands for *sagittata*), often on more coarse-textured soils and in open woods, along roads or edges (versus full sun).

Colls. from the Pine Creek area in BULL (JC for KY) may be transitional to *sagittata*, with larger plants approaching typical *sagittata* in leaf shape but remaining less distinctively lobed and relatively pubescent. A coll. of Wharton from LINC (#1771 at EKY) was initially named *fimbriatula* but is excluded here. It seems generally similar to *sororia*, perhaps introgressed with *fimbriatula* or another species with relatively small blunt leaves.

HAB r-10,12 :: C 4. **ABU** g10 s6 -3?

0591--*Viola sagittata* Ait.

Violaceae: *Viola* <Boreali-Americanae> *sagittata* (var. *s.**) This is a widespread southeastern taxon. In Ky. some plants from BULL appear transitional to *fimbriatula* (see notes under that name), which, like *emarginata*, has been considered a variety or subspecies of *sagittata*. There also appears be local introgression with *hirsutula*, *palmata*, *affinis* and other species.

HAB f-10,9 :: B 5. **ABU** g10 s9 -2?

0592--*Viola pedata* L.

Violaceae: *Viola* <Pedata> *pedata*

This highly distinctive, open-pollinating polyploid ($2n = 56$) is widespread in eastern states. Several segregates have been described but none have been recognized in recent treatments. Included here is var. *lineariloba* DC., with records from BREC, MEAD and probably elsewhere. *V. pedata* is a very showy wildflower but has a reputation for being hard to cultivate except in acid soil with iron chelates, as recommended for most Ericaceae (Klaber 1976). In Ky. *pedata* is generally absent from uniformly rich calcareous soils, including all of the Bluegrass region. However, it often occurs at the upper fringes of calcareous glades in other regions, where the soil may be regularly leached and mixed with overlying chert, clay or sand.

HAB r-12,10 C 5. **ABU** g10 s9 -3.

0593--*Hybanthus concolor* (T.F. Forst.) Spreng.

Violaceae: *Hybanthus* (*Cubelium*) *concolor* This occurs widely in east-central states, but is generally restricted to woods on rocky base-rich soils. *H. concolor* may have only 1-2 close allies in Central America, together forming a narrowly circumscribed *Hybanthus* (*H. Ballard*, pers., comm. to W); $2n = 48$.

HAB 5,11 E 2. **ABU** g10 s10 -2.

0594--*Passiflora incarnata* L.

Passifloraceae: *Passiflora incarnata*

This widespread southeastern species generally occurs at field edges and along rights of way, and it is not clear what its original habitats were. It may have spread north after settlement. The earliest record in Ky. may be Gm in 1914, but he noted: "common plant in Kentucky, growing by waysides and along fences, wherever a strip is left without cultivation."

ALI s. **HAB** R-10 ::: D 6. **ABU** g10 s10 =?

0595--*Passiflora lutea* L. var. *glabriflora* Fern.

Passifloraceae: *Passiflora lutea* var. *glabriflora*

This glabrous variety is distributed largely in the Ohio and lower Mississippi Valleys. The typical variety has a more eastern and southeastern range; reports from Ky. are not verified (M).

HAB r-7,8,5 ::? D 3. **ABU** g9 s9 -2.

0596--*Populus deltoides* Bartr. ex Marsh.

Salicaceae: *Populus* <Aegeiros> *deltoides* (var. *d.*)

This variable species ranges widely across temperate regions of North America, but typical *deltoides* is restricted to the eastern half (FNA 7).

Included here as open dots are the unverified historical data of Gm and B. Although widely scattered over Ky., *deltoides* mostly occurs along larger rivers with much fresh alluvium deposited each year. Its small wind-blown seeds have allowed local establishment in modern cleared landscapes. But it was much less common in 1900-1910, when it formed a significant component of timber resources only on lowlands of the Shawnee Hills, and along the lower Ohio Rv. and the Mississippi Rv. (Gm, Barton 1919). Hybrids with *nigra* have been cultivated widely in eastern states (K, W), but escapes are unknown in Ky.

HAB 1 D 4. **ABU** g10 s10 -2.

0597--Populus nigra L. var. italica Du Roi C

Salicaceae: *Populus* <Aegeiros> *nigra* var. *italica*

This widely planted tree--the columnar "Lombardy poplar"--does deserve distinction from the typical European black poplar, though it is often treated just as a horticultural form. It can spread locally with suckers but seedlings are unknown; only male plants are known in Ky. (CW). Colls. that may suggest escaped status are known from NELS (Greenwell 1935), PIKE (CW) and OLDH (DHL), but the tree does not seem to become truly naturalized.

ALI EU.

0598--Populus heterophylla L.

Salicaceae: *Populus* <Leucoides> *heterophylla*

This is widely scattered across eastern states in disjunct areas: mostly on broad swampy bottomlands of the Coastal Plain, along the lower Ohio Rv., and south of the Great Lakes (Little 1971, PL). Further verification is needed in Ky. for some of the inland records.

HAB 3,6,9 ~? D? 4. **ABU** g9 s8 -3.

0599--Populus X jackii Sarg.

Salicaceae: *Populus* <Tacamahaca> cf. *balsamifera* x *deltoides* (*X jackii*, *X gileadensis*, "*candicans*")

This is a commonly grown cultivar of the widespread northern species, *P. balsamifera* L. It may be derived from hybridization with *deltoides* (Cr; W and citations; see also, Clark et al. 2005). The trees sucker from roots and may also establish occasionally from broken twigs, but do not produce seed; these plants are reportedly all female.

Most or all trees in Ky. appear to be the form known as *X gileadensis* Rouleau ("*Balm-of-Gilead*" or locally "*Bamagilly*"), which differs from

typical *X jackii* in its pubescent petioles (versus glabrous). However, that form probably does not deserve formal taxonomic recognition (W). The name *P. candicans* Ait. has also been applied to these plants, but may be synonymous with typical *balsamifera* (FNA 7). Typical *balsamifera* is rarely if ever planted in Ky., and it is not well-documented as native within southeastern states, even at higher elevations (W).

ALI N. **HAB** f-10 C 4. **ABU** +4.

0600--Populus grandidentata Michx.

Salicaceae: *Populus grandidentata*

This northeastern species may have increased in Ky. since settlement.

Included here as open dots are the historical data of Gm. It appears to have been uncommon even during 1910-1940 (Gm, B). There is a belief among some foresters that increase occurred during salvage of *Castanea dentata* after the chestnut blight. See note on potential hybrid under *alba*.

HAB 7,10,11 C 4. **ABU** g9 s9 +1?

0601--Populus tremuloides Michx. R

Salicaceae: *Populus tremuloides*

This is a widespread, variable northern tree that is known close to Ky. in se. Ind., se. Ohio and perhaps W.Va. (PL). There are some old obscure reports from Ky. (M), plus more recent reports from northeastern counties, but none are verified (Little 1971, Campbell et al. 1992). There may have been confusion with *grandidentata*. An apparent spontaneous hybrid of *tremuloides* and *grandidentata* occurs at the Boone County Arboretum (K. Stone, pers. comm.).

0602--Populus X canescens (Ait.) Sm. (pro sp.)

Salicaceae: *Populus alba* x *tremula* (*X canescens*)

This is a horticultural hybrid that can be aggressively persistent through root sprouts. Its status needs further study. It can be distinguished from *alba* by its leaves (Cr, W), which are less lobed on vigorous shoots (merely toothed versus 3-7-palmate), and less hairy when mature (glabrescent versus white-tomentose).

ALI EU. **HAB** f-10 D 4. **ABU** +4.

0603--Populus alba L.

Salicaceae: *Populus alba*

This has been widely planted in temperate regions of North America. It persists aggressively through root sprouts, but establishment from seed is not

documented in Ky. Distinction from *X canescens* deserves closer scrutiny. Also, hybridization with *grandidentata* can be expected, as it is well documented further north (FNA 7). Such hybrids lack the deeply 5-lobed "neofomed" leaves of *alba* on vigorous sprouts, and regular leaves are "irregularly and compoundly toothed."
ALI EU. **HAB** f-10 D 4. **ABU** +5.

0604--*Salix nigra* Marsh.

Salicaceae: *Salix* <*Salix*> *nigra*

This arborescent willow is widespread across temperate North America. In addition to its original swampy habitats, it has become widespread around artificial impoundments, along roadside ditches, and similar places. Its twigs easily break off, which can lead to local clonal spread.

HAB 2,3 ~ D 4. **ABU** g10 s10 +1.

0605--*Salix caroliniana* Michx.

Salicaceae: *Salix* <*Salix*> *caroliniana* (*wardii*)

This southeastern riparian willow occurs mostly on the western side of the Appalachians and Interior Low Plateaus, in the Ozark-Ouachita region, and on the south Atlantic Coastal Plain. In Ky. *caroliniana* is widespread along larger streams and rivers with scoured shrubby banks, but generally absent along smaller streams. It has the most strongly glaucous lower leaf surfaces among native willows of Ky., but see also notes under *eriocephala*, which can be confused.

HAB 1 C 4. **ABU** g9 s9 =.

0606--*Salix amygdaloides* Anderss.

Salicaceae: *Salix* <*Salix*> *amygdaloides*

This is widespread across central North America, and extends east into the Great Lakes area. The only Ky. record is a 1930s coll. of E.J. Palmer (#16502) from BALL (MO, US). Reports from central Ky. have been based on misidentifications of *alba* x *pentandra* (*X ehrhartiana* C. Mey.); see Argus (1986) and M for details.

HAB 1 E? 4. **ABU** g9 s1? -6?

0607--*Salix fragilis* L.

Salicaceae: *Salix* <*Salix*> *fragilis*

This originates from southeastern Europe, but has been widely planted in North America. The extent of naturalization in Ky. is not generally clear based on collection data. See also *alba* for records of hybrids.

ALI EU. **HAB** 1,2? C? 4. **ABU** +4.

0608--*Salix pentandra* L. C

Salicaceae: *Salix* <*Salix*> *pentandra*

This has been rarely planted in Ky., and there is little evidence of naturalization. There are only old colls. from KENT (NCU) and LYON (NY); both were verified by Argus (1986). However, the hybrid with *alba* (*X ehrhartiana*) does seem to be more established.

ALI EU. **HAB** 1,2? D? 4. **ABU** +4.

0609--*Salix X ehrhartiana* Sm. (pro sp.)

Salicaceae: *Salix* <*Salix*> *alba* x *pentandra* (*X ehrhartiana*)

This cultivar is locally frequent at a few sites, and it may be slowly spreading, at least through clonal means. It has been confused with *amygdaloides* and with other introduced taxa (Argus 1986).

ALI EU. **HAB** 1 D? 5. **ABU** +4.

0610--*Salix alba* L.

Salicaceae: *Salix* <*Salix*> *alba*

This arborescent willow is abundantly naturalized in some northeastern regions, but it remains much less common in southeastern states (PL). The earliest records in Ky. were by Pr (1893), Nelson (1919), Slack (1941) and B (1942). It is not clear if some records are from truly naturalized plants, but this species does seem to be spreading slowly along major rivers.

Several Ky. colls. have been determined as hybrids with *fragilis* (*X rubens* Schrank) by Argus (1986): from DAVI, HEND, FAYE, FRAN and MADI. A few colls. from FAYE, HENR (KY) and elsewhere (CW) appear to be hybrids with *babylonica* (*X sepulcralis* Simonkai); see also notes under *pentandra* (as *X ehrhartiana*). However, these Eurasian species of section *Salix* are mostly polyploids (with $2n = 76$), and do not hybridize with the natives in Ky. ($2n = 38$).

ALI EU. **HAB** 1 D 4. **ABU** +5*.

0611--*Salix babylonica* L.

Salicaceae: *Salix* <*Salix*> *babylonica*

This is a widely cultivated tree--the common "weeping willow"; some colls. may come from plantings. The mapping here is provisional. It is not clear if these records are from truly naturalized plants; see also *alba* for possible hybrids.

ALI AS. HAB 1 C? 4. ABU +4.

0612--Salix interior Rowlee

Salicaceae: Salix <Longifoliae> interior (exigua* var. sericans, longifolia)
There has been unsettled nomenclature within section Longifoliae. Plants in Ky. have sometimes been treated as the eastern segregate of a more widespread species: *S. exigua* Nutt. var. sericans (Nees) Nesom. Hybrids can be expected with other species, including *eriocephala*; such plants are largely sterile but potentially vigorous (FNA 7).

Some relatively short shrubby plants along smaller rocky streams in the Bluegrass region (with colls. from CAMP, HARR, FAYE, FRAN, JEFF, OWEN and elsewhere) have relatively narrow, somewhat persistently sericeous, deeper bluish-green leaves. They root much less readily from cuttings, compared to interior. These have been referred to as var. wheeleri Rowlee, but that largely midwestern taxon has not been generally recognized (F, Argus 1986, FNA 7). Further investigation of these Ky. plants is warranted.

HAB 1 D 4. ABU g10 s10 =.

0613--Salix eriocephala Michx.

Salicaceae: Salix <Vetrix> eriocephala (var. e.; rigida, "cordata")
In its broad definition, this is a widespread variable, hybridizing species of eastern and central North America, known from several types of habitat (Dorn 1995; FNA 8, W). Its nomenclature has been confused. Plants in eastern U.S.A. and adjacent Canada are referable to var. eriocephala, including *S. rigida* (Muhl.) Andersson (but not including *S. cordata* Muhl. non Michx.). In Ky. it mostly occurs on cobble bars along medium-sized streambanks, especially streams lined with calcareous rocks in the northern Bluegrass region.

S. eriocephala is closely related to *sericea* and hybrids are expected, as exemplified by a coll. from MENI (DHL see Argus 1986); see notes on diagnostic characters in FNA 7. However, habitats do not usually overlap in Ky. The leaves of *eriocephala* are similar to those of *caroliniana* in their generally glaucous lower surfaces, but can usually be distinguished by their longer petioles (ca. 5-14 mm versus 3-7 mm), which lack glandular dots or processes at summit (as present in *caroliniana*); and by their well-developed stipules, which are semi-ovate to subreniform and acutish (versus broadly

reniform and obtuse). Also, buds and twigs are distinctly reddish (versus more yellowish).

HAB 1 E? 4. ABU g9 s6 -1.

0614--Salix sericea Marsh.

Salicaceae: Salix <Vetrix> sericea ("petiolaris")
This is widely distributed over northeastern states, mostly growing on streambanks with relatively acid infertile soils. Though currently unknown in the Bluegrass, old records from this region (FAYE, FRAN) are confirmed; see also Argus (1986) and CW. However, the coll. recorded by Argus from MCLE (DHL) has not been relocated. In some early literature from Ky., the name *S. petiolaris* Sm. (a closely related northern species) was apparently used for *sericea*, but there was probably also confusion with *eriocephala* and even *caroliniana*.

HAB 1 B 4. ABU g9 s9 -2.

0615--Salix humilis Marsh.

Salicaceae: Salix <Vetrix> humilis (var. h.)
This small "upland" or "prairie" willow is a widespread variable eastern species, reportedly including tetraploids ($2n = 76$) as well as diploids (Argus 1986, PL). It is often confused with *occidentalis*; see notes under that name. Also, early records of the more northern species, *S. candida* Fluegge (Defries 1884; Pr, Gm), may well have been based on misidentifications of *humilis* (M).

In Ky. both *humilis* and *occidentalis* appear to have been formerly abundant in brushy transitions from woodland to native grassland, often in association with species like *Corylus americana* on drier sites or *Spiraea tomentosa* on damper sites. These willows were "a conspicuous feature in the Barrens" and (Michaux 1793-96; Short & Peter 1835, p. 338 as "conifera" and "longirostris"). *S. humilis* has remained relatively common in rougher woodland edges, old fields and fencerows at some localities, but it is not particularly weedy.

HAB f-10,8 C 5. ABU g9 s9 -4.

0616--Salix occidentalis Walt.

Salicaceae: Salix <Vetrix> occidentalis (tristis, humilis var. microphylla)
This is widespread across eastern states, but most common in the central Appalachians, and rare to absent on the Coastal Plain (Argus 1986, PL). It is generally distinct from typical *humilis*, but some colls. are difficult to

determine and variety status may be preferred. In Ky. it is less extensive and less weedy, being largely restricted to infertile acid soils.

HAB f-9,10,8 B? 5. **ABU** g8 s8 -4.

0617--Salix discolor Muhl.

Salicaceae: Salix <Vetrix> discolor

This northern "pussy willow" does not extend into the southern Appalachians (W). It is rare in Ky., and it cannot be relocated at some localities. Colls. reported by B from Appalachian regions were not mapped by Argus (1986) and need to be checked (perhaps at GH or US). *S. discolor* is variable, with a polyploid series (2n = 76, 95, 114), and can form fertile hybrids with *humilis* (2n = 38, 76). All other species of section *Vetrix* in Ky. may just have 2n = 38 (Cr; FNA 7).

HAB 2? D? 4. **ABU** g10 s2 -2?

0618--Salix cinerea L.

Salicaceae: Salix <Vetrix> cinerea

This alien is sometimes grown for ornamental use as a "pussy willow" by florists. Most of the records mapped here may not be from truly naturalized plants. The coll. from HICK (MUR) is from a spontaneous plant, identified as *ssp. oleifera* (Sm.) Macreight by Clark et al. (2005). *S. cinerea* can be difficult to distinguish from *discolor*; see FNA 7 for details.

ALI EU. **HAB** 1,2? C? 4. **ABU** +4.

0619--Salix purpurea L. C

Salicaceae: Salix <Vetrix> purpurea

This is naturalized across northeastern regions, but it is rare to absent in southeastern states (Argus 1986; PL). It is not clear if this species is truly naturalized in Ky. A tree formerly grew by the branch of Jessamine Creek below Wilmore in JESS (KY), and the species was reported from BOON by Nelson (1919).

ALI EU. **HAB** 1 E? 4. **ABU** +4.

0620--Phyllanthus caroliniensis Walt.

Phyllanthaceae [Euphorbiaceae*]: Phyllanthus <Loxopodium> caroliniensis

This is a widespread annual from southeastern states to South America.

ALI s. **HAB** f-10,9,7,6 ::: C 4. **ABU** g10 s9 -1?

0621--Phyllanthus urinaria L. C

Phyllanthaceae [Euphorbiaceae*]: Phyllanthus <Urinaria> urinaria

This tropical weed has become widely scattered across southeastern states, especially on nitrogen-rich soil in warmer areas (W). It has been found in greenhouses at the Univ. of Ky. in FAYE (JC for KY), but is unknown in the wild. Another expected weed of greenhouses is *P. tenellus* Roxb. (in subgenus *Kirganelia*), originally from the Mascarene Islands in the Indian Ocean, but now spread through many warmer regions of the world, including southeastern states (W).

ALI AS.

0622--Croton capitatus Michx.

Euphorbiaceae <Crotonoideae>: Croton <Pilinophytum> capitatus (var. c.)

This species is centered in south-central states and may have been native in Ky., at least in western regions. It has now become a common weed, especially in rocky overgrazed pastures. The first record was by Rafinesque (1825; as "Heptallon capitatum"). See notes under *lindheimeri*, which is closely related.

ALI w. **HAB** G-10 ::: D 6. **ABU** g10 s9? -1?

0623--Croton lindheimeri (Engelm. & Gray) Engelm. & Gray ex Wood

T

Euphorbiaceae <Crotonoideae>: Croton <Pilinophytum> lindheimeri

(engelmannii; capitatus var. l.)

This occurs mostly from Texas to the lower Mississippi Valley, and probably extends in Ky. (Y). It has been combined with *capitatus* as a variety by some authors, differing in its more robust habit, more tapered leaves with pointed apices, relatively short petioles of upper leaves, and more elongated seeds with rougher surface; see Y for details. There are reports of colls. from CARL (R. Athey #694 at MEM) and CHRI (Johnston 1958), but these have not been verified.

ALI w. **HAB** G-10? ::: D? 6. **ABU** g9 s2? -3?

0624--Croton monanthogynus Michx.

Euphorbiaceae <Crotonoideae>: Croton <Gynamblosis> monanthogynus

This is widespread in the southern Great Plains and southeastern states, with some adventive spread to north and east.

HAB r-12,10 +:: E 5. **ABU** g10 s9 -1?

0625--Croton glandulosus L. var. septentrionalis Muell.-Arg.

Euphorbiaceae <Crotonoideae>: Croton <Geiseleria> glandulosus var. septentrionalis

This taxon is widespread in the southern Great Plains and southeastern states, probably with much adventive spread to north and east. Typical glandulosus is more southern, in Central and South America.

ALI s. **HAB** F-10 :: C 6. **ABU** g10 s8? -1?

0626--Croton willdenowii G.L. Webster

Euphorbiaceae <Crotonoideae>: Croton <Crotonopsis> willdenowii (Cs. elliptica)

This is a widespread southeastern annual of bare, dry infertile soils. Some western colls. have been misidentified as the more southern species *C. michauxii* G.L. Webster (= *Crotonopsis linearis* Michx.). That species has been reported north to se. Mo, s. Ill., Ky. and Va. (F, St, M, J), but revision is needed; it has not been verified from Ky., Va. or N.C. (W). *C. linearis* differs in its less branched habit (branches monopodial versus dichotomous or trichotomous); the stellate hairs on upper leaf surfaces have relatively short, non-overlapping arms up to 0.3 mm long (versus overlapping, up to 1 mm); scales on fruits have a minute central axis with long, often ascending arms (versus broad central disk with short appressed arms).

HAB f-12,10 +:: B 5. **ABU** g10 s7 -2.

0627--Cnidioscolus stimulosus (Michx.) Engelm. & Gray W

Euphorbiaceae <Crotonoideae>: Cnidioscolus stimulosus

This stinging perennial occurs mostly on sandy soils of the southeastern Coastal Plain. The only Ky. record is a coll. from a railroad track in HARD (Cranfill 1991).

ALI S.

0628--Acalypha deamii (Weatherby) Ahles

Euphorbiaceae <Acalyphoideae>: Acalypha deamii (rhomboidea var. d.)

This is known from scattered localities in east-central states from Ark. and Mo. to Pa. and Va., especially in the Ohio Valley (G. Levin, pers. comm.). It is probably more widespread than records indicate, but generally restricted to disturbed ground in damp fertile woodland, especially on levees near larger streams and rivers, rarely along smaller streams and low slopes across calcareous landscapes. It is easily confused with typical rhomboidea, and there may be occasional intermediates.

A. deamii is diagnosed by its fruits, which have two seeds ca. 2-3 mm long (versus three seeds ca. 1-2 mm long). Vegetative differences may not be clear cut (F, Y; Levin 1999b, Becus 2003): leaf blades are usually bright green

(versus often reddish/coppery); mid-cauline ones usually have broader shape (l/w ca. 1.3-1.8 versus 1.8-2.6), with bases often truncate (versus just cuneate).

HAB 4 :: D 2. **ABU** g7? s7? -3.

0629--Acalypha rhomboidea Raf.

Euphorbiaceae <Acalyphoideae>: Acalypha rhomboidea (virginica var. r.)

This widespread eastern species is the most common species of the genus in Ky. There is an ecological series of related species from mesic to xeric sites: deamii, rhomboidea, virginica, gracilens, monococca. All of these may be distinct species, but further revision is needed (Y).

HAB h-10,7 :: D 6. **ABU** g10 s10 +1?

0630--Acalypha virginica L.

Euphorbiaceae <Acalyphoideae>: Acalypha virginica (var. v.; digyneia)

This is widespread in east-central states. Some colls. suggest hybridization with rhomboidea or gracilens, but there has been no proof here or elsewhere that virginica forms hybrids (Y).

HAB h-10,12,7 :: C 6. **ABU** g10 s10 +1?

0631--Acalypha gracilens Gray

Euphorbiaceae <Acalyphoideae>: Acalypha gracilens (var. g.)

This widespread eastern species is close to virginica and monococca, appearing somewhat intermediate, but all three taxa appear to be distinct species (Y).

HAB r-12,10 +:: C 6. **ABU** g10 s8 -1?

0632--Acalypha monococca (Engelm. ex Gray) L. Mill. & Gandhi T

Euphorbiaceae <Acalyphoideae>: Acalypha monococca (gracilens var. m.)

This is a largely Ozarkian species known from adjacent se. Mo. and s. Ill. (Levin 1999a,b). Records from Ky. are at least partly based on misidentifications, but further study of material filed under gracilens is desirable (M).

0633--Acalypha ostryifolia Riddell

Euphorbiaceae <Acalyphoideae>: Acalypha ostryifolia

This is widespread across southeastern states but largely restricted to calcareous or other base-rich soils. Original habitats are not clear, but it has become locally abundant in roadsides, crop fields, gardens and similar sites with regularly disturbed soil. It may have increased much since settlement; the first records from Ky. were in the 1880s (Linney 1882; Pr).

HAB R-10 ::: E 6. **ABU** g9 s9 +2?

0634--Ricinus communis L. C

Euphorbiaceae <Acalyphoideae>: *Ricinus communis*

This tall annual with toxic seeds ("castor bean") has been widely cultivated since the 1800s (Gm), for ornament, medicine or poison. It often reseeds itself into gardens or nearby, but does not persist or spread into the wild.

ALI AF.

0635--Tragia cordata Michx.

Euphorbiaceae <Acalyphoideae>: *Tragia cordata*

This twining, stinging perennial is centered in calcareous regions of the central and lower Mississippi Valley, but uncommon to absent east of the Mississippi Rv. It is scattered across w. and c. Ky., usually in thin dry woods and edges, but it is relatively inconspicuous and rarely noted in large numbers.

HAB 11,7,10 ::? E 3. **ABU** g9 s7 -3.

0636--Tragia betonicifolia Nutt.

Euphorbiaceae <Acalyphoideae>: *Tragia betonicifolia* (*urticifolia* var. *texana*)

In Ky. and elsewhere, this widespread southwestern species of calcareous soils has been confused with typical *urticifolia*, which is more southeastern and sometimes reported from more acid soils (but see W). In Ky. *betonicifolia* is verified only from one locality: on open limestone clifftops in PULA (KY), along the South Fork Cumberland Rv. (Palmer-Ball et al. 1988).

Most colls. named *urticifolia* from Mo. and Tenn. have also been redetermined as *betonicifolia* (St, p. 1727; Y; D. Estes, pers. comm.). According to Correll & Johnson (1970), *betonicifolia* has staminate pedicels with the persistent basal length only 0.3-0.6 mm, shorter than bracts (versus 1-1.8 mm, at least as long as bracts); also, stigmatic surfaces are less papillate and styles are less connate.

HAB 12 +\ E 4. **ABU** g10 s2 -2?

0637--Stillingia sylvatica Garden ex L. R

Euphorbiaceae <Euphorbioideae>: *Stillingia sylvatica*

This is widespread in dry sandy woodlands across southern states, but unknown in the central Mississippi and Ohio Valleys. Rafinesque (1833) reported a "*Stillingia montana*" from Ky., and Short (1840) reported "*Stillingia sylvatica*, rare--barrens of Kentucky." No colls. have been located to link with these mysterious reports. It is possible that those well-versed

botanists were referring to some other species in Euphorbiaceae, but there are no clear candidates.

ALI s.

0638--Euphorbia obtusata Pursh

Euphorbiaceae <Euphorbioideae>: *Euphorbia* <Esula> *obtusata*

This annual is known from across southeast-central states, generally in thin woods on fertile bottomlands and adjacent uplands, but it appears to have declined greatly and is generally rare (W; NS). It is virtually unknown to current botanists in Ky.

Some recent treatments and listings (e.g. K, Ch) have combined *E. obtusata* with *E. spathulata* Lam., a widespread western species that has smaller seeds (1.5-1.8 mm long versus 2-2.5 mm) with a distinctly alveolate surface (versus smooth or obscurely reticulate). *E. spathulata* is unknown in Ky. but may be expected across eastern states as an adventive; see also the European relative, *E. helioscopia* L. (Cr, W). Another related species is the more robust perennial, *E. purpurea* (Raf.) Fern., which is a globally rare species known from disjunct localities in or near the central Appalachians (including Adams Co., Ohio), and may be expected in Ky. (PL).

HAB 6,4,9? D 3. **ABU** g7? s3? -4?

0639--Euphorbia commutata Engelm.

Euphorbiaceae <Euphorbioideae>: *Euphorbia* <Esula> *commutata*

This perennial (perhaps short-lived) is widespread in eastern states, usually in woods on somewhat mesic, base-rich soil. The southern var. *erecta* Norton has been reported from Ky. (Cr), but verified colls. have not been located. That taxon has leaves all oblanceolate (versus oblanceolate to, in upper leaves, ovate) and longer-petioled (5-12 mm versus more or less sessile, especially the upper leaves).

HAB 5,11,7 ::? D 2. **ABU** g10 s9 -2.

0640--Euphorbia peplus L. W

Euphorbiaceae <Euphorbioideae>: *Euphorbia* <Esula> *peplus*

This annual is widely scattered in eastern states, but does not seem to be increasing much in Ky. or elsewhere in the southeast (W). Our only record is an apparent waif in MADI (EKY): J.S. Lassetter #348, 25 Aug 1979, ravine behind parking lot on ECU Campus.

ALI EU. **HAB** 10 ::: C? 6. **ABU** +4.

0641--*Euphorbia falcata* L.

Euphorbiaceae <Euphorbioideae>: *Euphorbia* <Esula> *falcata*
This annual weed from southern Europe is apparently spreading west from mid-Atlantic states (Cr, W). In Ky. it was first reported by Cranfill & Thieret (1981).

ALI EU. **HAB** 10 ::: E? 6. **ABU** +4.

0642--*Euphorbia cyparissias* L.

Euphorbiaceae <Euphorbioideae>: *Euphorbia* <Esula> *cyparissias*
This perennial has been widely grown for ornament, and it is now widely established across northern states, especially in disturbed ground.

ALI EU. **HAB** H-10? ::? C 5? **ABU** +4.

0643--*Euphorbia dentata* Michx.

Euphorbiaceae <Euphorbioideae>: *Euphorbia* <Poinsettia> *dentata* (var. d.)
This is a widespread annual from the Great Plains that is adventive in eastern states, especially along rights-of-way. See notes under the closely related *dauidii*.

ALI W. **HAB** R-10,12 ::: D 6. **ABU** +6.

0644--*Euphorbia davidii* Subils

Euphorbiaceae <Euphorbioideae>: *Euphorbia* <Poinsettia> *davidii* (*dentata* var. *gracillima*)
This is closely related to *dentata*, but tetraploid ($2n = 56$, versus 28 as in most native *Euphorbias*) and not readily forming hybrids. Its lower leaf surfaces are more hispid pubescent; its seeds are more angled and more coarsely wrinkled-warty (see Y for a detailed key based on M.H. Mayfield (1997, Ph.D., Univ of Tex.). It has recently been resurrected as a species, but most previous manuals have not recognized it, even as *E. dentata* var. *gracillima* Millsp. It reportedly has a more northern range, but with much overlap. Data mapped here for Ky. are from PL (citing Mayfield).

ALI W. **HAB** R-10,12 ::: D 6. **ABU** +6.

0645--*Euphorbia cyathophora* Murr.

Euphorbiaceae <Euphorbioideae>: *Euphorbia* <Poinsettia> *cyathophora* (*heterophylla* var. *graminifolia*)
This tall, variable annual from warmer American regions is widely cultivated for ornament (as "fire-on-the-mountain") and escaped across southeastern states. Almost all records of *E. heterophylla* L. from eastern North America probably belong here (Cr, W).

ALI S. **HAB** H-10,7? ::? C? 4? **ABU** +4.

0646--*Euphorbia pubentissima* Michx. R

Euphorbiaceae <Euphorbioideae>: *Euphorbia* <Agaloma> *pubentissima* (*corollata* var. *zinniiflora/paniculata/mollis*)
This is a southeastern taxon that may occur in Ky. (F), but verified colls. are unknown. Based on W (and other cited sources), *pubentissima* differs from typical *corollata* in its generally less robust habit (in several dimensions); its usually reflexed leaves (versus ascending); its earlier flowering (Mar-Jul versus Jun-Sep); and perhaps its explosive seed dispersal (pers. obs.). There were reports suggesting *pubentissima*, under the synonym *E. corollata* var. *zinniifolia* (Small) Ahles, from rocky banks of the Cumberland Rv. in a 1980 inventory (M). Also, typical *pubentissima* has been collected from banks of the Obed Rv. in ne. Tenn. (TENN; D. Estes, pers. comm.).

0647--*Euphorbia corollata* L.

Euphorbiaceae <Euphorbioideae>: *Euphorbia* <Agaloma> *corollata* (var. c.)
This is a widespread eastern species, but uncommon to absent on the southeastern Coastal Plain, where largely replaced by *pubentissima*; see notes under that name. Plants known previously as *E. corollata* var. *mollis* Millsp., based on their hairiness, are frequent but may not be worth recognizing. The epithet *mollis* may have been misapplied anyway; it has been listed as a synonym of *pubentissima* (see Y, W and their citations). Typical *corollata* and *pubentissima* both have hairy forms as well as glabrous.

HAB f-10,12,7 C 4. **ABU** g10 s10 -2?

0648--*Euphorbia mercurialina* Michx.

Euphorbiaceae <Euphorbioideae>: *Euphorbia* <Agaloma> *mercurialina*
This is known mostly from relatively base-rich soils in or near the southern Cumberland Plateau in Ky., Tenn., Ga. and Ala. Plants in the Piedmont of N.C. and Va. are disjunct or adventive (W). In Ky. plants are generally found on low wooded slopes, especially along trails or roads. *E. mercurialina* is close to *E. ipecacuanhae* L. of the south Atlantic Coastal Plain, which was erroneously reported from Ky. by McFarland (1942).

HAB 7,5,11 :: D 3. **ABU** g6 s4 -1.

0649--*Euphorbia marginata* Pursh

Euphorbiaceae <Euphorbioideae>: *Euphorbia* <Agaloma> *marginata*
This tall annual polyploid ($2n = 56$) from the Great Plains has had widespread ornamental use (as "snow-on-the-mountain") for over a century (Pr), but there

has not been much naturalization far from residences. In 1914, Gm noted: "Some years ago large tracts of it were observed by me along the Ohio River at Hawesville" [HANC].

ALI W. **HAB** H-10 ::? C 6? **ABU** +5?

0650--Chamaesyce nutans (Lag.) Small

Euphorbiaceae <Euphorbioideae>: Chamaesyce [Euphorbia*] nutans (preslii; "maculata"; "hypericifolia")

This widespread, variable eastern weed was formerly misnamed maculata by F and others, due to confusion in nomenclature. In addition to several diagnostic differences from other Chamaesyce species in eastern North America (from leaves to seeds), nutans is usually a much larger plant, with ascending stems up to 8-10 dm long (versus mostly prostrate) and leaves 8-35 mm long (versus mostly 5-15 mm); plants are glabrous except for hairs up to 0.3 mm long on young stem surfaces; 2n = 12, 14, 22 (F, Cr, Y). Both nutans and maculata often have dark reddish/purplish "maculate" marks on leaves:

HAB R-10,1 :::: D 6. **ABU** g10 s10 +3.

0651--Chamaesyce vermiculata (Raf.) House R

Euphorbiaceae <Euphorbioideae>: Chamaesyce [Euphorbia*] vermiculata
This northeastern species may well occur in Ky. (see PL), but provisional records from BOYL (MM) and JESS (JC) have not been confirmed. It resembles nutans in several characters, but plants are generally smaller and more hairy, with more sharply angled seeds (F, Cr).

0652--Chamaesyce prostrata (Ait.) Small

Euphorbiaceae <Euphorbioideae>: Chamaesyce [Euphorbia*] prostrata (E. "chamaesyce")

This may have originated in more tropical American regions, and probably spread into southeastern states after settlement (Cr, W). The earliest Ky. records are 1930s colls. of B (M). It is probably much more widespread than the map here indicates. Distinction from maculata is based primarily on its shorter styles, spreading-villous fruits, and more sharply angled seeds; leaves tend to be smaller and more variable in shape, often purple at margins but lacking maculate spots; 2n = 18, 20 (Y, W).

ALI S. **HAB** S-10 :::: D 6. **ABU** +4.

0653--Chamaesyce maculata (L.) Small

Euphorbiaceae <Euphorbioideae>: Chamaesyce [Euphorbia*] maculata (supina)

This was originally native to eastern and central North America, but now a cosmopolitan weed. It often forms mats in roadbeds or other trampled or driven areas. See Y and notes here under other species in the genus, which are often confused; 2n = 28. Leaves are relatively dark green, often with a dark reddish spot.

HAB S-10 :::: D 6. **ABU** g10 s10 +3.

0654--Chamaesyce humistrata (Engelm.) Small

Euphorbiaceae <Euphorbioideae>: Chamaesyce [Euphorbia*] humistrata
This apparently originated in the Mississippi Valley, especially in open riparian vegetation (Cr, W). It may have spread across Ky. after settlement; the earliest records are 1930s colls. of B (M). It is probably much more widespread than the map here indicates. It is close to maculata and distinction can be difficult even with flowers (Y); leaves are usually broader in shape (l/w ca. 1.5-2 versus 2-3) and relatively pale green without dark spots; stems often root at nodes (unlike maculata).

ALI w. **HAB** S-10,9,1 :::: D 6. **ABU** g9 s7? +2?

0655--Chamaesyce serpens (HBK.) Small R

Euphorbiaceae <Euphorbioideae>: Chamaesyce [Euphorbia*] serpens
This occurs mostly from the Great Plains to Central America. It has been reported from CRIT (KSNPC; check EKY) and WARR (Pr), but verified colls. have not been seen. It is widely scattered on fertile bottomlands along larger rivers in Mo. (Y) and most other states adjacent to Ky. (PL). C. serpens has been confused with maculata and other species, but it is completely glabrous, with small (2-7 mm long), oblong to suborbicular, entire, often reddish-margined leaves and fused scalelike stipules; 2n = 22 (Y).

Two related western species may also be expected as adventives in Ky. (W) and have been reported, but apparently in error (M): C. serpyllifolia (Pers.) Small and C. glyptosperma (Engelm.) Small.

ALI W.

0656--Tribulus terrestris L.

Zygophyllaceae: Tribulus terrestris

This annual weed with spiny fruit originates from southern Europe, and is now widely scattered across western states, but less frequent in the southeast.

ALI EU. **HAB** R-10,1? :::: C 6. **ABU** +4.

0657--Rhodotypos scandens (Thunb.) Makino

Rosaceae <Spiraeaceae>: *Rhodotypos scandens*

This ornamental shrub has escaped locally from plantings in the Louisville area (M), Bernhiem Forest and elsewhere (CW), and may gradually increase. In New England and N.Y. it is becoming a problem, and appears resistant to deer browsing (T. Rawinski, pers. comm.).

ALI AS. HAB 8,7? C? 4? ABU +4.

0658--*Physocarpus opulifolius* (L.) Maxim.

Rosaceae <Spiraeaceae>: *Physocarpus opulifolius* (with intermedius)

This is a widespread northeastern species with variation that needs further study. It mostly occurs in two distinct habitats: calcareous cliffs (especially to the west), and on sandstone boulders along Appalachian rivers. Var. *intermedius* (Rydb.) B.L. Robins. has distinctly stellate-pubescent fruits (follicles), and may deserve species status (FNA, in prep.). It has a largely midwestern range, was recently been found in w. Tenn. (D. Estes, pers. comm.), and probably occurs in Ky.

HAB 12,1 D 4. ABU g9 s8 -1.

0659--*Kerria japonica* (L.) DC. C

Rosaceae <Spiraeaceae>: *Kerria japonica*

This cultivated shrub with orange-yellow flowers occasionally escapes by seed in eastern states, but it is not yet clear if the species becoming a significant invasive problem. In Ky. it has been recently recorded from CUMB, HARL, MADI and MENI (Abbott et al. 2004; CW).

ALI AS. HAB 8,7? C? 4?

0660--*Spiraea prunifolia* Sieb. & Zucc.

Rosaceae <Spiraeaceae>: *Spiraea prunifolia*

There are several records of this cultivated species from relatively wild contexts, but most or all may be from persistent plants at old home sites rather than self-seedings. Some related species of *Spiraea* are also cultivated, including *S. thunbergii* Siebold and *S. chamaedryifolia* L.; see also *S. X vanhouttei*.

ALI AS. HAB 8,7? C? 4? ABU +4.

0661--*Spiraea X vanhouttei* (Briot) Carr. C

Rosaceae <Spiraeaceae>: *Spiraea X vanhouttei* (*cantoniensis* x *trilobata*)

Wilder records of this commonly cultivated hybrid (usually known as "bridal wreath") appear to be just from persistent plants at old home sites; it has been collected from OLDH (DHL).

ALI AS.

0662--*Spiraea virginiana* Britt.

Rosaceae <Spiraeaceae>: *Spiraea virginiana*

This riparian shrub is restricted to southern Appalachian regions or adjacent hills, with several disjunct populations in different watersheds. More colls. are needed for herbaria and arboreta. Plants in Ky. and Ohio appear to become larger and less compact than some further south on the Cumberland Plateau. *S. virginiana* has sometimes been confused with *S. corymbosa* Raf., which is a smaller shrub largely restricted to rocky woods of the Blue Ridge or nearby (Ogle 1991; K, M, W).

HAB 1 C 4. ABU g4 s3 -1.

0663--*Spiraea japonica* L. f. var. *fortunei* (Planch.) Rehd.

Rosaceae <Spiraeaceae>: *Spiraea japonica*

This widely cultivated shrub is now common in the woods of some Appalachian regions. First collected from Ky. in the 1930s (B), it is now locally abundant, especially along trails and woodland edges on low slopes and floodplains. It is more common than indicated by the records mapped here. Virtually all escaped plants of *japonica* in eastern North America are referable to var. *fortunei* (Planch.) Rehd.

ALI AS. HAB 8,4,7 C 3. ABU +5*.

0664--*Spiraea tomentosa* L.

Rosaceae <Spiraeaceae>: *Spiraea tomentosa*

This small shrub is widespread across northeastern regions, but largely restricted to open brushy areas on wet acid soils. In Ky. all plants match var. *rosea* (Raf.) Fern., a more western segregate with less dense inflorescences (Cr), but this has not been generally recognized in recent treatments (W).

HAB 9 B 5. ABU g9 s8 -3.

0665--*Spiraea salicifolia* L. C

Rosaceae <Spiraeaceae>: *Spiraea salicifolia*

Although this is widely cultivated across eastern states, it has rarely been reported from a wild context, and then mostly in cooler zones (PL, W). It has been reported from MARS (BA) and perhaps elsewhere (as cited by M), but there is no clear evidence of true naturalization in Ky.

ALI EU.

0666--*Spiraea alba* Du Roi

Rosaceae <Spiraeaceae>: *Spiraea alba* (var. a.)

This northern species has been found at only two native sites, near opposite extremes of the state: (1) a swampy meadow in BALL (coll. of R. Athey to check at MEM), where it cannot be relocated; (2) a rocky riverbank seep in PIKE (KY), where a small piece has been taken for cultivation by JC. These plant are typical *alba*, not var. *latifolia* (Ait.) Dippel, a more eastern segregate that may deserve species status (W).

HAB 1,2 C? 5. **ABU** g10 s2 -3?

0667--*Aruncus dioicus* (Walt.) Fern. var. *dioicus*

Rosaceae <Spiraeaceae>: *Aruncus dioicus* var. d.

This species is scattered widely across east-central states, from Appalachian to Ozarkian regions, but it is largely restricted to relatively undisturbed mesic woods. Typical *dioicus* may be absent west of the Shawnee Hills, but re-examination of colls. is desirable. There may be some intergradation with var. *pubescens* (Cr, W).

HAB 5,7 C 1. **ABU** g9 s9 -2.

0668--*Aruncus dioicus* (Walt.) Fern. var. *pubescens* (Rydb.) Fern.

Rosaceae <Spiraeaceae>: *Aruncus dioicus* var. *pubescens*

See notes under var. *dioicus*.

HAB 5,7 C 1. **ABU** g8 s4? -3.

0669--*Gillenia stipulata* (Muhl. ex Willd.) Nutt.

Rosaceae <Potentilleae>: *Gillenia* (*Porteranthus**) *stipulata*

This is widely scattered across east-central states, west of the high Appalachians, usually growing on medium acid soils. Controversy over the generic name has been resolved (W).

HAB 11,7,10 C 3. **ABU** g9 s9 -2.

0670--*Gillenia trifoliata* (L.) Moench

Rosaceae <Potentilleae>: *Gillenia* (*Porteranthus**) *trifoliata*

This is concentrated on strongly acid soils in Appalachian regions, but with outlying populations west to the Ozarks. In Ky. it only occurs in the Cumberland Mts. plus some extension west to the Cliff Section of MCRE and WHIT. There is almost no overlap in range with *stipulatus*.

HAB 10,7,11 B 4. **ABU** g9 s7 -2.

0671--*Waldsteinia fragarioides* (Michx.) Tratt.

Rosaceae <Potentilleae>: *Waldsteinia* [*Geum*] *fragarioides* (var. f.)

This has a rather fragmented range across northeastern states and adjacent Canada. It is rare in Ky., being largely restricted to limestone ravines of the central Green Rv. watershed, central Kentucky Rv. Palisades area, western Knobs and western escarpments of the Appalachian Plateaus.

Distinction from the largely Southern Appalachian taxon, *doniana*, is uncertain in some colls., but species status is probably justified (Robertson 1974; PL, W). *W. doniana* has smaller flowers, with petals 2.5-4 mm long (versus 4-10 mm) and sepals 1-1.5 mm long (versus 2-6 mm). Inclusion of *Waldsteinia* within *Geum* has gained support in recent years (FNA, in prep.); see W for alternative combinations.

HAB 5,11 D 2. **ABU** g8? s7 -1.

0672--*Waldsteinia doniana* Tratt.

Rosaceae <Potentilleae>: *Waldsteinia* [*Geum*] *doniana* (parviflora; *fragarioides* var. p./ssp. d.)

See notes under *fragarioides*. The degree of distinction deserves more study in Ky.

HAB 5 C? 2. **ABU** g7? s5? -2.

0673--*Geum vernum* (Raf.) Torr. & Gray

Rosaceae <Potentilleae>: *Geum* <*Stylipus*> *vernum*

This occurs mostly in east-central states from Iowa and Okl. to N.Y. and N.J. It flowers a month or so earlier than *canadense*, and is more concentrated on base-rich soils, but often in relatively open disturbed habitats.

HAB h-10,8,7 :: E 4. **ABU** g9 s9 -3.

0674--*Geum laciniatum* Murr.

Rosaceae <Potentilleae>: *Geum laciniatum*

This widespread northeastern species is largely restricted to wetlands. It is relatively robust and rough-hairy, with distinctively hirsute pedicels, and it often has more divided cauline leaves, compared to *canadense* and *virginianum*. But its white petals are moderately short (mostly 3-5 mm), and its receptacles are less hairy. Most plants in Ky. are referable to var. *trichocarpum* Fern., with bristly achenes. The somewhat more northern var. *laciniatum*, with glabrous achenes, has been collected in BRAC and LEWI (NCU), but it is not clear if these taxa are worth separating (W).

HAB 9,2 C? 5. **ABU** g9 s7 -4.

0675--*Geum canadense* Jacq.

Rosaceae <Potentilleae>: *Geum canadense*

This is a widespread eastern species, with variation that needs further study. Most material in Ky. is probably referable to the typical variety. Also, var. *grimesii* Fern. & Weatherby is recorded from LETC (B); var. *camporum* (Rydb.) Fern. & Weatherby is recorded from CALL (MUR); and forma *glandulosum* Fern. is recorded from FULT (KY).

HAB h-8,7,10 D 4. **ABU** g10 s10 -2.

0676--*Geum virginianum* L.

Rosaceae <Potentilleae>: *Geum virginianum*

This is centered in Appalachian regions or nearby, with western extensions into some hills of the Interior Low Plateaus. In Ky. it is widely scattered on poorer soils than *canadense* but often confused and overlooked. It differs in its small pale or greenish yellow petals (versus white), 2-4 x 1-2 mm long (versus 5-9 x 2-4.5 mm). Its largest stipules are mostly 1.5-5.5 x 1-1.5 cm (versus 1-2 x 0.5-1 cm) and coarsely toothed to lobed (versus subentire to toothed). Its leaves tend to be more coarsely toothed, with more obtuse tips, and are more abruptly reduced from base to summit. Lower stems and petioles are relatively long-hirsute (versus smooth to sparsely short-hirsute).

HAB 11,7,8 C? 3. **ABU** g8 s8 -1.

0677--*Duchesnea indica* (Andr.) Focke

Rosaceae <Potentilleae>: *Duchesnea* [*Potentilla*] *indica*

This is widely naturalized across southeastern states (K, SE). In Ky. it was first recorded by Linney (1882), and it was "common locally about Lexington in lawns" in 1914 (Gm). On damp fertile soils, *Duchesnea* has also become locally problematic within woodlands, especially along trails where *Trifolium stoloniferum* might be recovered. See W for notes on potential combination of *Duchesnea* (2n = 42, 84) within *Potentilla* (2n = 14-98 based on n = 7).

ALI AS. **HAB** h-7,8,4 :: D 3. **ABU** +5.

0678--*Potentilla simplex* Michx.

Rosaceae <Potentilleae>: *Potentilla simplex*

This is a widespread eastern species. Record mapped here include var. *argyrisma* Fern., which is recorded from several scattered counties but probably not worth recognizing (W).

HAB f-10,7,9 :: C 4. **ABU** g10 s10 -2?

0679--*Potentilla canadensis* L.

Rosaceae <Potentilleae>: *Potentilla canadensis*

This distinct northeastern species has often been confused with *simplex*, but there are differences in rhizomes, stolons, stems, leaves and branching patterns (F); leaves alone (Cr) should not be relied on. Virtually all plants are referable to var. *villosissima* Fern., which has a largely Appalachian (and perhaps Ozarkian) range. A coll. from the campus of Belknap University in JEFF (DHL) may be adventive; it appears to be the more northern var. *canadensis*.

HAB f-10,7,11 :: B 3. **ABU** g9 s9 -2.

0680--*Potentilla reptans* L.

Rosaceae <Potentilleae>: *Potentilla reptans*

This is scattered over northeastern regions, but unknown south of Ky. and Va. (W). See note under *anglica*, which may be confused; colls. deserve to be reviewed.

ALI EU. **HAB** F-9? :: D? 4? **ABU** +4.

0681--*Potentilla anglica* Laicharding R

Rosaceae <Potentilleae>: *Potentilla anglica* (*procumbens*)

This relatively large-flowered polyploid is close to *reptans* and has probably been confused (2n = 56 versus 28). A coll. from BREC (KY) has been identified as *anglica*, but cannot now be relocated.

ALI N? **HAB** F-10? C?

0682--*Potentilla recta* L.

Rosaceae <Potentilleae>: *Potentilla recta*

This polyploid (2n = 42) is widespread across eastern states, especially in dry old fields and roadsides.

ALI EU. **HAB** F-10 D 5. **ABU** +5.

0683--*Potentilla intermedia* L.

Rosaceae <Potentilleae>: *Potentilla intermedia*

This variable species (2n = 28, 42, 56) is scattered over east-central states (PL, W).

ALI EU. **HAB** F-10? :: C? 5? **ABU** +4.

0684--*Potentilla norvegica* L.

Rosaceae <Potentilleae>: *Potentilla norvegica* (?*monspeliensis*)

This variable species (2n = 42, 56, 70) is circumboreal and widespread across northern North America. Most or all material in Ky. may be var. *hirsuta*

(Michx.) Lehm. (= *P. monspeliensis* L.). It was recorded early after settlement (Short & Peter 1835), and may be native; see also Cr and M.

ALI m. **HAB** F-10,8 :: D 4. **ABU** +5?

0685--*Fragaria vesca* L. R

Rosaceae <Potentilleae>: *Fragaria vesca*

This diploid (2n = 14) occurs in Europe and, mostly as var. *americana* Porter, in northern North America. It is known from Ohio, W.Va. and Va., within 50 miles of Ky., and it extends south along the higher Appalachians to N.C. (W). But reports from Ky. have been erroneous or dubious (M).

0686--*Fragaria virginiana* Duchesne

Rosaceae <Potentilleae>: *Fragaria virginiana*

This is the widespread eastern strawberry, an octoploid (2n = 56). Segregates may not be well defined. *F. virginiana* is most common in medium acid soils, on moderately dry, sunny sites, and declines without regular trampling or rough mowing. In the central Bluegrass, Short (1828-9) noted: "...not a common plant in this vicinity: it does, however, occasionally occur in old fields and road sides... In the western part of the state it constitutes a principal feature in the vegetation of the barrens; where, in situations fully exposed to the influence of the sun, its fruit becomes matured to perfection, is darker-coloured and sweeter than the strawberry of the gardens." In the barrens of CHRI, Ross (1882, p. 213-215) recalled: "Here the wild strawberries grew in such profusion as to stain the horse's hoof a deep red color."

Plants known as var. *illinoensis* Gray predominate in Ky., but there is a need for more detailed analysis and review of potential nomenclature. F indicated that var. *virginiana* is more northern and tends to have shorter terminal leaflets (ca. 1.5-10 cm long versus 5-10 cm) with fewer teeth (4-8 pairs versus 8-15), and slightly shorter calyx lobes (4-8 mm long versus 5-10 mm). Colls. that match this description have been found mostly in Appalachian regions: BELL, CART, FLOY, LAUR (BEREA, KY); there may also be colls. from MCLE (KY) and WARR (DHL). The cultivated strawberry is a hybrid of *virginiana* and the South American *F. chiloensis* Duchesne; it does not persist in the wild (M).

HAB F-10,7 :: C 5. **ABU** g10 s10 -2?

0687--*Filipendula rubra* (Hill) B.L. Robins. R

Rosaceae <Potentilleae>: *Filipendula rubra*

This northeastern species was reported by Rafinesque and others (F, Cr), but no coll. has been definitely attributed to Ky. (M). There is a coll. by C.W. Short (NY), but the label is insufficient. The species does occur in s. Ohio, w. Va. and w. N.C. Before settlement, there may have been suitable habitat in the northern Bluegrass region of Ky.

0688--*Filipendula ulmaria* (L.) Maxim. C

Rosaceae <Potentilleae>: *Filipendula ulmaria*

This European species is sometimes cultivated and can spread near gardens. Our only record is a mapping in south-central Ky. by Hulten & Freis (1986); see also K.

ALI EU.

0689--*Rubus odoratus* L.

Rosaceae <Rubeae>: *Rubus* <Anaplobatus> *odoratus*

This is a distinct and relatively uniform northeastern species. It is locally common in the Cumberland Mts. of Ky. but rare further west. Some of the outlying colls. from FRAN (KY-Agr.), OLDH (DHL), MASO (M), MEAD (PH) and TAYL (KY) might be from escaped or cultivated plants, but the species is considered native in s. Ind. (D; M. Homoya, pers. comm.).

HAB 7,8,5 C 4. **ABU** g10 s7 -1.

0690--*Rubus phoenicolasius* Maxim.

Rosaceae <Rubeae>: *Rubus* <Idaeanthi> *phoenicolasius*

This East Asian species ("wineberry") is clearly spreading by seed across eastern states, especially in Appalachian and mid-Atlantic regions. In Ky. a few early records may come from persistent plantings, but the species is now much more widespread than colls. indicate.

ALI AS. **HAB** 7,8 C 4. **ABU** +5.

0691--*Rubus illecebrosus* Focke R

Rosaceae <Rubeae>: *Rubus* <Rosaeifoliae> *illecebrosus*

This cultivated Japanese species ("strawberry-raspberry") is locally naturalized in Appalachian regions (W), but not confirmed to be wild in Ky. M noted a coll. from LAWR (LY-Agr.), but its context is unknown, and the coll. now appears mislaid.

ALI AS.

0692--*Rubus idaeus* L. var. *idaeus* R

Rosaceae <Rubeae>: *Rubus* <Idaeanthi> *idaeus*

This northern (circumboreal) species includes the cultivated red raspberry (in var. *idaeus*). It was reported from Ky. by BA but no coll. has been located.
ALI EU.

0693--*Rubus occidentalis* L.

Rosaceae <Rubeae>: *Rubus* <Idaeanthi> *occidentalis*

This is widespread across eastern and central states; it often cultivated, and may hybridize with *idaeus*. Rare plants (e.g. at Griffith Woods, HARR) with pale yellowish to amber fruit (and often yellow-green versus purplish canes) are known as *forma pallidus* (Bailey) Robins.

HAB f-8,7,10 D 4. **ABU** g10 s10 -2?

0694--*Rubus armeniacus* Focke T

Rosaceae <Rubeae>: *Rubus* <Discolores> *armeniacus* (*procerus*, ?*bifrons*, "*discolor*")

This alien has been indicated for Ky. under various names (M; FNA in prep.), but its taxonomy has been confused; see also notes under cf. *serissimus*. *R. armeniacus* is a tetraploid ($2n = 28$) up to 5 m tall that has become one of the most popular cultivated blackberries in Europe and elsewhere; it has become a problematic weed in the Pacific Northwest. There are scattered records from Mo. to Va., generally in cooler zones than most of Ky. Though often named "*Himalaya-berry*" it appears to have originated from the Caucasus region, according to Weber (1995; see also A. Ceska in Botanical Electronic News No. 230, Aug. 25, 1999).

Other names used for this plant include *R. bifrons* Vest, *R. discolor* Wiehe & Nees and *R. procerus* P.J. Muell. L. Alice et al. (in prep. for FNA) have included *armeniacus* within *bifrons*, although the latter is generally regarded as a distinct polyploid ($2n = 48$) in Europe (Weber 1995). They indicate that *discolor* should be included within *R. ulmifolius* Schott, a closely related diploid from southern Europe that has become established in Cal. *R. ulmifolius* remains virtually unknown as a wild plant in eastern states, but it is reportedly involved in the parentage of several cultivars, including some widely distributed "thornless blackberries" that can persist in old abandoned gardens.

ALI EU.

0695--*Rubus serissimus* Bailey ?

Rosaceae <Rubeae>: *Rubus* <Discolores> cf. *serissimus* ("*bifrons*"*)

This plant appears has been generally misidentified as *R. bifrons* Vest in manuals; see also notes under *armeniacus* (Correll & Johnson 1970; Cr, RAB, St, W). The name *serissimus* is indicated for it by ongoing revision of M. Widrechner for the Flora of Missouri (G. Yatskievitch, pers. comm.), but treatment for FNA remains uncertain (L. Alice & D. Goldman, pers. comm.). The plant has become widely scattered in southeastern states during the past 50 years, often spreading along rights-of-way: "it can be quite aggressive, often forming impenetrable thickets" (FNA, in prep.). Flowers are pink (to various degrees); lower leaf surfaces have thin to dense gray-brown pubescence; primocane leaves mostly have only 3-4(5) leaflets, but often with lateral lobes; stems are erect at first but usually overarching, and sometimes trailing with rooting tips; plants are rarely more than 2 m tall.

This taxon may have originated from hybridization between an Eurasian plant in the *bifrons* group and a native plant in the *cuneifolius* group. In some characters, it resembles *R. cuneifolius* Pursh (Sm, W), which has been reported from Ky. (BA) but probably in error (M). *R. cuneifolius* has more bluntly obovate, coriaceous leaves, and stems more erect but usually under 1 m long; it is largely restricted to sandy soils on the Coastal Plain and Piedmont, east of the Mississippi Rv.

ALI e? **HAB** 10,8,9,6 D? 5. **ABU** g8? s6? +1?

0696--*Rubus laciniatus* R

Rosaceae <Rubeae>: *Rubus* <Sylvatici> *laciniatus*

This has been cultivated in North America but does not appear to be generally naturalized in eastern states. The few records from Ky. are somewhat obscure, and might just come from plantings (M).

ALI EU.

0697--*Rubus trivialis* Michx.

Rosaceae <Rubeae>: *Rubus* <Verotriviales> *trivialis*

This common southeastern species may be widely scattered on western lowlands in Ky., at least near the Mississippi Rv., but more colls. are needed to document its range. More northern records within the state have not been verified (Clark & Bauer 2001; CW), but the species has been recently confirmed in adjacent Hamilton Co., Ohio (D. Boone, pers. comm.).

HAB f-9,6,4? D? 5. **ABU** g9 s8 -1?

0698--*Rubus caesius* L. C

Rosaceae <Rubeae>: *Rubus* <Triviales> *caesius*

This is occasionally cultivated (as the European "dewberry") and it has spread locally in JEFF (M. Medley for WKY; G; Gunn 1968; Bailey 1943-45).
ALI EU.

0699--*Rubus enslenii* Tratt.

Rosaceae <Rubeae>: *Rubus* <Flagellares> *enslenii* (?connixus)
This widespread southeastern species needs better circumscription (F). The map includes a few records of the closely related glandular plants (perhaps transitional to the *invisus* group), *R. leviculus* Bailey and *R. scambens* Bailey (M). An additional coll. from CLARK (M. Medley & J. Thieret 10755-84 for WKY) is only a primocane, but differs from all other described species of the *Flagellares* in having obovate subentire leaflets. Some of the taxa currently included with *flagellaris* (especially *nefrens* and *steelei*) could be considered at least transitional to *enslenii*. This complex will be studied further when M. Medley's colls. are processed.

HAB f-10,7,11 C 5. **ABU** g9? s9? +1?

0700--*Rubus leviculus* Bailey ? T

Rosaceae <Rubeae>: *Rubus* <Flagellares> cf. *leviculus* (or *scambens*)
Colls. from CLAR (Widrechner 1998), HARD & LESL (M. Medley for WKY) have been referred to this taxon, following the treatments of Bailey (1943) and F. However, this species has previously been known only on or near the Piedmont of Ga., S.C., N.C. and Va. The only clear difference from *enslenii* may be its relatively hairy, often glandular, petioles and pedicels. Some colls. (e.g. from BATH at KY) have been referred to *R. scambens* Bailey, a closely related taxon from Va. to Mass. that differs from *leviculus* in its relatively broad leaflets and more robust canes. Further revision is needed to determine the degree of distinction in these taxa.

0701--*Rubus baileyanus* Britt.

Rosaceae <Rubeae>: *Rubus* <Flagellares> *baileyanus* (?*sailori*, *flagellaris* var. *humifusus*)
These plants differ from *enslenii* in their more robust, long-trailing floricanes (ca. 1-3 mm thick versus 2.5-5 mm) and stouter prickles (ca. 0.5-2 mm long versus 1.5-3 mm), suggesting a transition to *flagellaris*. There is no clear difference in habitat or range, but these distinct plants are mapped here pending further taxonomic evaluation. An alternative name may be *R. flagellaris* Willd. var. *humifusus* (Torr. & Gray) Boivin (K).

HAB f-10,7? C? 5. **ABU** g8? s8? -1?

0702--*Rubus flagellaris* Willd.

Rosaceae <Rubeae>: *Rubus* <Flagellares> *flagellaris* (*fecundus*, *vixalacer*, *felix*, *nefrens*, *celer*, ?*steelei*)

This widespread northeastern species may intergrade with *enslenii* (F). *R. flagellaris* and its close allies differ from the *enslenii* group in their generally thicker canes (ca. 3-6 mm at base versus 2-4 mm), leaves usually firmer, those of primocanes 3- or 5-foliolate (versus just 3), the leaflets usually ovate (versus ovate to elliptic), more abruptly acuminate and rounded at base (versus cuneate); flowers are usually in groups of 2-9 (versus solitary or sometimes 2-3).

Mapped records here include the closely related taxa, *R. fecundus* Bailey, *R. vixalacer* Bailey, *R. felix* Bailey, *R. nefrens* Bailey, *R. celer* Bailey and perhaps *R. steelei* Bailey. See also notes under *R. aboriginum*. Some additional colls. from these same mapped counties are referable to *R. meracus* Bailey (CAMP, CARL, LEWI) or *R. mundus* Bailey (BULL, MCRE, POWE). The latter two taxa are more hairy than typical *R. flagellaris* and may be considered transitions to *R. roribaccus*. Some of these many taxa may be worth recognizing, and will be examined further when M. Medley's colls. are processed at WKY.

HAB f-10,7,11 C 5. **ABU** g9? s9? +1?

0703--*Rubus roribaccus* (Bailey) Rydb.

Rosaceae <Rubeae>: *Rubus* <Flagellares> *roribaccus* (*injunctus*, *temerarius*; *enslenii* var. *pleuralis*)

This taxon is known mostly from central Appalachian regions (F). These plants differ from typical *flagellaris* in their much more pubescent leaves and relatively short upper simple bracts. Although often appearing distinct, it is not clear if full species status is warranted; see also notes under *R. flagellaris*.

Included in the map here are a few records of the closely related taxa, *R. temerarius* Bailey and *R. injunctus* Bailey, which differ in their glabrous pedicels (F). Some records may also be derived from the cultivar of *roribaccus* from W.Va. named "Lucretia Dewberry", which was widely distributed after 1876 (SC). Plants similar to *roribaccus* with more condensed corymbs (versus small, ascendate clusters) have been referred to *R. curtipes* Bailey by Widrechner (1998), including *R. subtentus* Bailey from Ky., but the rationale for this remains unclear (see also *R. laudatus*).

HAB f-10? B? 5. **ABU** g9? s8? -2?

0704--*Rubus depavitus* Bailey

Rosaceae <Rubeae>: *Rubus* <Flagellares> *depavitus* (*kentuckiensis*, *profusiflorus*, ?*invisus*)

This taxon is known mostly from mid-Atlantic states to the Ohio Valley and southern Great Lakes (F). These plants differ from typical *flagellaris* in having dense glands on pedicels, rachises, petioles and often canes. Most colls. from Ky. have been referred to *R. kentuckiensis* Bailey, which is combined here and by several previous authors (M, K).

Some relatively hairy colls., mapped here as uncertain records, have been referred to *R. invisus* (Bailey) Britt. (BULL, CLAR, MADI, MCRE), *R. exsularis* Bailey (CLAY), *R. deamii* Bailey (= *R. rosagnetis* Bailey; JACK, NELS, OLDH) or *R. centralis* (MCRE). All of these glandular plants have been united by Gl, St and others under *R. invisus*, which itself had been initially described as *R. flagellaris* var. *invisus* Bailey. Further revision is needed.

HAB f-10? B? 5. **ABU** g8? s8? -2?

0705--*Rubus indianensis* L.H. Bailey

Rosaceae <Rubeae>: *Rubus* <Flagellares> *indianensis*

This is previously known only from s. Ind. (Bailey 1943; D, F). There are colls. that appear to be this species from HARD (F.L. Johnson & W.J. Anderson #K-0612 at OKL) and perhaps BATH (M. Medley for WKY).

HAB r-10,12? C? 5. **ABU** g4? s4? -1?

0706--*Rubus whartoniae* Bailey

Rosaceae <Rubeae>: *Rubus* <Flagellares> *whartoniae*

Typical *whartoniae* is known only from the Knobs region of Ky. and from e. Tenn. (Claiborne Co.). Similar plants in Md. and elsewhere in eastern states have been included by some authors but probably in error. The taxon may be relatively distinct in form and habitat (Medley 1986). However, H.A. Davis (pers. comm. to MM) indicated that the coll. from CLAR cited as a paratype in Bailey's description is in fact the superficially similar species, *roribaccus*.

HAB r-10,12 +? B? 5. **ABU** g4? s4? -3?

0707--*Rubus hispidus* L.

Rosaceae <Rubeae>: *Rubus* <Hispidi> *hispidus*

Within Ky. and Tenn., this northeastern species is locally common but largely restricted to boggy sites in or near Appalachian regions. Records from CALL and HICK (CW) are omitted here, pending verification.

Some colls. from MONT and POWE (KY) may be referable to *R. trifrons* Blanch., which is a northern taxon reportedly of hybrid origin from *R. hispidus* and the northern species, *R. setosus* Bigel. (Cr). These and other unusual colls. (e.g. J. Campbell on 15 Sep 1989 from WHIT at KY) deserve further study. Several close relatives of *hispidus* are known in states to the north and east, but have not been thoroughly searched for among Ky. colls. **HAB** f-9,6 B 4. **ABU** g8 s8 -3.

0708--*Rubus aboriginum* Rydb.

Rosaceae <Rubeae>: *Rubus* <Tholiformes> *aboriginum* (*decor*)

This poorly understood southeastern taxon, and perhaps *trifrons* (see notes under *hispidus*), are the only taxa in Ky. that have been included within the largely northeastern section *Tholiformes* (F). But that section may be an unnatural, miscellaneous complex (L. Alice et al., pers. comm.; FNA, in press), partly originating from various hybrids of *hispidus* or its relatives with *alleggheniensis*, *setosus* (Cr), *flagellaris* (F) or others. *R. decor* Bailey is included here (Davis 1990, M); it was initially known only from w. Ky. (F).

R. aboriginum may be considered just a somewhat hairy variant within the *flagellaris* group (Bailey 1943). It appears close to *roribaccus*, but differs in its usually single flowers (versus 2-8), calyx lobes with a prominent spathulate 1-3 mm tip, leaf margins with jagged-incised (versus regular serration), and leaf bases less cordate (Widrelechner 1998). *R. aboriginum* is mostly recorded from the lower Mississippi Valley, especially west of the river. Some octoploid cultivars have been selected among these plants, perhaps allowing further spread.

HAB f-10? C? 4? **ABU** g8? s8? -1?

0709--*Rubus canadensis* L.

Rosaceae <Rubeae>: *Rubus* <Canadenses> *canadensis*

In Ky. this thornless northeastern species is known only from Big Black Mountain in HARL (B, M).

HAB 8,7 C 4. **ABU** g10 s3? =.

0710--*Rubus allegheniensis* Porter var. *alleggheniensis*

Rosaceae <Rubeae>: *Rubus* <Alleghenienses> *alleggheniensis* var. *a.*

This widespread species of northeastern woodlands extends south into Appalachian regions and other hills. In Ky. it extends into the Knobs but more western records remain somewhat dubious. Some uncertain records may

reflect hybridization with pensilvanicus (or related taxa); see notes under alumnus.

HAB 7,8,5,11 C 4. **ABU** g9 s9 -1?

0711--*Rubus allegheniensis* Porter var. *gravesii* Fern.

Rosaceae <Rubeae>: *Rubus* <Alleghenienses> allegheniensis var. gravesii
This variety is pleasantly notable because it has no prickles or only a few small ones, but it may not be worth recognizing. The possibility of introgression with canadensis should be investigated.

HAB 7,5? C 4. **ABU** g8? s8 -1?

0712--*Rubus alumnus* Bailey

Rosaceae <Rubeae>: *Rubus* <Alleghenienses> alumnus (miriflorus, trux, ?rosa)

This northeastern taxon appears close to allegheniensis, and might be included in a broad species concept; these taxa have similar distributions in Ky. However, Widrechner (1998) has revised the concept of alumnus to include some taxa that have generally been treated within section Arguti (e.g. bellobatulus).

R. alumnus has relatively broad inflorescence summits, relatively large-flowers (2-4 cm broad) and large-fruits (1.5-2 cm long). It tends to occur in relatively dry, open areas. As interpreted by F, alumnus has sometimes been cultivated, being the "source of several horticultural varieties", which has led to some increase in its total range. Named cultivars are mostly polyploids from northeastern regions and some may be referred to the exceptionally robust, broad-leafleted plants known as *R. rosa* Bailey, which was included by F but retained as a distinct species by H.A. Davis (SC), Widrechner (1998) and others.

HAB f-10,8 C? 5. **ABU** g9? s8? +1?

0713--*Rubus argutus* Link

Rosaceae <Rubeae>: *Rubus* <Arguti> argutus (immanis, betulifolius, jugosus, louisianus, suus, ?arvensis)

This widespread southeastern taxon could include most of the old-field blackberries in Ky., but there has been much confusion with the pensilvanicus group. Typical argutus has been considered to differ from these other taxa in its simply, sharp-serrate leaves, with teeth up to 3-6 mm deep (versus doubly serrate, the teeth up to ca. 2-4 mm deep). Typical pensilvanicus has doubly

serrate leaves (like most of the extra taxa listed below), but generally broader leaflets and broader petals than argutus.

Mapped records include the closely related taxa, *R. betulifolius* Small (BREC), *R. immanis* Ashe (JEFF, LESL), *R. jugosus* Bailey (BULL, JESS, MONT, MCRE, ROWA), *R. louisianus* Berger (BREC, CLIN, MCRE, POWE), *R. suus* Bailey (BRAC, CAMP, FAYE), and *R. arvensis* Bailey (BREC, MONT, LESL). This complex will be studied further when M. Medley's colls. are processed at WKY. Some of these names have been considered synonyms, especially under immanis; some may represent transitions from argutus to pensilvanicus and its allies, or have unsettled affinity (F, St; Widrechner 1998). *R. arvensis* may be relatively distinct, with lower leaf surfaces whitish to glaucous and covered by short hairs.

HAB f-10,8 D 5. **ABU** g9? s8? +3?

0714--*Rubus bellobatulus* Bailey R

Rosaceae <Rubeae>: *Rubus* <Arguti> bellobatulus

F indicated that this taxon is largely northeastern, but "cult. and locally spread elsewhere." Its native range may extend south only to W.Va. (unpublished maps of H.A. Davis and M. Medley). *R. bellobatulus* differs from pensilvanicus (F) in its cylindric, racemose inflorescence (versus somewhat corymbose), which is slightly glandular, prompting Widrechner (1998) to include it within alumnus (see above). It was reported from GRAV and MARS by Davis et al. (1969), but their sources need to be checked. An allied taxon, *R. mollior* Bailey, is centered in the Ozark region (St) but not reported from Ky.

0715--*Rubus laudatus* Berger

Rosaceae <Rubeae>: *Rubus* <Arguti> laudatus (praepes, congruus, condensiflorus, gattingeri)

This taxon has been widely mapped in Ky., W.Va. (SC) and some other eastern states (Bailey 1945; F). It is retained here pending further study, but the claimed differences from pensilvanicus may be rather inconsistent: its irregularly lobulate terminal primocane leaflets, and its more leafy (D) or racemiform (SC) inflorescence. There do not appear to be notable differences in range or habitat. Included here are records of *R. condensiflorus* Bailey, *R. congruus* Bailey, *R. gattingeri* Bailey and *R. praepes* Bailey, which have been considered synonymous with *R. laudatus* by Davis et al. (1955, 1967-69, 1990; see also M and K).

HAB f-10,8 C? 5. **ABU** g9? s9? +2?

0716--*Rubus pensilvanicus* Poir.

Rosaceae <Rubeae>: *Rubus* <Arguti> *pensilvanicus* (?*abactus*, ?*philadelphicus*, ?*ostryifolius*)

This northeastern taxon can probably be considered widespread in the state, but there has been much taxonomic confusion with *argutus* and allied taxa. Typical *pensilvanicus*, as interpreted by F and mapped here, includes the closely related species *R. abactus* Bailey (POWE), *R. philadelphicus* Blanch (ESTI, FAYE, PULA, RUSS), and *R. ostryifolius* Rydb. (CAMP, KENT). This complex will be studied further when MM's colls. are processed at WKY.

Plants with leaf margins irregularly deep-lobulate have been tentatively segregated as *laudatus* (see under that name). Plants with more numerous large foliaceous bracts have also been segregated by some authors, but it is not clear in Ky. if these should be grouped with *frondosus* (B, F) or *pensilvanicus* (Gl, St). Moreover, Widrelechner (1998) interpreted common old-field blackberries of this group in Iowa and adjacent states as *R. ablatus* Bailey, which F included under *jugosus* (see notes under *argutus*).

HAB f-10,8 D 5. **ABU** g10? s10? +3?

0717--*Rubus frondosus* Bigelow

Rosaceae <Rubeae>: *Rubus* <Arguti> *frondosus*

Widrelechner (1998) interpreted this species as widespread across northern states, especially in the upper midwest. These plants have relatively numerous large foliaceous bracts, but their distinction and correct name remains uncertain; see notes under *pensilvanicus*. They are mapped here tentatively, pending further revision.

HAB f-10,7? D? 5. **ABU** g8? s8? -1?

0718--*Agrimonia parviflora* Ait.

Rosaceae <Sanguisorbeae>: *Agrimonia parviflora*

This is widespread on wet soils from eastern states to Mexico.

HAB 9,6,4 C 4. **ABU** g10 s9 -3.

0719--*Agrimonia rostellata* Wallr.

Rosaceae <Sanguisorbeae>: *Agrimonia rostellata*

This occurs mostly in east-central states, usually in mesic to submesic woods.

HAB 7,5,4? D 2. **ABU** g10 s10 -2.

0720--*Agrimonia gryposepala* Wallr.

Rosaceae <Sanguisorbeae>: *Agrimonia gryposepala*

This is a northern and montane species (also in the Rockies) than extends south at high elevation in the southern Appalachians, including the Cumberland Mts. of Ky. The disjunct record from MADI (BEREA) is verified: J.S. Bergen, 6 Jul 1925, damp woods, [Berea] College woods. However, some other western records have been erroneous.

HAB 7? C? 3? **ABU** g10 s4 -1?

0721--*Agrimonia striata* Michx. R

Rosaceae <Sanguisorbeae>: *Agrimonia striata*

It seems possible that this widespread northern species could occur in the Cumberland Mountains, as reported by Kearney (1893) and others, but no coll. has been located (M). There has been some confusion with *pubescens*, and verified colls. of *striata* are unknown in Va, N.C. or S.C., even at high elevation (W).

0722--*Agrimonia microcarpa* Wallr.

Rosaceae <Sanguisorbeae>: *Agrimonia microcarpa* (*pubescens* var. *m.*)

This is a widely reported southeastern species, as treated by F and other, but its presence in Ky. and Tenn. (Ch) has been controversial. It is close to *pubescens*, and some colls. may be somewhat intermediate. Although Wessel & Thieret (2000) doubted the identification of this species in the state, there are colls. from MADI (G.W. Libby OB-725, EKY), JEFF (P. Haragan, Olmstead Parks herbarium), OLDH (H. Peterson, DHL), and ROWA (A. Risk, MDKY) that do fall within its traditional circumscription.

HAB 7,11? C? 3? **ABU** g9 s3? -2?

0723--*Agrimonia pubescens* Wallr.

Rosaceae <Sanguisorbeae>: *Agrimonia pubescens* (var. *p.*)

This occurs mostly in east-central states, with similar range and habitats to *rostellata*, but it is somewhat more northern and it tends to grow on drier sites. The two species often occur together in Ky.

HAB 7,10,11 D 3. **ABU** g10 s10 -2.

0724--*Sanguisorba canadensis* L.

Rosaceae <Sanguisorbeae>: *Sanguisorba canadensis*

This northeastern species extends south into the higher Appalachians on wet sites. In Ky. it is known only from the waterfall at Bad Branch in LETC; there was also a report from BOYD by R. Athey (pers. comm. to MM).

HAB 9,1 ~| C 4. **ABU** g10 s2 -2?

0725--*Poterium sanguisorba* L. ssp. *muricatum* (Spach) Rouy C

Rosaceae <Sanguisorbeae>: *Poterium* [*Sanguisorba*] *sanguisorba* ssp. *muricatum* (S. minor ssp. *muricata*)

This cultivated herb ("salad burnet") is locally escaped or perhaps somewhat persistent in northeastern North America (F, W). The only record for Ky. comes from B, who collected it from a "grassy field" in KENT.

ALI EU.

0726--*Aphanes microcarpa* (Boiss. & Reut.) Rothm.

Rosaceae <Sanguisorbeae>: *Aphanes* [*Alchemilla*] *microcarpa*

This annual lawn weed from southern Europe is scattered through southeastern states but easily overlooked. It was first collected in Ky. from MADI, on mowed ground in 1994 (Abbott et al. 2001). Other records come from CALL (Poindexter & Thompson 2008), JEFF and WASH (herbarium of Ind, Univ. SE).

ALI EU. **HAB** S-10 ::? D? 6? **ABU** +4.

0727--*Rosa bracteata* J.C. Wendl. R

Rosaceae <Roseae>: *Rosa* <Bracteatae> *bracteata*

This evergreen diploid (2n = 14) was reported by BA, and recently mapped by SE in HICK, but no collection has been located. Well-established persistent plantings or escapes are common on rich soils in warmer zones of southeastern states, extending north to c. Ark., s. Tenn. and e. Va. (F, Cr, W).

ALI AS.

0728--*Rosa setigera* Michx. var. *setigera*

Rosaceae <Roseae>: *Rosa* <Synstyleae> *setigera* var. s.

This diploid is widespread across much of eastern North America, and perhaps somewhat adventive. But it is rare or absent in some hilly areas with less fertile soils, as in the Appalachian hills of Ky. and Tenn. (Ch). Open dots indicate the reliable published records of the species but not det. to variety.

HAB f-8,10,7 D 4. **ABU** g9 s9 -2?

0729--*Rosa setigera* Michx. var. *tomentosa* Torr. & Gray

Rosaceae <Roseae>: *Rosa* <Synstyleae> *setigera* var. *tomentosa*

This hairy-leaved segregate is centered in the midwest, but overlaps much with typical *setigera* on the modern landscape (Lewis 1958). It has not been recognized in most recent treatments (Cr, W).

HAB f-8,10,7 D 4. **ABU** g9 s8 -2?

0730--*Rosa multiflora* Thunb. ex Murr.

Rosaceae <Roseae>: *Rosa* <Synstyleae> *multiflora*

This East Asian diploid was promoted for "living fences" by the USDA and other organizations from the 1930s to the 1960s (Patterson 1976). Its subsequent invasion across eastern states is a prickly example of the need for more botanical education and common sense in society. Brown (1967) provided the first verified record as a naturalized species in Ky.

ALI AS. **HAB** f-8,10,7,4 C 4. **ABU** +6*.

0731--*Rosa wichuraiana* Crépin

Rosaceae <Roseae>: *Rosa* <Synstyleae> *wichuraiana* (*luciae* p.p.)

This commonly cultivated diploid is a scrambler ("memorial rose" or "rambling rose") that may be included within the broader species concept of *R. luciae* Franchet & Roehrborn ex Crépin (W; FNA in prep.). It is similar to *multiflora*, but differs in the generally larger dimensions of its flowers and fruits (W); some colls. should be rechecked. Flowers vary in size and color, from deep rose-pink to white. The common form in southeastern states (as "Dorothy Perkins") is usually pink with doubled petals (RAB). These plants can also be confused with *X centifolia*; see notes under *gallica*.

ALI AS. **HAB** f-8? C? 4. **ABU** +4.

0732--*Rosa palustris* Marsh.

Rosaceae <Roseae>: *Rosa* <Cinnamomeae> *palustris* ("carolina")

This diploid is widespread on wet sites across most of eastern North America, but in Ky. it is largely absent from the Bluegrass region. *R. palustris* differs from *carolina* in its stouter, often hooked, infrastipular stipules (suggesting *virginiana*), its stipules with a longer adnate ("caniculate") portion, and its leaves with more numerous, finer serration (F).

The related southwestern species, *R. foliolosa* Nutt. ex Torr. & Gray, has more numerous, elongated leaflets, and may be expected in w. Tenn and w. Ky. (W; FNA in prep.). BA's report of the more northern species, *R. blanda* Ait., was based on a misidentified coll. of *palustris* from EDMO (KY).

HAB 9,2,6 C? 4. **ABU** g10 s8 -3.

0733--*Rosa carolina* L. var. *carolina*

Rosaceae <Roseae>: *Rosa* <Cinnamomeae> *carolina* var. c. (*humilis*)

This is a widespread eastern tetraploid ($2n = 28$). The typical variety (including var. *glandulosa* (Crepin) Farw.) is predominant in Ky. Open dots indicate good published records of the species, but without det. of variety.

HAB 12,11,7,10 D 3. **ABU** g10 s10 -2.

0734--*Rosa carolina* L. var. *villosa* (Best) Rehd.

Rosaceae <Roseae>: *Rosa* <Cinnamomeae> *carolina* var. *villosa* (lyoni)

This segregate has not been recognized in some recent treatments; although centered in midwestern regions, there is much overlap in range with typical *carolina*. Var. *villosa* has traditionally been recognized from its relatively hairy leaves. But it is generally equivalent to ssp. *subserrulata* (Rydberg) W.H. Lewis, which is best distinguished by its relatively robust stems, often stouter infrastipular thorns, and denser internodal prickles (Lewis 2008).

HAB 12, 11, 7, 10 D 3. **ABU** g9 s8 -2.

0735--*Rosa virginiana* P. Mill. W

Rosaceae <Roseae>: *Rosa* <Cinnamomeae> *virginiana* (*lucida*)

This largely northeastern tetraploid has been reported south to n. Ga., ne. Tenn. and n. Mo., but it occurs mostly in coastal regions from N.J. to Nfld., with few records far inland (F, Cr; Lewis 2008). There have been several reports of this species from Ky. (M, J), but most have been based on misidentifications. Clark et al. (2005; see also CW) reported colls. from six counties. The coll. from ROWA (EKY), at least, is verified here: E.M. & E.T. Browne #10492, 28 Jun 1965, from roadsides/fallow land 0.6 mi W of Haldeman P.O. on Ky 174. Apparent hybrids with *carolina* are known (*X novae-angliae* W.H. Lewis), and differences are not obvious in some colls.

R. virginiana becomes an upright taller plant, usually to 2 m (versus somewhat pendent, up to 1 m in *carolina*), and is much less colonial. Its infrastipular thorns are more or less curved and taper gradually from relatively stout flattened bases (versus straight or declining, less tapering, slender, terete); also, acicular thorns are generally concentrated or restricted to stem bases (versus often numerous on upper branches). Its stipules tend to be more dilated upwards into broader lanceolate tips that are less divergent; adnate portions are usually 4-9 mm wide (versus 1-4 mm). Its leaflets are usually 7-9 (versus 3-7), clearly lustrous (versus dull to slightly lustrous). Its corymbs have up to 6 (15) flowers (versus 3 (6)), with more than one often on stems of the season (versus usually solitary); sepals are up to 20 mm (versus 12 mm).

ALI e.

0736--*Rosa canina* L.

Rosaceae <Roseae>: *Rosa* <Caninae> *canina*

This polyploid ($2n = 35$) has been widely cultivated in northeastern regions, especially for its fruits, and it may be occasionally naturalized. Some identifications in Ky. are tentative; see notes under *rubiginosa*. There is also a reported coll. (at NY) of the hybrid with *R. obtusifolium* Desv., known as *X dumetorum* Thuill. (M).

ALI EU. **HAB** f-8? D? 4. **ABU** +4.

0737--*Rosa rubiginosa* L.

Rosaceae <Roseae>: *Rosa* <Caninae> *rubiginosa* (var. r.; "eglanteria"*; ?*micrantha*)

This is a variable polyploid species, as currently defined to include *R. micrantha* Borrer ex Sm. ($2n = 28, 35, 42$), which has been treated as a variety. See W and FNA (in prep.) for recent notes on nomenclature and taxonomy. In Ky. most plants have been identified as *micrantha*, and there has also been confusion with *canina*; further revision is desirable. These roses often persist from plantings, but it is generally not clear from colls. if the plants are truly naturalized from seed.

ALI EU. **HAB** f-8? D? 4. **ABU** +4.

0738--*Rosa gallica* L. C

Rosaceae <Roseae>: *Rosa* <Gallicanae> *gallica*

This tetraploid ($2n = 28$) is the most common cultivated rose of gardens (often known as "French rose"). There are reported colls. from ELLI (A. Cusick, pers. comm.) and WHIT (MM for WKY), but the degree of naturalization remains uncertain (CW). The old hybrid with small globular multi-petaled flowers known as *R. X centifolia* L. or *R. gallica* var. *centifolia* (L.) Regel ("cabbage rose") is derived from a complex of *gallica* and other species. It has been widely cultivated, and often persists at old home sites.

ALI EU.

0739--*Rosa rugosa* Thunb. C

Rosaceae <Roseae>: *Rosa* <Cassiorhodon> *rugosa*

Although widely cultivated across east-central states, this diploid does not appear to be increasing in the wild. The few records from Ky. may only be from plantings (M, CW).

ALI AS.

0740--*Rosa spinosissima* L. C

Rosaceae <Roseae>: Rosa <Pimpinellifoliae> spinosissima (pimpinellifolia)
This tetraploid (or its derived cultivars) is often cultivated (as "Scotch rose"), but it does not generally appear to be naturalizing in eastern states. Our only record for Ky. is an apparently self-seeded plant collected from CALL: M. Medley & R. Cassell #13788-86 (for WKY).
ALI EU.

0741--Prunus persica (L.) Batsch

Rosaceae <Pruneae>: Prunus <Amygdalus> persica
This popular fruit tree (the peach) is widely grown in southeastern states, often persistent, and occasionally spreading from seed. In Ky. most records may be from old plantings, but it does appear to have spread from seed at some sites.

ALI EU. **HAB** f-8 D 4. **ABU** +5.

0742--Prunus avium (L.) L.

Rosaceae <Pruneae>: Prunus <Cerasus> avium
This diploid is the common, commercially cultivated cherry, and often persistent or naturalized in eastern North America. In Ky. some records may be from old plantings, but these often spread with root sprouts; the species has also established from seed at several sites.

ALI EU. **HAB** 8,7,11 D 4. **ABU** +5.

0743--Prunus cerasus L.

Rosaceae <Pruneae>: Prunus <Cerasus> cerasus
This tetraploid (2n = 32) is a cultigen ("sour-" or "pie-cherry") that may be derived from P. avium L. and P. fruticosa Palls (Cr). It is occasionally persistent or naturalized in eastern states, but, as with avium, the context of most records from Ky. remains somewhat uncertain.

ALI EU. **HAB** 8,7? C? 4? **ABU** +4.

0744--Prunus mahaleb L.

Rosaceae <Pruneae>: Prunus <Cerasus> mahaleb
This diploid from the Mediterranean region was widely used across eastern states as rootstock for other cherries during the 19th Century. Also, its unusually perfumed flowers and spiced seeds have various uses. In Ky. it has persisted and escaped mostly on dry, rocky calcareous slopes of the Bluegrass region.

ALI EU. **HAB** 12,11 \ E 4. **ABU** +4.

0745--Prunus pensylvanica L. f. R

Rosaceae <Pruneae>: Prunus <Cerasus> pensylvanica
This is a widespread, variable northern species (2n = 16, 32). It extends south along the Blue Ridge, and may be expected in the Cumberland Mts. of Ky. There are several old reports from the state, but no convincing colls. have been located (M). Little (1977) mapped it in SHEL and there is a verified coll. from JEFF (GH), but in a possibly horticultural context: D. Blumer-Whultermuth [?] #258, "wild red cherry", 2 Apr 1933, cliff, lakeside, Louisville.

The related midwestern plant, P. pumila L. var. depressa (Pursh) Gleason, was listed for Ky. by Short et al. (1833) and others, but no known colls. are traceable to Ky. (M).

0746--Prunus pumila L. var. depressa (Pursh) Gleason R

Rosaceae <Pruneae>: Prunus <Lithocerasus> pumila var. pumila
This northeastern taxon was listed as P. depressa for Ky. by Short et al. (1833) and Riddell (1835), but no known colls. are traceable to Ky. (M). It is verified from c. W.Va. and e. Tenn. (PL, W).

0747--Prunus virginiana L.

Rosaceae <Pruneae>: Prunus <Padus> virginiana
This diploid (2n = 12) is widespread across North America except for southeastern states, where it extends south to Ga. but only at higher elevation. Almost all verified records in Ky. since 1980 are from the Kentucky River Palisades, where it occurs on or near rocky limestone points. Most records elsewhere remain unverified. B collected it from a "heath bald" in LETC (check US), and reported it from CART and MCRE; M collected it in LEWI (for WKY).

HAB 11,8,12 \ D 3. **ABU** g10 s6 -1.

0748--Prunus serotina Ehrh.

Rosaceae <Pruneae>: Prunus <Padus> serotina
This tetraploid (2n = 32) is widespread across eastern and central North America; it also extends south to Guatemala (Cr). In Ky. it is perhaps the most widespread woody species, based on occurrence of seedlings, but it is only locally dominant as mature trees.

HAB 8,7,5 D 3. **ABU** g10 s10 -1.

0749--Prunus angustifolia Marsh.

Rosaceae <Pruneae>: *Prunus* <Prunophora> *angustifolia*

This is a widespread southeastern species, closely related to the more northern *munsoniana*, *hortulana* and *nigra* (Shaw & Small 2005). These are all diploids ($2n = 16$) that share the following features: relatively blunt, gland-tipped leaf-teeth; sepals with or without marginal glands; and sweetening red or yellowish fruits, usually without glaucous bloom. They require full sun for fruit production, do not survive long in woods or even partial shade, and were often cultivated around camps and villages of native people. Extensive thickets of *angustifolia* or its allies have virtually disappeared in Ky. and Tenn., but they are reported to survive in the Black Belt of Ala. and Miss. (NS; type CEG 007747).

Some colls. of *angustifolia* may be from human plantings, as in FAYE (KY) at the old cabin above Elk Lick Falls. Plants at the old Annis Ferry in BUTL have at least three color forms in the fruit (yellowish, salmon-pinkish and deep red), also tasting different. These clones are adjacent to an ancient village site of the Mississippian era and before. *P. angustifolia* is presumably the plum referred to in De Soto's chronicles during his military tour of the southeastern states during the 16th Century: "finer than any grown in Spain" with "large quantities" of the dried fruits found stored in villages; see citations by C.W. Cowan in Ford (1985). Rafinesque (1836, 1:31-32) suggested that this species was spread to the north by Indian tribes.

HAB 8,10,12 C 4. **ABU** g9 s8 -3.

0750--*Prunus munsoniana* W. Wight & Hedrick

Rosaceae <Pruneae>: *Prunus* <Prunophora> *munsoniana*

This species has been much confused with *angustifolia* and *hortulana*. It was not described until 1911, and not recognized in Ky. until B found it on "dry slopes in the Outer Bluegrass" during the 1930s. Uncertain records mapped here (open dots) are mostly dubious records of *hortulana*, which has not been reliably distinguished in Ky. The native range of *munsoniana* is reportedly similar to the largely lower midwestern *hortulana* but shifted slightly to the south and east (K, PL). Typical wild-type *munsoniana* may have been centered in c. Ky. and e. Tenn., but the species has been widely grown with varied cultivars and hybrids. In the central Bluegrass, Short (1828-9) noted, under "*Prunus chिकासа*... Frequent in shrubberies occasionally occurring wild." *P. munsoniana* is now largely restricted to old home sites, fencerows and thickets at the edge of old fields. As well as widespread cultivation after Virginian settlement, it is likely that Native Americans used and dispersed this valuable fruit-producer.

P. munsoniana generally appears intermediate between *angustifolia* and *hortulana* in overall stature, flower size, fruit size and other characters (Hedrick 1911, Wight 1915, Little 1977, Shaw & Small 2004, 2005; F, GC, W). It tends to form taller trees than *angustifolia* but differs most clearly in its leaves, which are larger (mostly 5-10 cm long versus 3-6 cm), less folded and more pubescent on the lower surface. Also, it has longer pedicels (ca. 8-12 mm versus 3-8 mm) and tends to have larger fruit. However, there is much genetic variation in fruits, from relatively large sweet early-maturing ones in late June to those with much poorer quality for human consumption even at the end of their ripening in August.

HAB 8,10 E? 4. **ABU** g8 s8 -3.

0751--*Prunus hortulana* Bailey T

Rosaceae <Pruneae>: *Prunus* <Prunophora> *hortulana*

This is a rather poorly understood taxon, not described until 1892. Although typical *hortulana* have may originated in the Ozark region, supposed native plants have also been referred to this species from across the central Mississippi and lower Ohio Valley. In Ky. there are colls. from BALL (KY), CAMP (GH, US), HARD (DHL, Oklahoma) and elsewhere that have been named *hortulana* by reasonable botanists, but deeper analysis is needed to determine if this species is truly distinct and wild in the state. The situation is complicated by much past cultivation and probable hybridization among plums.

P. hortulana appears close to *munsoniana*, which has often been confused (Hedrick 1911, Wight 1915; D, F, GC, St), but it may be closer to *mexicana* in its DNA (Shaw & Small 2004, 2005). Characters used to separate *hortulana* from *munsoniana* have been varied (see above sources for details): fruits ripening in late Jul to Oct (versus late Jun to Aug), the stones pointed at both ends (versus truncate at base); larger flowers, produced on slender branches (versus lateral spurs), often appearing after leaves (versus before); leaves larger, becoming flatter (versus folded) and glabrate (versus thin hairy); leaf teeth more pointed and spreading, with glands at tip (versus adjacent to the sinus); plants usually not suckering from lateral roots.

HAB 8,10,9? E? 4. **ABU** g8? s3? -3.

0752--*Prunus nigra* Ait. R

Rosaceae <Pruneae>: *Prunus* <Prunophora> *nigra* (*americana* var. n.)

There have been a few reports of this northeastern species from Ky. (e.g. Greenwell 1935), but no verified colls. are known. There has been some confusion in nomenclature with *P. americana* var. *lanata* (B, M).

0753--*Prunus mexicana* S. Wats.

Rosaceae <Pruneae>: *Prunus* <Prunophora> *mexicana* (*americana* var. *lanata*)
Mapping here is provisional; see also notes under *americana*. Most plants mapped here may not match typical *mexicana*, which might well be reduced to a variety of *americana*. However, the coll. from BALL (GH) appears to match typical *mexicana*: E.J. Palmer #16511, 20 Sep 1919, low hills, Wickliffe. *P. americana* var. *lanata* Sudsworth may be the appropriate name for intermediate plants that prevail in Ky.

Typical *mexicana* reportedly differs from *americana* (Cr, W) in its shorter petals (ca. 8-10 mm versus 10-15 mm); sepals hairy on both sides (versus glabrous, at least on lower side); leaves often larger, with more truncate bases (versus attenuate), permanently soft-hairy below (versus hairy to glabrate), the petioles usually with a pair of glands (versus mostly glandless); trunk less thorny and less thicket-forming, often with more robust tree-like habit.

HAB 8,7,11 D 3. **ABU** g10? s9 -2.

0754--*Prunus americana* Marsh.

Rosaceae <Pruneae>: *Prunus* <Prunophora> *americana* (var. a.)
Within eastern North America, there appears to be a cline from the northeastern *americana* to the largely southwestern *mexicana* (Shaw & Small 2004, 2005). Both taxa have acute-acuminate, glandless leaf teeth; sepals without marginal glands; and sour, red-purplish fruit, usually with a glaucous bloom.

Although plums in general are still widespread across Ky., extensive thickets have declined much since B's time and before. Historical records and associated place names (e.g. "Plum" along Cane Ridge in BOUR) suggest that many disturbed areas on fertile soils were formerly dominated by plums in the Ohio Valley. Strips occurred along major trails through some valleys and on some watershed divides of the Bluegrass region, often with *Arundinaria gigantea* (e.g. Beckner 1928, Campbell 1989; and continuing research). Remnants of such vegetation have largely disappeared from eastern states, but they still exist in varied forms further west (NS; type CEG 001108). See also notes under *angustifolia*.

HAB 8,7 D 3. **ABU** g10 s9 -2.

0755--*Prunus alleghaniensis* Porter R

Rosaceae <Pruneae>: *Prunus* <Prunophora> *alleghaniensis*
This central Appalachian species occurs mostly in rocky woods of the Ridge-and-Valley region from Conn. to Tenn., and it may be expected in the Cumberland Mts. of Ky. There is a coll. of E.L. Braun (# 4944) from MCRE that has been named *allegheniensis*, according to M (check US).

0756--*Prunus domestica* L. C

Rosaceae <Pruneae>: *Prunus* <Prunophora> *domestica*
This variable polyploid ($2n = 48$) is the common, commercially produced plum, probably derived from *P. cerasifera* Ehrh. and *P. spinosa* L. Although widely grown and often persistent in eastern states, there is little evidence of spread from seed. Ky. records include colls. from persistent trees in LYON and TRIG (Chester 1992; APSU).

ALI EU.

0757--*Chaenomeles speciosa* (Sweet) Nakai

Rosaceae <Pomeae>: *Chaenomeles speciosa* (*lagenaria*; "japonica"; "X *superba*")

This ornamental shrub is widely grown in northeastern states (as "flowering quince" or often just "Japonica"). Some horticultural literature indicates that the common cultivar was developed in Japan as a hybrid ("X *superba*") of *speciosa*, a Chinese species, with *C. japonica* Lindl., but there is little difference from typical *speciosa* (e.g. Wang et al. 2010). Although very persistent from old plantings, this plant has not generally been considered naturalized until recent decades (after F and Cr). Browne (1974) provided the first record of persistent plants in Ky., and establishment from seed has not yet been documented.

ALI AS. **HAB** f-8 D? 4. **ABU** +4.

0758--*Pyrus communis* L.

Rosaceae <Pomeae>: *Pyrus communis*
This is the common pear, widely planted across eastern North America. Some records mapped here may be from old plantings, but this species has apparently established from seed at many sites in Ky. Older naturalized populations may revert to smaller fruit size in some cases. During recent decades, development of edible pears for market in North America has also involved the East Asian species, *P. pyrifolia* (Burm. f.) Nakai, which has

globose fruit that lack persistent calyx. That species may be expected in cultivation but is not known to have spread from seed (W).

ALI EU. HAB f-8,10 D? 4. **ABU** +4.

0759--Pyrus calleryana Dcne.

Rosaceae <Pomeae>: *Pyrus calleryana*

After 1970, a few selections of this Chinese tree became promoted for ornamental use across eastern states due to their rapid growth and profuse early blossoms. The original "Bradford" and later "Aristocrat" became some of the most widely distributed, clonally propagated cultivars. Although often marketed as thornless, most or all plants have capacity for reversion to a dangerously thorny condition in stump sprouts and saplings from seed.

This species did not appear invasive at first, but its spread accelerated in the 1990s apparently due to the increased variety of cultivars, leading to more fertile cross-pollinated seed (Vincent 2005; Culley & Hardiman 2007, 2009). In Ky. all naturalized records date from after 1993 (M), and *calleryana* is now becoming common in urban areas and along major highways. Vincent provided much new data on this species in Ky. The situation is complicated by varied parentage in some cultivars that are grouped with *calleryana* (M. Vincent, pers. comm.). Most pears are diploids ($2n = 34$) and can interbreed. See also notes under "cf. *bretschneideri*."

ALI AS. HAB f-8,10,7? D? 4. **ABU** +5*.

0760--Pyrus bretschneideri Rehd. ?

Rosaceae <Pomeae>: *Pyrus* cf. *bretschneideri* (?= x *pyrifolia*)

This name has been tentatively applied to naturalized trees that are similar to *calleryana* but have larger fruit, ca. 1-3 cm in width. *P. bretschneideri* is a variable taxon of possible hybrid origin ($2n = 34, 51, 68$), perhaps involving *P. pyrifolia*, *P. betulifolia* Bunge or other species; see Vincent (2005) and Flora of China Vol. 9). It is possible that some cultivars presumed to be *calleryana* have such hybrid origin, and that there is segregated expression of a non-*calleryana* parent in the naturalization of these plants. Vincent cited the colls. mapped here from BULL and CAMP; the other records come from recent observations of JC. These records all date from after 1990.

ALI AS. HAB f-8,10,7? D? 4. **ABU** +4*.

0761--Malus baccata (L.) Borkh.

Rosaceae <Pomeae>: *Malus* [*Pyrus*] *baccata*

Several cultivars of this small Central Asian tree ("Siberian crab-apple") have become extensively planted across North America in recent decades. Self-sown escapes are becoming widely scattered across Ky., much more so than indicated by the few colls. mapped here. Leaves (unlobed) and twigs are largely glabrous; fruits are medium-sized (ca. 8-10 mm) with deciduous calyx. The horticultural taxonomy of these plants is complex (CW), with much variation in flower color, fruit color and other characters. However, only diploids are recorded ($2n = 34$); in other horticultural Eurasian species of *Malus*, there are varied chromosome numbers (Gu C-Z & S.A. Sponberg in Flora of China 9).

ALI AS. HAB f-8,7 D? 4. **ABU** +5*.

0762--Malus sieboldii (Regel) Rehd. C

Rosaceae <Pomeae>: *Malus* [*Pyrus*] *sieboldii*

This ornamental Japanese tree ("Toringo Crabapple") is widely planted in eastern states and it has occasionally escaped (Cr, PL, W). An apparently self-sown tree was recently found by JC in a wild garden of FAYE. *M. sieboldii* is a variable species, often with 3-4 styles (versus usually 5 in *Malus*), relatively small fruits (ca. 5-8 mm), and relatively narrow leaves that are often deeply lobed on long shoots.

ALI AS.

0763--Malus pumila P. Mill.

Rosaceae <Pomeae>: *Malus* [*Pyrus*] *pumila* (*sylvestris* ssp. *mitis*; *P. malus*)

This is the common cultivated apple. It is widely reported as escaped in North America but less frequently in warmer or drier regions, including s. Ky. and further south or west (PL). There has been some confusion in nomenclature between this species and *M. sylvestris* P. Mill. (the wild European crab apple), which is not verified in the state (M). Also, *pumila* can rarely hybridize with native apples (Sargent 1926; Cr).

ALI EU. HAB f-8,7 D? 4. **ABU** +5.

0764--Malus prunifolia (Willd.) Burkhardt C

Rosaceae <Pomeae>: *Malus* [*Pyrus*] *prunifolia*

This Chinese crabapple is becoming widely planted in eastern states and it occasionally escapes (Cr, PL, W). There is no definite evidence of naturalization yet in Ky., but an apparently self-sown tree was recently seen by JC in a wild garden of FAYE. *M. prunifolia* has relatively large fruit (ca. 2 cm) with persistent calyx, relatively broad unlobed glossy leaves, and pubescent twigs. A related species, *M. floribunda* Sieb. ex Van Houtte

("Japanese crab"), is also expected; it has deeper red fruit and less glossy leaves.

ALI AS.

0765--*Malus ioensis* (Wood) Britt.

Rosaceae <Pomeae>: *Malus* <Chloromeles> [Pyrus] *ioensis*

This diploid ($2n = 34$) of the central states may intergrade with *angustifolia* or *coronaria* in Ky., which lies across zones of overlap between all three taxa. Relatively pure *ioensis* appears concentrated in or near the gravelly hills of the Mississippian Embayment, where it may be a remnant from the open grassy woodlands that occurred here before settlement.

HAB 8,10,12 C 4. **ABU** g9 s5? -3.

0766--*Malus angustifolia* (Ait.) Michx. var. *angustifolia*

Rosaceae <Pomeae>: *Malus* <Chloromeles> [Pyrus] *angustifolia* var. a.

This variable southeastern species ($2n = 34, 68$) is often difficult to distinguish from *coronaria* or *ioensis*, and several records mapped here may be from intermediate plants. See notes under *coronaria*.

HAB 8,10,12 B 4. **ABU** g9 s7 -3.

0767--*Malus angustifolia* (Ait.) Michx. var. *puberula* Rehd.

Rosaceae <Pomeae>: *Malus* <Chloromeles> [Pyrus] *angustifolia* var. *puberula* (?*spinosa*)

This relatively hairy segregate has not been recognized in some recent treatments (Cr, W). Several records mapped here are tentative; some may be transitional to *ioensis*.

HAB 8,10,12 B? 4. **ABU** g8? s7? -3.

0768--*Malus coronaria* (L.) P. Mill.

Rosaceae <Pomeae>: *Malus* <Chloromeles> [Pyrus] *coronaria*

Although this tetraploid ($2n = 68$) is widely scattered in eastern states, at least on less fertile non-calcareous soils, it is generally not abundant. Most of the uncertain records mapped here as open dots are referable to var. *dasycalyx* Rehd., which may be transitional to *ioensis*, or to var. *lancifolia* (Rehd.) Fern., which may be transitional to *angustifolia*. These segregates have generally not been recognized in recent treatments (e.g. Cr, W).

Although native *Malus* is uncommon to rare in most regions of Ky., some historical clues suggest it was locally dominant during early settlement, e.g. the place name "Crab Orchard" in LINC along the old Wilderness Trail from

Va. There is a remarkable cluster of records from the less rugged uplands of MCRE and WHIT, where open grassy or brushy conditions appear to have occurred before settlement. In more agricultural areas of the state, native *Malus* appears to have declined much since settlement. In the central Bluegrass it is now unknown in the wild, but Short (1828-9) here noted: "The crab-apple, which was at one time more abundant than at present, is yet found occasionally in the more secluded woods of this county; and, where in clearing the land it has been allowed to remain, it forms a tree nearly equalling in magnitude the cultivated variety. The flowers of the wild crab are, indeed, more showy than those of the domestic apple tree...when in full bloom they produce a beautiful effect and diffuse a delicious odour to a great distance: The fruit is sometimes preserved with sugar."

HAB 8,10,12 C 4. **ABU** g9 s8 -3.

0769--*Aronia arbutifolia* (L.) Pers.

Rosaceae <Pomeae>: *Aronia* [Pyrus] *arbutifolia*

This is widespread on relatively wet, acid soils across much of eastern North America, but absent in the upper midwest. Putative hybrids with *melanocarpa* have been collected in CALL (WKY), LETC (B), MCRE (CW) and PULA (CW). Such plants are reported to form distinct populations in states east of Ky., sometimes treated as a distinct species with a broad northeastern range (PL, W): *A. prunifolia* (Marsh.) Rehd. [= *Photinia floribunda* (Lindl.) E.B. Phipps].

Note that *Aronia* has been included by K.R. Robertson & J.B. Phipps within the genus *Photinia* (as followed by K and PL). But if these genera are merged *Aronia* has priority (as reviewed by W).

HAB 9,6,12 B 4. **ABU** g9 s7? -3.

0770--*Aronia melanocarpa* (Michx.) Ell.

Rosaceae <Pomeae>: *Aronia* [Pyrus] *melanocarpa*

This is widespread on relatively dry, acid soils in northeastern regions, but overlapping much with *arbutifolia* (K, PL). See further notes under *arbutifolia*.

HAB 12,9,6 B 4. **ABU** g8 s8 -2.

0771--*Pyracantha coccinea* M. Roem. ? C

Rosaceae <Pomeae>: *Pyracantha* [Cotoneaster] cf. *coccinea* (C. *pyracantha*)

This species from southeast Europe is the most commonly cultivated member of the genus in North America. Although escapes have been widely reported across southern and coastal states, it does not appear to have become invasive

north of the Gulf Coastal Plain (K, SE). For Ky. there is only an old obscure report by Linney (1882).

P. crenulata (D. Don) M. Roem, from the Himalayas, is another commonly planted species. It was recently reported from TAYL (CW), and needs to be assessed for potential naturalization as well.

ALI EU.

0772--*Cotoneaster divaricatus* Rehd. ex Wilson C

Rosaceae <Pomeae>: *Cotoneaster divaricatus*

This widely planted species does not seem to have become generally naturalized in eastern states. There is coll. from PEND (KNK) of an apparently self-seeded plant, which was erroneously referred to *C. apiculatus* Rehd. & Wilson in some previous listings of the Ky. flora. P. Zika (pers. comm.) provided the correct determination.

ALI AS.

0773--*Crataegus phaenopyrum* (L. f.) Medik.

Rosaceae <Pomeae>: *Crataegus* <Cordatae> *phaenopyrum*

This distinctive species has been widely planted (as "Washington thorn") and it occasionally spreads by seed; only apparent wild records are mapped here. It is native from the mid-Atlantic region to the Blue Ridge, and some records further west may be from introductions (D, W; Lance 2006). However, Phipps (1998) and others (F, St) have indicated a broader native range, including the Ozark region and southern Interior Low Plateaus. It appears to be native in Butler Co., Ohio (D. Boone, pers. comm.).

Some colls. from w. Ky. suggest native status: e.g. from CALD ("rocky hillsides") and CHRI ("along small streams") at GH. Moreover, the clustering of records in this relatively undeveloped western region supports native status. Much more planting has occurred in more populated regions to the northeast, where escapes have sometimes been found in recent decades (e.g. as mapped with open dots in FAYE and MADI).

ALI e. HAB f-8,7,10 C? 4. ABU +4.

0774--*Crataegus marshallii* Egglest.

Rosaceae <Pomeae>: *Crataegus* <Microcarpae> *marshallii*

This southeastern species is known from only two colls., in CALL (MUR) and MCRA (JC fo KY); both were from rights-of-way. These are about the most northern records in the Mississippi Valley (Phipps 1998; PL).

HAB f-6,9,8,10 D? 4. ABU g9 s2 -3?

0775--*Crataegus spathulata* Michx.

Rosaceae <Pomeae>: *Crataegus* <Microcarpae> *spathulata*

This southeastern species is known only from a coll. in TRIG (APSU), which is about the most northern record in the Mississippi Valley (Phipps 1998; PL).

HAB f-10,8,9,6 D? 5. ABU g8 s2 -3?

0776--*Crataegus monogyna* Jacq. C

Rosaceae <Pomeae>: *Crataegus* <Oxyacanthae> *monogyna*

There are colls. from BATH and FAYE (KY) that appear to be from self-seeded plants, but this occasionally cultivated European species does not seem to have become truly naturalized in Ky. The coll. from FAYE may be hybridized with *phaenopyrum* (Phipps 1990).

ALI EU.

0777--*Crataegus uniflora* Muenchh.

Rosaceae <Pomeae>: *Crataegus* <Parvifoliae> *uniflora*

This is a widely scattered southeastern species, generally associated with thin woods on sandy soils. It is generally uncommon to rare in Ky. and Tenn., and largely restricted to Appalachian regions or nearby.

HAB 12,11,10,8 C? 4. ABU g8 s7 -2.

0778--*Crataegus crus-galli* L.

Rosaceae <Pomeae>: *Crataegus* <Crus-galli> *crus-galli* (*armata*, *wilkinsonii*)

Several segregates of this widespread, variable eastern species have been described, but their treatment remains uncertain. The map includes early records of *C. armata* Beadle (CAMP), *C. wilkinsonii* Ashe (BOON), and other names that are generally considered synonyms in some recent treatments (Cr, M).

Although *crus-galli* has been widely recorded in Ky., like several other hawthorns it has declined due to the abandonment or conversion of rougher rocky pastures and invasion of *Juniperus virginiana*. Extensive colonies, as still exist in some other states (Lance 2006; D. Boone, pers. comm.), are now virtually unknown in Ky. "Hot-spots" with this and other *Crataegus* species may indicate where open woodland occurred before settlement, or where rough pasturing continued after settlement.

HAB f-10,8 D 4. ABU g10? s9 -2.

0779--Crataegus persimilis Sarg. ?

Rosaceae <Pomeae>: *Crataegus* <Crus-galli> cf. *persimilis* (?palmeri, ?regalis, ?denaria)

Mapping here is provisional. These are miscellaneous records of broad-leaved variants within Series *Crus-galli* that are grouped here, pending further revision.

A coll. from MONT (GH) is named *C. persimilis* Sarg. (verified by J.B. Phipps), which may be a distinct midwestern segregate (including *C. hannibalensis* Sarg.), perhaps transitional from *crus-gallii* to *calpodendron* (F).

Sources for these records are colls. at various herbaria (GH, MICH, MO); see also Slack (1941; check Cornell) and Wharton (1945). Included are records of *C. palmeri* Sarg. (CLAR), *C. regalis* Beadle (ESTI, LYON, MCRA), and *C. denaria* Beadle (LYON, JEFF, MCRA; see also *C. acutifolia* Sarg. in D, perhaps transitional to *C. viridis*). Some plants may be derived from hybridization (D, F). These taxa are mostly distributed in midwestern regions, especially Ind., Ill., Iowa, Kans., Mo. and Ark., but with eastern records from N.Y., N.C. and Ky. (D, F).

HAB f-10,8 C 4. **ABU** g10? s8 -2.

0780--Crataegus engelmannii Sarg.

Rosaceae <Pomeae>: *Crataegus* <Crus-galli> *engelmannii* (*berberifolia* var. e.)

This largely midwestern taxon may be reasonably treated as *C. berberifolia* Torr. & Gray var. *engelmannii* (Sarg.) Eggles., according to G. Yatskievitch & J.B. Phipps (pers. comm.). Typical *berberifolia* is more southwestern and unknown in Ky. (F). Both are close to *crus-gallii* but more hairy; further review is needed. Relatively broad-leaved variants can be expected in damp or shady habitats, as in *crus-galli* (F, St).

HAB f-10,12,8 C? 4. **ABU** g8? s7? -2.

0781--Crataegus viridis L.

Rosaceae <Pomeae>: *Crataegus* <Virides> *viridis* (interior)

This is widely distributed on lowlands of southeastern states. Possible varieties and hybrids deserve further study (Sargent 1905, 1922; Britton & Brown 1913; F, St). Typical *viridis* has oblong-ovate leaves with moderately lobing, and bright red fruit. The midwestern var. *ovata* (Sarg.) Palmer (with unlobed or shallow-lobed ovate leaves and yellow-red fruit) was reported from w. Ky. in Britton & Brown (1913); it has been recently treated as a species by USDA (PL). A coll. from BALL (KY) with more deeply serrated

or lobed leaves may be referable to var. *lutescens* Palmer ex Gleason. (but see also var. *interior* (Beadle) Palmer). A coll. from MCRA (check MO) with bright yellow fruits was named forma *padukensis* Palmer & Pickens. Var. *lanceolata* (Sarg.) E.J. Palmer is known from w. Tenn.

Some cultivated plants have been referred to the closely related *C. nitida* (Engelm.) Sarg., with relatively thick glossy leaves, larger flowers and larger fruit (F, St), suggesting hybridization with *Crus-gallii* or *Punctatae* (especially in plants with leaves relatively broad and somewhat glaucous below). *C. X nitida* reportedly originates from Ill., Mo. and Ark., but it appears to have become widely grown under the names *nitida* or *viridis* ("Winter King") in eastern states (PL; Dirr 1997; see images at mobot.org/gardeninghelp/). Such trees have been widely planted in urban landscapes of c. Ky.

HAB 6,9,7,10 D 3. **ABU** g8 s8 -3.

0782--Crataegus punctata Jacq.

Rosaceae <Pomeae>: *Crataegus* <Punctatae> *punctata*

This appears to be rare in Ky. but it is close to *collina*, with more records, and the separation here is tentative; see also B. In its narrow sense (D, F), *punctata* is a complex northeastern taxon, with Appalachian extensions mostly at higher elevations (HFG, W).

C. punctata may be distinguished from *collina* by its fresh mature fruit usually 12-22 mm wide (versus 8-12 mm), completely glabrous including the calyx (versus pubescent and persistently so on the calyx); flowers usually with 20 stamens (versus 10-15); leaves of flowering branches usually 3.5-5 x 2-3 cm (versus 2-3 x 1.5-2 cm); leaves of vegetative branches mostly obovate, deeply cut or with narrow spreading lateral lobes near apex (versus mostly elliptic, not deeply cut but sometimes slightly lobed); and twigs ashy gray (versus dark). Plants with more hairy twigs and leaves, centered in the northern Ohio Valley, have been called var. *canescens* Britt. (Gl, F).

HAB f-8,7,10? C? 4. **ABU** g9 s4? -3.

0783--Crataegus collina Chapman

Rosaceae <Pomeae>: *Crataegus* <Punctatae> *collina* (*succincta*, ?*collicola*, ?*verruculosa*)

This is close to *punctata*, with occasional intermediates, but it has continued to be distinguished by some authors (D, F, W; Lance 2006; J.B. Phipps, in prep.). *C. collina* occurs mostly in east-central states, especially in calcareous regions. Tentatively included here is *C. colina* var. *collicola* (Ashe) Palmer

(?= *C. disperma* Ashe), which may represent introgressants with *crus-gallii*. Var. *collicola* has been reported from Ky. (F, M); but see note under *C. aff. incaedua*.

The closely related Ozarkian taxon, *C. verruculosa* Sarg., has been reported from Ky. (F, Gl, M), but it may just represent a transition from *collina* to *punctata*. It differs from *collina* in its larger fruit (usually 10-13 mm versus 8-12 mm wide), larger flowers (ca. 1.8-2.3 cm versus 1.5-2 cm wide), with ca. 20 stamens (versus usually 10-15), in larger clusters (?); and vegetative leaves more coarsely toothed, with 2-3 pairs of small lateral lobes (versus finely serrate, usually unlobed). The closely related *C. kellermannii* Sarg. (=? *C. suborbiculata* Sarg.) has also been identified in the state (Palmer #23681 at MO); it may represent a hybrid with *pruinosa* (F).

HAB f-8,7,10? D? 4. **ABU** g8 s6? -3.

0784--*Crataegus incaedua* Sarg. ?

Rosaceae <Pomeae>: *Crataegus* <Punctatae> cf. *incaedua* (?*collina/punctata* x *calpodendron/crus-galli*)

Mapping here is provisional. These colls. are difficult to identify and somewhat varied, including possible hybrids (D, F). *C. incaedua*, with apparent colls. from HART and HOPK (KY), may be derived from *collina* and *calpodendron*. The colls. from CALL (MUR) and WHIT (GH) have been referred to *C. disperma* Ashe, which may be derived from *collina* or *punctata* (as one parent) and *crus-galli* (as the other). The coll. from KENT (PH) was initially determined as *C. pratensis* Sarg. (but see also *C. peoriensis* Sarg.). These taxa are mostly poorly understood, with scattered distributions centered in midwestern regions.

HAB f-8,7,10? D? 4. **ABU** g7? s6? -3?

0785--*Crataegus intricata* Lange

Rosaceae <Pomeae>: *Crataegus* <Intricatae> *intricata* (*straminea*, *neobushii*, ?*buckleyi*, ?*biltmoreana*)

This variable species is widely distributed on acid soils in Appalachian and northeastern regions. Included here are records of *C. neobushii* Sarg. (a potential western segregate with small fruits and pinkish anthers), *C. straminea* Beadle (with yellowish fruit and pinkish anthers), *C. buckleyi* Beadle (Cr, M), and *C. biltmoreana* Beadle (= *C. intricata* of Egglest. non Lange). The latter is a pubescent form (supposedly with more foliaceous bracts) that has been recently treated as a variety of *intricata* by Lance (2006,

2011; see also W). It is widely reported in more eastern states, but not yet determined in Ky. except perhaps for a recent coll. from NICH (JC for KY).

HAB 10,8,12,11 C 4. **ABU** g9 s8 -3.

0786--*Crataegus boyntonii* Beadle

Rosaceae <Pomeae>: *Crataegus* <Intricatae> *boyntonii* (*intricata* var. b.)

This is combined with *intricata* by some authors. It is a less lobed variant with a largely Appalachian range.

HAB 10,8,12,11 B? 4. **ABU** g8? s8? -3.

0787--*Crataegus rubella* Beadle

Rosaceae <Pomeae>: *Crataegus* <Intricatae> *rubella* (*intricata* var. r.)

This is combined with *intricata* by some authors, but it may be a relatively distinct segregate with narrower leaf bases and fewer lobes. It is largely restricted to central and southern Appalachian regions, but also reported from the Knobs of s. Ind. (D).

HAB 10,8,12,11 B? 4. **ABU** g8? s7? -3.

0788--*Crataegus chrysocarpa* Ashe ?

Rosaceae <Pomeae>: *Crataegus* <Rotundifoliae> aff. *chrysocarpa* (?*mercerensis*, ?*margaretta*, ?*sicca*)

These colls. are difficult to identify, and may include closely related species like *C. margaretta* Ashe (of north-central states) and *C. sicca* Sarg. (mostly in Mo.). The coll. from MCRE (at least) may be referable to *C. mercerensis* Sarg., which has been considered an Appalachian variety of *C. chrysocarpa* (W). Typical *chrysocarpa* is a northern and western species that may not occur in the state (see also SC).

HAB 8,10? B? 4. **ABU** g8? s7? -3.

0789--*Crataegus flabellata* (Spach) Kirchn. T

Rosaceae <Pomeae>: *Crataegus* <Tenuifoliae> *flabellata*

This name has been applied in Ky. (e.g. Clark & Bauer 2001; see also M), but no known colls. can be identified as *flabellata* in its original narrow sense (F, Gl). In that sense, it has a northern range and extends down the southern Appalachians only at higher elevations, seeming unlikely in Ky. (HFG, W). The few records are provisionally referable to *macrosperma*, which has been combined with several other species into a much broader concept of *flabellata* by Cr and others. *C. flabellata* has been distinguished primarily by its "flowering corymbs more or less villous," versus glabrous in *macrosperma* (Gl). Further research is needed, using the full range of potential characters.

0790--Crataegus macrosperma Ashe

Rosaceae <Pomeae>: *Crataegus* <Tenuifoliae> *macrosperma* ("flabellata")
 This is a widespread variable northeastern species, but it appears to be uncommon in Ky. See also notes under *flabellata* and *iracunda*, which have records that are not yet reliably segregated from *macrosperma* in Ky. Most of the uncertain records mapped here as open dots may be transferred to *iracunda*. Some records from BOYD and LYON (GH) are based on atypical colls. with suborbicular leaves, which also suggest *collina*.

HAB 8,7,10,12 B 4. **ABU** g9? s5? -2?

0791--Crataegus iracunda Beadle

Rosaceae <Pomeae>: *Crataegus* <Silvicolae> *iracunda* (*silvicola*, *populnea*, *brumalis*, *macrosperma* var. *demissa*)
 Variation needs further study, and distinction from *macrosperma* remains unclear in some records. Based on F, Gl, SC, W, Lance (2006), A. Haynes (pers. comm.) and provisional examination of material (including GH, MO & NY), *iracunda* differs in its smaller or less succulent fruits; its leaves short-hairy to glabrate above when young (versus scabrate), more deltoid in gross outline (versus ovate), firm to "subcoriaceous" and more bluish; its leaf lobes not distinctly acuminate and outwardly bent ("reflexed") as in *macrosperma*; and its spines usually smaller.

C. iracunda (and other taxa in *Silvicolae*) may be transitional between *macrosperma* (or its allies) and *pruinosa* (or its allies). Variety status has been suggested, with *C. macrosperma* var. *demissa* (Sarg.) Eggl. a potential name, but some 33 synonyms are provisionally included at GH. *C. iracunda* was originally known only from southeastern states, especially in low flat woodlands. But its definition can be reasonably extended to include more robust northeastern and Appalachian plants (Gl, F, HFG), with leaves relatively broad (*C. silvicola* Beadle) or more coarsely lobed (*C. brumalis* Ashe).

HAB 8,7,10 B 4. **ABU** g9? s8? -2.

0792--Crataegus pruinosa (Wendl. f.) K. Koch

Rosaceae <Pomeae>: *Crataegus* <Pruinosae> *pruinosa* (*mackenzii*, ?*rugosa*, ?*compacta*)
 The mapped records include *C. mackenzii* Sarg. (with broader leaf bases), *C. rugosa* Ashe (with even broader leaves) and *C. compacta* Sarg., which have not been clearly distinguished in Ky. and are generally included in recent

treatments (Cr, M). *C. locuples* Sarg., a probable hybrid with *mollis*, has also been reported (F; see also *C. platycarpa* Sarg. in D and St). There may also be hybrids with *Punctatae*. *C. gattingeri* has also been combined in some treatments; but see notes under that name.

HAB 8,10,12,1 C 5. **ABU** g9 s8? -2.

0793--Crataegus gattingeri Ashe

Rosaceae <Pomeae>: *Crataegus* <Pruinosae> *gattingeri* (+ var. *rigida*)
 This is close to *pruinosa*, and some colls. deserve further study; Lance (2011) treated it as a variety. However, J.B. Phipps (dets. at GH and MO) has maintained *gattingeri* as a distinct species, distinguished by its smaller fruit (up to 9-10 mm wide versus 12-16 mm), smaller flowers (1.2-1.7 cm wide versus 1.7-2.2 cm), thinner leaves and more pronounced leaf lobing, the terminal lobe usually conspicuously elongated (D, F, Gl, SC). It is distributed largely in the Ohio Valley (and perhaps the central Mississippi Valley), whereas typical *pruinosa* is more widespread in north-central regions, but there is much overlap in range.

HAB 8,10? C? 4. **ABU** g8? s7? -3.

0794--Crataegus coccinea L. ?

Rosaceae <Pomeae>: *Crataegus* <Coccinieae> aff. *coccinea* (?*pedicillata*, ?*pennsylvanica*, ?*putnamiana*)
 Mapping here is provisional. There has been confusion or combination of *coccinea* with *pruinosa* and several other species in Ky. (M) and Tenn. (Ch). In a broad sense, *coccinea* is widespread across northern regions of eastern North America. However, this name has only been regularly applied in Ky. after 2000 (e.g. Clark & Bauer 2001; Thompson & Fitzgerald 2003; Weckman et al. 2003; Abbott et al. 2004; CW). *C. coccinea* and its segregates are reportedly rare in N.C. and Va. (W), but more widespread in W.Va. (HFG).

In Ky., the coll. from HARL (GH) is verified as typical *coccinea*, but some other colls. appear distinct. More western colls. may be referable to *C. putnamiana* Sarg., which is a segregate reportedly centered in the lower Ohio Valley, including Ky. (D, F, Gl, M); that taxon has relatively broad-based leaves and large fruit, and may be transitional to Series *Rotundifoliae*. Other possible segregates are suggested or expected in Ky. (M), but need further assessment: *C. pennsylvanica* Sarg. (mostly in northern Appalachian regions) and *C. pedicillata* Sarg. (mostly in the Great Lakes region but also reported widely in W.Va. by HFG).

HAB 8,10? C? 4. **ABU** g9? s8? -3?

0795--Crataegus coccinioides Ashe R

Rosaceae <Pomeae>: Crataegus <Dilatatae> coccinioides

This midwestern species is not confirmed in Ky. There is a coll. with this name that needs further study, from BOYD (GH): T.N. McCoy, 7 Sep 1936, "Reservoir Hill". There are confirmed colls. from s. Ill. (MO), but not Ind. (D).

0796--Crataegus mollis Scheele

Rosaceae <Pomeae>: Crataegus <Molles> mollis (cibaria, ?cibilis)

This widespread eastern species is locally common on fertile floodplains and calcareous uplands, but it is much less common in most Appalachian regions (see also HFG). There is a loose association with Quercus macrocarpa and other species of browsed eutrophic woodlands.

Hybrids may be expected with pruinosa, punctata, collina, margaretta and other species (D, F, St; Lance 2006). Some colls. from LYON and TRIG (APSU) are atypical, with leaves more gradually narrowed at the base (versus truncate), less hairy on lower surfaces, and paler olive-green (versus bluish-green); they resemble the more northern segregate, C. submollis Sarg. (F), and have been misidentified locally as C. calpodendron. They may result from hybridization with of mollis with calpodendron or a similar species.

Mapped records here tentatively include colls. of the closely related taxa described as C. cibaria Beadle and C. cibilis Ashe, which have more cuneate leaf bases and come from more eastern regions of the state, mostly along the Ohio Rv. and its major tributaries: BRAC, GRNP, LAWR, LETC and MASO (B, Cr, M).

HAB f-8,10,7,4 E? 4. **ABU** g9 s9 -3.

0797--Crataegus calpodendron (Ehrh.) Medik.

Rosaceae <Pomeae>: Crataegus <Macracanthae> calpodendron (pubiflora, ?tomentosa)

Several variants have been described from other states, but these need further assessment (D, F, Gl, St, M, Lance 2006). Also, hybrids are possible with collina, crus-gallii or related species.

HAB 4,7,1 D? 4. **ABU** g8 s8 -2.

0798--Crataegus succulenta Schrad. ex Link

Rosaceae <Pomeae>: Crataegus <Macracanthae> succulenta (macrantha var. s.)

This northern species has been rarely reported from Ky. (M). Verified colls. (det. by J.B. Phipps) are known only from BATH (GH: Horsey #1781, Olympia) and OLDH (DHL: H. Woodward #2999, field on Old Zaring Rd. to the Univ. of Louisville Farm).

HAB 4,7? C? 4. **ABU** g8 s1 -3?

0799--Amelanchier intermedia Spach T

Rosaceae <Pomeae>: Amelanchier intermedia (X intermedia)

This has often been interpreted as a hybrid between canadensis and arborea (K), but FNA (in prep.) and W have recently treated it as a distinct northeastern species. It resembles canadensis in its relatively small flowers (6-12 mm versus 10-20 mm in arborea) on erect racemes (versus drooping), but differs in its leaves at flowering more expanded, reddish and glabrescent (suggesting laevis). E.J. Palmer applied the name intermedia to a coll. of B from BOON (US!): E.L. Braun #857, 3 Apr 1935, Woolper Cr., field on terrace. This identification is consistent with FNA, but further assessment is desirable.

0800--Amelanchier arborea (Michx. f.) Fern.

Rosaceae <Pomeae>: Amelanchier arborea ("canadensis"; alabamensis)

This is a widespread eastern species. The name A. canadensis (L.) Medik has been misapplied to arborea in older treatments, causing continued confusion in academia and horticulture. Typical canadensis is a more shrubby species, with narrower leaves and more ascending racemes of relatively small flowers (F). It occurs in wetlands from northeastern regions to the Coastal Plain of Ga., and it has been reported on the Cumberland Plateau in Tenn. (Ch; D. Estes, pers. comm.). Although canadensis or its hybrids may sometimes be planted, there is no evidence that it is native or naturalized in Ky. But see note under intermedia.

HAB 11,12,7 C 3. **ABU** g10 s10 -2.

0801--Amelanchier laevis Wieg.

Rosaceae <Pomeae>: Amelanchier laevis (arborea var. l.)

This is a northeastern species, extending south along the Appalachians. Some material is difficult to distinguish from arborea; there may be introgression in some regions. It is reported (F, Cr) to flower a little earlier, with leaves already about half-grown (versus usually much less than half); leaves are glabrous or nearly so (versus tomentose at least when young), deeper green

"with a prominent coppery-red cast that disappears before maturity"; fruits become relatively dark and juicy, on pedicels up to 2.5-5 cm (versus mostly 1-2 cm). Large distinct populations may not be well-developed in Ky., in contrast to higher elevations of the Southern Appalachians, where trees can reach 10-15 m tall.

HAB 11,7,5 C 3. **ABU** g9 s7? -1.

0802--Amelanchier sanguinea (Pursh) DC.

Rosaceae <Pomeae>: *Amelanchier sanguinea*

This is a largely northeastern species that occurs south along the higher Appalachians to Ga. In Tenn., it is also scattered along banks of the Obed Rv. and elsewhere on the Cumberland Plateau (Ch; D. Estes, pers. comm.). It was recently found by JC (for KY) in BELL at the crest of Pine Mt. on the Golden tract (later transferred to the Ky. Div. of Forestry), and J. Kiser (pers. comm.) collected it (for EKY) from LETC, in a sandstone glade on the Pine Mt. Wildlife Management Area. Wiegand's (1912) report from Ky. of the hybrid between *A. humilis* Wieg. and *A. laevis* is also notable; *humilis* is closely related to *sanguinea* and sometimes included.

HAB 12,11,1? +\ B? 4. **ABU** g9 s2 =.

0803--Amelanchier spicata (Lam.) K. Koch

Rosaceae <Pomeae>: *Amelanchier spicata* (stolonifera)

This northeastern species was found by JC at the northwest end of the knob north of Ravenna (ESTI), together with *Paxistima canbyi* (Campbell et al. 1989). The gross morphology and range of *spicata* are similar to *sanguinea*, which is generally a smaller shrub more restricted to xeric open sites. The correct name for this species has been uncertain until the recent revision for FNA (in prep.; see also W).

HAB 12 +\ D? 4. **ABU** g9 s2 =.

0804--Berchemia scandens (Hill) K. Koch

Rhamnaceae: *Berchemia scandens*

This is a tall vine typical of lowlands in southeastern states. It is much more common south of Ky. and Tenn., often spreading onto relatively dry uplands.

HAB 6,4,8,7 D 4. **ABU** g9 s2 -2.

0805--Ceanothus americanus L.

Rhamnaceae: *Ceanothus americanus*

Segregates within this widespread eastern species need more study. Most colls. from Ky are referable to var. *americanus*, but there may be at least transitions to other varieties.

Some of B's colls. from FLEM (check US) and GRAV (GH) have been identified as var. *intermedius* (Pursh) K. Koch., which is known primarily from the southeastern Coastal Plain and may be unlikely in Ky. That variety generally has smaller leaves (ca. 2-4 x 1-2 cm versus 4-10 x 2.5-6 cm) and other differences (F, W). Var. *intermedius* is probably synonymous with *C. glomeratus* of Rafinesque (1836, 3:55): "in Virginia, Carolina, Alabama, Kentucky &c commonly blended with [*americanus*]."

A coll. of R. Athey (check EKY) from LIVI has been identified as var. *pitcheri* Torr. & Gray, which is known primarily from the central Mississippi Valley and adjacent hills; its leaves are generally blunt or rounded (versus acute or acuminate) and pilose above (versus glabrous). Var. *pitcheri* is probably synonymous with *C. latifolius* of Rafinesque (1836, 3:55): in "Glades of West Kentucky and Tennessee."

HAB f-10,7,11 C 4. **ABU** g10 s9 -3.

0806--Ceanothus herbaceus Raf.

Rhamnaceae: *Ceanothus herbaceus*

This occurs mostly in the Great Plains, but has disjunct plants in northeastern states, as far as D.C. to N.H., associated with rocky riverbanks and rocky glades (Bartgis et al. 1997; W). In Ky. it is known from small patches on both sides of the Rockcastle Rv. in LAUR (MM for WKY) and PULA (KY); it has also been collected on banks of the Little South Fork of Cumberland Rv. in WAYN (KY). There is an unverified record of KSNPC from LYON. Presence in Tenn. remains uncertain (Ch; D. Estes, pers. comm.).

HAB 1 C 5. **ABU** g10 s3 =.

0807--Frangula alnus P. Mill. C

Rhamnaceae: *Frangula* [*Rhamnus**] *alnus* (*R. frangula*)

There are colls. from JEFF (KNK), LAUR (BEREA) and MADI (CW), but the contexts are unclear. They need checking to see if truly naturalized, as opposed to planted. *F. alnus* is widely naturalized in more northern states and adjacent Canada, but remains virtually unknown as an escape in southeastern states (K, PL, SE, W).

ALI EU. **HAB** 9,6 C? 4.

0808--*Frangula caroliniana* (Walt.) Gray var. *caroliniana*

Rhamnaceae: *Frangula* [*Rhamnus**] *caroliniana* var. *c.* (*R. caroliniana*)

This species is widespread across southeastern states, but it is common only on base-rich soils. Var. *caroliniana* may be concentrated east of the Mississippi Rv., while var. *mollis* is predominant to the west. Deeper analysis is needed to assess the taxonomic significance of this pattern.

HAB f-12,8,7 D 4. **ABU** g9 s8 -3.

0809--*Frangula caroliniana* (Walt.) Gray var. *mollis* (Fern.) new comb.

Rhamnaceae: *Frangula* [*Rhamnus**] *caroliniana* var. *mollis* (*R. caroliniana* var. *m.*)

See notes under var. *caroliniana*.

HAB f-12? D 4. **ABU** g9 s9 -3.

0810--*Rhamnus lanceolata* Pursh

Rhamnaceae: *Rhamnus lanceolata*

In Ky. this largely midwestern species is known only from the Bluegrass region, within limestone ravines along the Kentucky Rv. and at scattered sites near the Ohio Rv. Previous reports from EDMO (DHL) were based on a misidentified coll. of *Ilex decidua*. Colls. from JEFF (MM for WKY), PEND (KNK in part), FAYE (KY in part) and perhaps elsewhere are referable to var. *glabrata* Gleason. Typical *lanceolata* may be largely Appalachian (W), but further study is needed.

HAB 11,12 E 3. **ABU** g8 s8 -1.

0811--*Rhamnus cathartica* L.

Rhamnaceae: *Rhamnus cathartica*

This has become a locally abundant invader across much of northern North America, but it remains virtually unknown in southern states (K, PL, SE). In Ky. it has been planted in some residential areas since 1960 or earlier, but there has been little naturalization. There has been some confusion with *davurica*; see notes under that name (also W). *R. cathartica* can hybridize with some other introduced species of *Rhamnus* (Gil-Ad & Reznicek 1997).

ALI EU. **HAB** 12,8 E 4. **ABU** +4*.

0812--*Rhamnus davurica* Pallas

Rhamnaceae: *Rhamnus davurica* (*citrifolia*, "dahuricus")

This often overlooked shrub from northeast Asia has become locally abundant in some rural localities of the Bluegrass region, especially in hills along the

lower Kentucky Rv. It has sometimes been confused with *cathartica*, and hybrids are suspected in the parks of JEFF.

ALI AS. **HAB** f-8,7 E 3. **ABU** +4*.

0813--*Elaeagnus pungens* Thunb. W

Elaeagnaceae: *Elaeagnus pungens*

This evergreen scrambling thorny shrub, with flowers in fall and reddish fruit in spring, is scattered over warmer regions of southeastern states (PL, W). In Ky. it has been planted at several sites, but there is only one record of a self-sown plant: by MM (for WKY) from JEFF in 1987 (M).

ALI AS. **HAB** f-10,8 C? 4. **ABU** +4.

0814--*Elaeagnus multiflora* Thunb. W

Elaeagnaceae: *Elaeagnus multiflora*

This shrub ("cherry silverberry") is closely related to *umbellata* but differs in its larger fruit, longer pedicels, shorter hypanthium, and perhaps larger leaves. It has occasionally been planted in Ky. after 1970 for so-called reclamation or "wildlife" (with even human use of its fruits), especially in Appalachian regions, but there is no certain record of self-sown plants (M). Naturalized populations have been reported from scattered sites in Tenn. (D. Estes, pers. comm.) and other eastern states (PL).

ALI AS.

0815--*Elaeagnus umbellata* Thunb.

Elaeagnaceae: *Elaeagnus umbellata*

This has been widely planted across North America (as "autumn olive"), especially for reclamation on mines or supposed benefits to wildlife, and it is now a problematic invasive alien in eastern states. In Ky. all records date from after 1970. Most or all plants may be referable to var. *parvifolia* (Royle) Schneid., but further taxonomic study of the genus in North America is needed.

ALI AS. **HAB** f-8,10,7? C? 4. **ABU** +5*.

0816--*Elaeagnus angustifolia* L.

Elaeagnaceae: *Elaeagnus angustifolia*

This small tree (known as "Russian olive") has been planted for "wildlife" and "reclamation" across North America for several decades. It is now locally invasive in western states, but does not appear to have become as widely naturalized in eastern states (Ch, PL, W, Y). The few Ky. records date from after 1970. *E. angustifolia* has distinctly narrow leaves (l/w ca. 3-8) and sharp

thorny branches. Several records of K need further verification, and are mapped here with open dots.

A related species, *E. commutata* Bernh., is native in northwestern North America, and its report from Ky. by BA was probably based on misidentified *angustifolia* (M). Both species have yellow fruits and persistently silvery-lepidote leaves. In contrast, *umbellata* and *multiflora* have red fruits; their leaves are soon green and glabrescent above; they have shorter shrubby growth and less developed thorns.

ALI EU. **HAB** f-10,8 D? 4. **ABU** +4.

0817--*Ulmus rubra* Muhl.

Ulmaceae: *Ulmus rubra* (fulva)

This widespread eastern tree has often been confused in vegetative specimens with *americana* and other species, but there are several differences that deserve more attention (F, St, FNA 3, J, W). Leaves of *rubra* can generally be distinguished by their relatively large size (mostly 10-20 cm long versus 5-15 cm), somewhat obovate with a more abruptly acuminate apex, marginally ciliate and with longer hairs on upper surfaces (up to ca. 1 mm versus 0.5 mm, like a 24 hour beard versus 12 hour).

The closely related European species, *U. glabra* Huds. and *U. procera* Salisb., have occasionally been planted, and then often confused with *rubra* given inadequate keys in some North American treatments.

HAB 5,7,4,11 D 2. **ABU** g10 s10 -3.

0818--*Ulmus procera* Salisb. R

Ulmaceae: *Ulmus procera* ("campestris"; minor var. *vulgaris*)

This may be reasonably treated as a variant of *U. minor* Mill., which is a widespread complex species in southern Europe (FNA 3). *U. procera* is often called "English elm" but it is a generally sterile clone that originates from southeast Europe (Gil et al. 2004). It has been planted across much of North America, with local escapes reported mostly from northeastern regions (PL). In Ky. J noted that this tree can occasionally escape, but supporting colls. remain unknown. The large tree in front of the old Agriculture Experiment Station on the Univ. of Ky. campus has been mislabeled as *rubra* for 30 years (despite the error being pointed out more than once).

ALI EU.

0819--*Ulmus pumila* L.

Ulmaceae: *Ulmus pumila*

This widely planted tree ("Siberian elm") was first recorded as an escape in Ky. by Ellis et al. (1971; APSU). The colls. mapped here appear to be from self-seeded plants, based on label data. Most data come from CW, who indicated that this species is becoming widely naturalized.

ALI AS. **HAB** f-7,8? D? 3? **ABU** +4.

0820--*Ulmus parvifolia* Jacq.

Ulmaceae: *Ulmus parvifolia* (*chinensis*)

This tree ("Chinese elm") has been widely planted across temperate North America, and it has occasionally escaped (PL). The records mapped here appear to be from self-seeded plants, but it is not clear if the species will become truly naturalized outside urban environments. *U. parvifolia* is sometimes confused with *pumila*. Well-developed leaves on mature trees are generally narrower (ca. 1.5-2.5 cm versus 2-3.5 cm), with more asymmetrically oblique bases and more forked veins (5-9 per side versus 1-3). Bark is distinctly platey (versus furrowed). Flowering usually occurs in Aug-Oct (versus Feb-Apr).

ALI AS. **HAB** f-7,8? D? 3? **ABU** +4.

0821--*Ulmus americana* L.

Ulmaceae: *Ulmus* <*Oreoptelea*> *americana*

This is widespread across eastern and central North America, especially on seasonally damp, fertile soils. Although much reduced by Dutch Elm Disease, mature trees are still widely scattered across Ky., with locally abundant regeneration from seed. The species, broadly defined, varies greatly in leaf size, shape and pubescence, and there has been much misidentification of vegetative material; see notes under other species. Across its range, *americana* is mostly tetraploid and hybrids with other species are unknown; $2n = 56$, versus 28 in all other elms of N. America. But Whittmore & Olson (2011) have recently shown that many southeastern plants are diploids, with concentrations on or near the Cumberland Plateau and Atlantic Coastal Plain; their research is ongoing.

Rafinesque (1836, 3:38-39) described a series of three segregates, with increasing tree size and leaf roughness: *obovata*, *alba* and *americana*. Upper leaf surfaces are indeed often scabrous to short-hairy (especially on vigorous young growth), not just glabrous as sometimes stated (FNA 3, initial printing; W). Plants on drier uplands in Ky. and Tenn. usually have relatively small, rough leaves and slightly corky branches; these may also be referable to var.

aspera Chapm. (described from Fla. in 1860). Such leaves can be distinguished from *alata* by their relatively broad shape, with more asymmetric base and more acuminate apex.

HAB 6,4,7 D 2. **ABU** g10 s10 -2.

0822--*Ulmus thomasi* Sarg.

Ulmaceae: *Ulmus* <*Oreoptelea*> *thomasi* (*racemosa*)

This northern "rock elm" has a somewhat fragmented range from New England to the midwest, and is largely restricted to base-rich soils. There has been confusion in Ky., Tenn. and elsewhere with *serotina* or other species. All previously published records from Tenn. (Little 1971, FNA 3, Ch) are erroneous (B.E. Wofford, pers. comm.). In Ky. further verification is needed in several counties, and some disjunct southern records are tentatively transferred to *serotina*; see notes under *serotina*. There are relatively few flowering or fruiting colls. of *thomasi* (Mar-May) and *serotina* (Aug-Nov), in contrast to the other native elms (Feb-Apr).

Compared to *americana*, leaf blades of both *thomasi* and *serotina* tend to be broader in shape (l/w mostly 1.7-2.2 versus 2-2.5) and more obovate (versus ovate), with a more abruptly attenuate to acuminate apex (versus more gradually tapering from near the middle), and uniform soft-hairy on lower surfaces (versus hairy to glabrate but with distinctive tufts in axils). Leaves of *thomasi* have distinctly broad shape, close secondary veins (mostly 3-5 mm apart versus 5-7 mm), well-marked pale tertiary veins (versus less distinct from ultimate areolae), upper surfaces usually smooth and glossy. Although irregular corky wings occur on branches of *thomasi* and *serotina*, *americana* can also become somewhat corky, especially on drier sites.

HAB 11,5,12 + E 2. **ABU** g8 s7 =.

0823--*Ulmus serotina* Sarg.

Ulmaceae: *Ulmus* <*Oreoptelea*> *serotina*

This southern "rock-elm" (or "September elm") is largely restricted to dry calcareous sites of the Ozark region, southern Interior Low Plateaus and Gulf Coastal Plain (PL). There has been frequent confusion in vegetative colls. with other species, especially *thomasi*. Also, B's records of *serotina* from BREA, MADI & PIKE were based on misidentified *americana* (GH, US).

Compared to *thomasi* (F, FNA 3, W), well-developed leaves at the ends of shoots tend to be smaller (mostly 6-9 cm long versus 8-12 cm) and narrower in shape, often with a more asymmetric base; surfaces are dull yellowish-

green above (versus glossy dark green), and covered with soft yellowish hairs below (versus white); veins are fewer on each side (ca. 15-18 versus 21-24) and less closely spaced; buds are glabrous (versus pubescent).

HAB 11,5,12 + E 2. **ABU** g7 s5 =.

0824--*Ulmus alata* Michx.

Ulmaceae: *Ulmus* <*Oreoptelea*> *alata*

This is a widespread southeastern tree, but with a relatively abrupt northern limit. In Ky. there are only a few records of *alata* from the Kentucky Rv. watershed or further north; unverified data of Gm and B are mapped here as open dots. It is restricted to southern counties within Ill. and Ind., and unknown in Ohio or W.Va. [A similar limit occurs in *Smilax bona-nox*.] *U. alata* is distinctive in vegetative characters: its small, narrow leaves have little or asymmetry at base and acute (non-acuminate) tapering at apex; vigorous 1-2 year old twigs develop broad corky wings, unlike any other American elms (but resembling *Liquidambar*).

HAB 10,12,8,7 D 3. **ABU** g9 s9 -1.

0825--*Planera aquatica* J.F. Gmel.

Ulmaceae: *Planera aquatica*

This is restricted to swampy sites on the southeastern Coastal Plain, and more frequent on fertile soils of the lower Mississippi Valley than on the Atlantic side.

HAB 3,2,6 E? 3. **ABU** g8 s8 -2.

0826--*Celtis laevigata* Willd.

Celtidaceae [Moraceae*]: *Celtis laevigata* (*mississippiensis*)

This southeastern tree appears to intergrade somewhat with the two other species of *Celtis* in Ky., and more study of variation is still needed within each species. In both *laevigata* and *occidentalis*, $2n = 20, 30$ and 40 (FNA 3). Some outlying northern or eastern records of *laevigata* deserve further verification, with uncertain status indicated by open dots in the map. But *laevigata* does occur at scattered sites along the lower Ohio Rv. and lower Kentucky Rv. bottomlands, and it is occasionally adventive on nearby uplands. Colls. from BULL, MARS, OHIO (KY) and elsewhere have been identified as the "copiously serrate" (F) var. *smallii* (Beadle) Sarg., which could be transitional to *occidentalis*.

HAB 6,4,7 E 2. **ABU** g9 s9 -3.

0827--*Celtis occidentalis* L.

Celtidaceae [Moraceae*]: *Celtis occidentalis*

This is widespread in central and eastern North America, but generally uncommon to absent in regions with infertile acid soils. In the original woodlands of Ky., *occidentalis* was common in the Bluegrass region, but much less frequent elsewhere (Barton 1919, Campbell 1989); Barton's data shows a strong concentration in FAYE and adjacent counties. It has now increased and spread into many regions after Virginian settlement. Evident variation and hybridization with the other two species of *Celtis* needs further study. Based on F, most trees may be referable to var. *canina* (Raf.) Sarg. Some colls., including many from the Bluegrass region, fit var. *crassifolia* (Lam.) Gray, and a few scattered colls. fit var. *occidentalis*.

HAB 7,6,4,8 E 2. **ABU** g10 s10 +1?

0828--*Celtis tenuifolia* Nutt.

Celtidaceae [Moraceae*]: *Celtis tenuifolia* (?*pumila*)

This is widely scattered in southeastern states, especially on dry calcareous soils. There is much variation that needs further study (including cytology). It has often been confused with the other species of *Celtis*, and hybrids appear to occur. Most colls. fit the relatively pubescent and coriaceous-leaved var. *georgiana* (Small) Fern. & Schub., but further assessment of that taxon is needed. Using older treatments, a few plants were identified as *C. occidentalis* var. *pumila* (Pursh) Gray or *C. pumila* var. *deamii* Sarg., but these taxa may be considered transitional from *tenuifolia* to *occidentalis*.

HAB 12,10,9,8 E? 3. **ABU** g9 s9 -2.

0829--*Maclura pomifera* (Raf.) Schneid.

Moraceae: *Maclura* [Cudrania] *pomifera*

There is no evidence that this tree was present in Ky. before being widely planted in the 19th Century for thorny hedges (Rafinesque 1836, 3:43), especially after 1880 (Shacklette 1937). It is sometimes speculated that native people could have planted this species locally for its useful wood, but at the time of European conquest of North America, *Maclura* was documented only in Ark, Okla., Tex., perhaps La. (FNA 3, W) and perhaps Miss. (Brown 2003; J.L. Seltzer, Cobb Institute of Archaeology, Starkville). Yet there is paleobotanical evidence that *Maclura* occurred as far north as Ontario during a previous interglacial period (Terasmae 1960).

The unusual large fruits of this species are relished by several mammals, especially horses and other larger species; they can cause cattle to choke (observations of JC, LC of ANDE, R. Seymour and others). Also, deer

occasionally appear to have dispersed the seeds. It is likely that extinct equine species or other megafauna formerly dispersed *Maclura* around North America. The tree is dioecious and males tend to have a more upright habit, without branches weighted down by the fruit crops. Plants sometimes spread with lateral root-suckers, and can be easily raised from cuttings and layers.

ALI w. **HAB** f-8,7,4 E 4. **ABU** g8? s8? +3.

0830--*Broussonetia papyrifera* (L.) L'Hér. ex Vent.

Moraceae: *Broussonetia papyrifera*

This dioecious tree is widely planted across eastern states and often escapes, especially in warm regions on moist fertile soils. Although "paper mulberry" has traditional economic uses in East Asia, it is generally considered a weed in North America. Its reddish, somewhat edible fruits are often overlooked, and there are few colls. in herbaria. There appears to be little establishment from seed, but trees persist through vigorous suckers, sometimes spreading from the original stump.

ALI AS. **HAB** f-8,7 E? 4? **ABU** +4.

0831--*Morus rubra* L.

Moraceae: *Morus rubra*

This is widespread across central and eastern North America but it is rarely abundant. Gm noted: "moderately common in Kentucky, but generally occurs singly or a few in a place, never constituting any large proportion of the woody growth." Although it often grows into subcanopies of old field thickets and woodland pastures, browsing appears to limit it, and trees usually die at relatively small size due to diseased bark; see also Burns & Honkala (1990).

In the central Bluegrass, Short (1828-9) noted: "Owing to the deprivations of stock upon this valuable tree, whose bark is a favourite food with horses and sheep, it is becoming rare in this quarter where it once abounded; young trees are never met with in exposed situations, and the old ones have generally a decaying aspect...The wood of the mulberry is more durable when exposed to the vicissitudes of weather than any other timber of this region, except the red-cedar and black-locust; hence, in those parts of the country where those trees are not found, this is much used as posts for fencing."

M. rubra varies greatly in leaves and fruits, but the degree of genetic control remains largely unknown. Rafinesque (1836, 3:46-47) listed five additional species related to *rubra*, but none of his names were used by other authors. Plants of *rubra* in the central Mississippi and lower Ohio Valleys, including

much of Ky., tend to have relatively large fruits (up to 3-4 cm long), and relatively large leaves (blades often 15-30 cm long). Such plants have been recently described as *M. murrayana* D.E. Saar & S.J. Galla (Galla et al. 2009). These authors also indicated distinctive leaf venation and genetic markers, but a range-wide analysis of *rubra* will be needed for any comprehensive recognition of segregates.

HAB 7,5,4 D 2. **ABU** g10 s10 -2.

0832--*Morus alba* L.

Moraceae: *Morus alba*

This northeast Asian tree became cultivated for silkworms in North America over 250 years ago. It has become widely naturalized in warm and mid-temperate region. In the central Bluegrass, Short (1828-9) noted: "The White mulberry, lately introduced by seeds from France, seems to thrive well in this climate, so far at least as four or five year's experience can show." Rafinesque (1836, 3:46) noted: "a well known tree, now widely grown with us, almost wild in some localities." In Ky. it is now locally common in mature riparian woods on base-rich soils (reaching 8 dm or more in dbh), as well as being a common weed in most urban areas.

M. alba is sometimes confused with *rubra*, but it can be distinguished based on leaves alone (FNA 3). In *alba*, lower leaf surfaces have hairs confined to the midvein, major laterals and axils between them (versus widely scattered in *rubra*); upper surfaces are glossy and glabrous or sparsely hairy (versus dull and appressed-hairy or scabrid). Leaf blades are usually smaller (ca. 8-10 x 3-6 cm versus 10-18 x 8-12 cm). Fresh female catkins are shorter (ca. 5-8 mm versus 8-12 mm). Fruits are usually ca. 1.5-2 cm long, dark or pale reddish or whitish, and somewhat insipid (versus 2.5-4 cm, deep purple-black, and more deeply flavored).

In Ontario, and perhaps other northern regions, there has been some hybridization with *rubra* and locally invasive introgression (Burgess & Husband 2006; R. Naczi, pers. comm.). *M. alba* and hybrids with *alba* mothers were consistently more vigorous in experimental shade and sun, compared to *M. rubra* and hybrids with *rubra* mothers. No hybrids have been clearly suggested in Ky., where *alba* usually flowers and fruits a few weeks earlier than *rubra*.

ALI AS. **HAB** f-7,4 D 3. **ABU** +6*.

0833--*Morus nigra* L. C

Moraceae: *Morus nigra*

This Southwest Asian tree has been cultivated for its fruit since antiquity. There are several polyploid races, with $2n$ up to ca. 304-308 (versus usually 28 in *rubra* and *alba*). In Ky. it occurs at scattered sites, usually in old or abandoned gardens, but it does not seem to be truly naturalized. There is a coll. from LEWI (NCU) that may come from a self-seeded tree.

M. nigra differs from *alba* and *rubra* (Whittemore 2006) in its styles, which are relatively long (ca. 3-5 mm versus 1-2 mm) and densely covered with white hairs (versus glabrous or nearly so); fruits are purple-black to black (versus purple, red, pink or white), short-cylindric, 1.4-2.2 cm long (versus cylindric to subspherical, 0.6-1.9 cm); larger leaf blades are reniform-triangular to suborbicular (versus ovate to triangular-ovate), and usually unlobed (versus lobed at least on young shoots). Its leaf pubescence is generally intermediate between *alba* and *rubra*: lower surfaces have hairs along midveins, laterals and often minor veins; upper surfaces are usually deep green (not glossy) and scabrid to glabrous.

ALI EU.

0834--*Fatoua villosa* (Thunb.) Nakai

Moraceae: *Fatoua villosa*

The first North American record of this annual weed was in 1950, and it has now become a local weed in greenhouses and flower beds across much of the eastern U.S.A. (Vincent 2004). It has become locally established in the wild, especially along woodland roads and trails, edges and streams. In Ky. it is locally frequent in urban areas of JEFF and perhaps elsewhere.

ALI AS. **HAB** 10 ::: D 4. **ABU** +4*.

0835--*Cannabis sativa* L.

Cannabaceae [Moraceae]: *Cannabis sativa*

This tall dioecious annual herb has been widely cultivated in eastern states for various uses since the early period of settlement. Short & Peter (1835) noted: "Hemp has long been cultivated in the Elkhorn country around Lexington, and the exuberant fertility of the soil of this district is admirably suited to its culture. Owing to these circumstances it has become partially naturalized, and we have met with it in secluded situations, miles distant from any scene of cultivation." Such waifs have dwindled greatly in recent decades. Records mapped here are mostly older colls. derived from somewhat persistent populations after cultivation of ssp. *sativa* ("hemp").

More recent records derived from illicit cultivation or seed-disposal of ssp. *indica* (Lam.) Cronq. ("marijuana") are generally excluded. During 1980-2000, an active botanist in Ky. was likely to run into cultivated plants of *indica* about once a year, often ingeniously hidden; in one case JC was shown where potted plants had been hoisted with pullies into a tree canopy. Ssp. *indica* can be distinguished primarily by the higher resin content in its epidermal glands; morphological differences are inconsistent (Y). Should the botanist inhale?
ALI AS. HAB H-10 ::: D 6. **ABU** +5<

0836--*Humulus lupulus* L.

Cannabaceae [Moraceae]: *Humulus lupulus* (vars. *lupuloides** + *pubescens**) Variation needs more careful study (FNA 3, Y, W). Most colls. mapped here are probably referable to var. *lupuloides* E. Small (= *H. americanus* Nutt.), which is widespread from northeastern regions to the northern Great Plains (PL). However, that taxon appears intermediate between the European var. *lupulus* (the "hops" used making beer) and the largely midwestern var. *pubescens* E. Small. The coll. from CAMP (KNK) does appear to be var. *pubescens*. Var. *lupulus* has been rarely reported (M), but verified colls. from wild plants are unknown.
HAB 4,6,7? D 4. **ABU** g10 s4 -4.

0837--*Humulus japonicus* Sieb. & Zucc.

Cannabaceae [Moraceae]: *Humulus japonicus*
This vigorous annual vine is an aggressive invader of disturbed fertile soils, especially sandy river banks. The first report was by Gunn (1969b) from JEFF. By the 1980s, *japonicus* had been documented in several counties along the Ohio Rv. upstream of JEFF and along the Big Sandy Rv. (M). During the 1990-2010, it has also become locally abundant along banks of the Kentucky Rv. in the Bluegrass Region (A. Berry, report to KSNPC in 2008). It is much more widespread than colls. indicate.
ALI AS. HAB f-1,4 D 6. **ABU** +5*

0838--*Laportea canadensis* (L.) Weddell

Urticaceae: *Laportea canadensis*
This is widespread in mesic woods across eastern North America, but uncommon to rare on the southeastern Coastal Plain. In the southern half of its range, *Laportea* is generally restricted to riparian terraces, but within cooler regions it occurs more widely through upland woods on fertile soils. In Ky. it may have been much more widespread in farmed landscapes before being reduced by hogs or other livestock, which find it nutritious despite the

stinging hairs. *Ageratina altissima* can largely replace *Laportea* after such disturbance, as found in the forests of the Great Smoky Mts. when influenced by wild boar (Howe et al. 1981; JC, pers. obs.).
HAB 4,5,6,7 D 2. **ABU** g10 s10 -4.

0839--*Boehmeria cylindrica* (L.) Sw.

Urticaceae: *Boehmeria cylindrica*
This is a widespread eastern species on wet fertile soils. Plants treated by F as var. *drummondiana* (Weddell) Weddell have generally not been distinguished in Ky., and may just be a sun-grown form (Cr.).
HAB 6,4,9 D 3. **ABU** g10 s10 -3.

0840--*Pilea pumila* (L.) Gray

Urticaceae: *Pilea pumila*
This is widespread in eastern North America, usually in woods on damp fertile soils; it is less common on the southeastern Coastal Plain.
HAB 7,4,6,5 ::: D 2. **ABU** g10 s10 -2.

0841--*Pilea fontana* (Lunell) Rydb. R

Urticaceae: *Pilea fontana*
This occurs mostly in northeastern regions, and may be expected in northern and eastern Ky. It is similar to *pumila* but has less elongate, tuberculate, dark seeds with pale margins (versus smooth and paler brown with raised lines and mottles); also leaves may be less shiny and translucent (W). It has been reported from Ky. by BA and others, but perhaps based on immature *pumila* (M); there are no clearly identified vouchers.

0842--*Pilea microphylla* (L.) Liebm. W

Urticaceae: *Pilea microphylla*
This is rarely adventive from subtropical America on the southeastern Coastal Plain (W). There are colls. from JEFF (KNK) and MADI (EKY), but these were weeds associated with potting soil. It is probably not truly naturalized in Ky.

0843--*Urtica gracilis* Ait.

Urticaceae: *Urtica gracilis* (*procera*, *dioica** ssp. g.)
This widespread northern species is typically diploid (2n = 26), but has sometimes been combined as a subspecies with the European tetraploid, *U. dioica* L. The latter is a more strongly stinging, often dioecious plant unknown in Ky., but with scattered reports from most adjacent states, especially in the

central Appalachians (FNA 3; W). Combination of these two species has led to some erroneous widespread mapping of an "invasive species" (e.g. SE).

In eastern states, *gracilis* is scattered south along the Ohio Rv. and Mississippi Rv. to La., and along the Appalachians at least to Va. (FNA 3; W). Although somewhat weedy, it is mysteriously absent from most of Ky., and Gm called it "an obscure plant" as well as *Pilea pumila*. It may have become somewhat limited due to its relatively high palatability for some generalist herbivores, including hogs and other livestock; see also notes on *Laportea*.

Either *U. gracilis* or *Laportea* must have been the "nettles" referred to by pioneers in the Bluegrass region as "very tall" or "four feet high" plants collected for fiber to weave with "buffalo wool" (e.g. Fleming 1780 in Mereness 1916; Olive Boone ca. 1842 in Hammon 1999; Clinkenbeard 1842 in Beckner 1928).

HAB 4,6,7 D 4. **ABU** g10 s8 -4.

0844--*Urtica chamaedryoides* Pursh

Urticaceae: *Urtica chamaedryoides*

This southeastern annual can grow throughout the year, with flowering halted only during winter. In Ky. it is locally abundant on river bottoms of the Mississippian Embayment. But it is virtually absent upstream within the Ohio Rv. watershed except in the Bluegrass region of nc. Ky. and se Ohio. (Boufford 1990; PL), where it occurs sporadically on disturbed ground in damp eutrophic woods.

HAB 7,4 :: E 3. **ABU** g8 s8 -4.

0845--*Parietaria pensylvanica* Muhl. ex Willd.

Urticaceae: *Parietaria pensylvanica*

This is widespread on base-rich soils across temperate North America, but less common on the southeastern Coastal Plain. In addition to rocky woods, especially below limestone cliffs, typical habitats include dusty ground below eaves and similar bare soils. A few depauperate plants (M) have been misidentified as *P. praetermissa* Hinton or the often confused *P. floridana* Nutt., which occurs further south on the Coastal Plain.

HAB 11,7,12 +:: D 3. **ABU** g10 s10 -1?

0846--*Fagus grandifolia* Ehrh.

Fagaceae: *Fagus grandifolia*

Most or all material from Ky. matches the common variant of southeastern states known as var. *caroliniana* (Loud.) Fern. & Rehd. But that taxon integrades with the more northern and montane var. *grandifolia*, and it is not recognized in some recent treatments. See FNA 3 and W for contrasting discussion.

HAB 5,7 C 1. **ABU** g9 s9 -4.

0847--*Castanea dentata* (Marsh.) Borkh.

Fagaceae: *Castanea dentata*

The American Chestnut occurs east of the Mississippi Rv., centered in Appalachian regions, but it has been greatly reduced due to the disastrous blight of ca. 1900-1950. It used to be widespread in Ky. and locally abundant on acid sandy soils, especially in the Cumberland Mts. and adjacent rugged hills (Barton 1919). Unverified records mapped here as open dots include historical data of Barton (1919), Gm and B; Gm listed counties throughout western regions, but Barton and B did not. It was never recorded from the Bluegrass region, and it was uncommon to absent in most counties west of the Green Rv. After the 1930s, *C. dentata* has largely disappeared, but small sprouts are still scattered at low density and occasionally grow to sapling size. Seed production is very rare, but there have been reports of this since 1980 from BARR, BUTL, HARL, LARU and POWE (from KSNPC, American Chestnut Foundation and others).

HAB 11,5,7 B 2. **ABU** g4? s2? -5.

0848--*Castanea pumila* (L.) P. Mill.

Fagaceae: *Castanea pumila*

Before fungal blight and fire-suppression, this southeastern shrub or small tree may have been much more frequent, at least in Appalachian regions. Solid dots indicate verified native plants. Unverified historical records are mapped here as open dots, but those of Gm and others are hard to interpret. Some colls. may have come from planted or escaped individuals; these include some mapped by Johnson (1988) and CW. Although old colls. from JEFF and OLDH from roadsides or parks have been considered native in previous databases, their status is dubious. There appear to be no verified records of native plants from Ind. (D) or Ohio, despite recent mapping in those states by FNA 3 and others. There may be rare hybrids with *dentata*, as indicated by a coll. from adjacent Tenn. (Johnson 1988).

HAB 8,7,11,10 B? 4. **ABU** g10 s2 -5.

0849--*Castanea mollissima* Blume

Fagaceae: *Castanea mollissima*

This has been widely planted for its nuts. Most records mapped here may be from planted trees, but occasional self-seeding does occur. Open dots indicate uncertain status. *C. mollissima* is often confused with *dentata*, but can be distinguished by the persistently dense hairs on lower leaf surfaces and twigs (versus glabrate). Its leaves tend to be smaller (mostly 10-15 cm long versus 15-25 cm) and less acuminate; also, trees usually have multiple stems (versus one dominant). Breeding of blight-resistant trees has involved hybridization between these two species, and further confusion can be expected as these hybrids become released.

The European species, *C. sativa* Mill., may also be expected in Ky. but remains unconfirmed (Clark et al. 2005; CW). Leaves of *mollissima-dentata* hybrids may be hard to distinguish from *sativa*, which combines stellate pubescence (as in *mollissima*) with minute stalked glands, when young (J; Zander 2000). In *dentata*, glands are not stalked but embedded between veins, and twigs are completely glabrous.

ALI AS. HAB f-8,7,10? B 3. ABU +4.

0850--*Quercus alba* L.

Fagaceae: *Quercus alba*

This is a widespread eastern species, most common in medium acid soils on submesic to subxeric sites. In the central Bluegrass, Short (1828-9) noted: "The white oak is not often met with in the rich tract of land immediately surrounding Lexington; but is found abundantly in that part of Fayette county bordering the Kentucky river; where the soil becomes thinner and the face of the country more rolling." In Ky. there are occasional hybrids with most other species in the white oak group. Those with *montana* and *stellata* may be most frequent (M).

HAB 11,7,5 C 2. ABU g10 s10 -2.

0851--*Quercus macrocarpa* Michx.

Fagaceae: *Quercus macrocarpa* (var. m.)

This is widespread across central North America, with some eastern extensions. In Ky. and Tenn. it is strongly concentrated in the Bluegrass region, the Nashville Basin, and some rich bottomlands along larger rivers to the west. In the central Bluegrass, Short (1828-9) noted: "This noble species is every where met with in the rich forests of this neighbourhood, towering above the most of other trees and throwing out its large umbrageous branches

to a considerable distance around." There appear to be occasional hybrids with *alba*, *bicolor*, *muhlenbergii* and perhaps other species.

Most of the unverified historical data of Gm and B are mapped here as open dots. Reports of Gm and Little (1971) from the Appalachian Plateaus of Ky. remain dubious. But *macrocarpa* does occur rarely in Appalachian valleys of se. Ohio, and perhaps sw. W.Va. according to some sources (K and PL, but not Little or HFG).

HAB 10,8,7,6 E 3. ABU g9 s8 -4.

0852--*Quercus lyrata* Walt.

Fagaceae: *Quercus lyrata*

This southeastern species occurs mostly on the Coastal Plain, but it is also scattered in swampy woods elsewhere. In Ky. there appear to be occasional hybrids with *bicolor*, *macrocarpa*, *michauxii* and perhaps others. Some of the disjunct colls. from central and eastern counties may be hybridized or otherwise atypical, but most colls. from closer to the Ohio Rv. are clearly typical *lyrata* (HARD, JEFF, OLDH).

HAB 9,6,3 D 3. ABU g8 s8 -2.

0853--*Quercus stellata* Wangenh.

Fagaceae: *Quercus stellata*

Although this widespread southeastern species ranges across most of Ky., it is much less frequent in eastern regions. Barton's (1919) data indicates two strong historical western concentrations: in HARD, HART and adjacent counties; also in CRIT, LYON and adjacent counties. *Q. stellata* was probably promoted by frequent fires before settlement, and it has declined greatly with fire suppression after 1900. There are occasional hybrids with *alba* and probably other species. A few colls. from JEFF (DHL) suggest introgression from *lyrata*. *Q. stellata* has the smallest acorns of white oaks in Ky. (nuts ca. 10-20 x 8-12 mm), which is probably associated with dispersal by birds in more open land; see also notes under *Q. phellos*.

HAB 10,12,7,11 C 4. ABU g9 s9 -2.

0854--*Quercus bicolor* Willd.

Fagaceae: *Quercus bicolor*

This is widely scattered across northeastern states, but concentrated in more extensive swampy woods. Leaves of this variable species are sometimes confused with *michauxii*, *muhlenbergii* or *montana*, especially shade-leaves; see keys in FNA 3, Stein et al. (2003) and W. In Ky. there appear to be

occasional hybrids with *alba*, *lyrata*, *macrocarpa*, *michauxii*, *muhlenbergii* and probably others. Introgression with some of these species, especially *macrocarpa*, may explain the variability of leaf shapes in *bicolor*.

HAB 9,6 D 3. **ABU** g8 s8 -3.

0855--*Quercus michauxii* Nutt.

Fagaceae: *Quercus michauxii* ("prinus")

This is widely scattered across southeastern states, but concentrated in extensive tracts of swampy woods, especially gradual transitions to adjacent drier ground. The epithet *prinus* has been applied to this species by many authors; see notes under *montana*. Leaves of *michauxii* are sometimes confused with *muhlenbergii*, especially in the shade, where *muhlenbergii* is often much less densely stellate-hairy than in sun; introgression has been suggested (CW). *Q. montana* is somewhat intermediate in its pubescence.

Compared to *muhlenbergii*, leaf blades of *michauxii* (like *montana*) tend to have more rounded teeth (versus acute to hardened projections), larger average size (ca. 10-28 x 5-18 cm versus 5-15 versus 4-8 cm), more consistently obovate shape (versus often lanceolate to oblong), and more gradual narrowing at the base (versus broadly cuneate to rounded). Lower surfaces have largely erect felty hairs that have mostly 1-4 rays (versus appressed stellate hairs that have 6-10 rays), and tend to be less whitish-glaucous. Upper surfaces tend to be less glossy, with more impressed tertiary nerves that are clearly visible with transmitted light. See FNA 3, Stein et al. (2003) and W for more details.

HAB 6,9 D 2. **ABU** g9 s8 -4.

0856--*Quercus montana* Willd.

Fagaceae: *Quercus montana* ("prinus")

Like *Castanea dentata*, this tree is native only east of the Mississippi, and centered in Appalachian regions. In Ky. it is largely restricted to hills on infertile shales and sandstones, but there are a few unusual sites within more base-rich landscapes. These include a few highly leached narrow ridges or ancient high terraces in the Bluegrass region, and the edge of a swamp on slumped sandy material in TAYL.

Reports of *montana* from the northwestern edges of the Bluegrass and from loess hills along the Mississippi need further verification (Gm, Little 1971, Stein et al. 2003, but *montana* is known from most of the southern tier of counties in Ill., Ind. and Ohio (PL), including Hamilton Co., Ohio (Hodgson

1998). B reported a coll. from OWEN (check US), and a coll. from the Kleber Sanctuary in OWEN (DHL) appears to be *muhlenbergii* introgressed with *montana*. Local introgression with *michauxii* is also suspected, and clear hybrids with *alba* are widely scattered.

Q. prinus L. has often been considered the correct name for this species, but *prinus* has also been applied to *michauxii*, causing much confusion. Hopefully the proposal of Whittemore & Nixon (2005) to reject *prinus* will succeed (Brummitt 2007).

HAB 11,12,7 A 2. **ABU** g9 s9 -1.

0857--*Quercus muehlenbergii* Engelm.

Fagaceae: *Quercus muehlenbergii* (*prinoides* var. *acuminata*)

This is widespread in central and eastern North America, but largely restricted to base-rich soils. In Ky. it is most common in calcareous regions, but also occurs at low density on more base-rich shales within the rugged Appalachian hills. There appears to be rare hybridization with *macrocarpa*, *alba*, *bicolor*, *montana* and *michauxii*; see notes under those species.

Acorns of *muhlenbergii* are relatively small (with nuts ca. 10-20 x 10-15 mm) compared to most other white oaks in Ky. (see also *stellata*), and unusually variable in size. Nuts of only 5-10 x 5-10 mm are sometimes produced, especially in dry years. Acorns drop relatively early (late Sep to early Oct), or are rapidly consumed by birds in the trees.

HAB 11,7,12,5 E 2. **ABU** g10 s9 -3.

0858--*Quercus prinoides* Willd. R

Fagaceae: *Quercus prinoides* (var. *p.*)

This is known from disjunct regions of the east-central states, in remnants of scrubby (often pyric) vegetation on a range of soils (not typically calcareous as for *muehlenbergii*). There have been reports from Ky. in FNA 3 and several other sources, but no colls. have been located (M). The closest known plants are in the Ridge-and-Valley region of w. Va. (HW+). It might have been expected on open rocky summits of the Cumberland Mts. before fire suppression, and it was reported from BELL by Defries (1884a,b).

Q. prinoides has often been confused with stunted forms of *muehlenbergii*. It is a low shrubby species, typically reaching only 1-3 m tall, and sometimes spreading by rhizomes. Its leaf blades have only (3) 5-7 (9) veins on each side,

compared to (8) 10-13 (16) in *muehlenbergii*, and their bases are usually cuneate (versus usually truncate).

0859--*Quercus rubra* L.

Fagaceae: *Quercus* <*Erythrobalanus*> *rubra* (var. *r.*; *borealis* var. *maxima*) This is widespread across most of eastern North America, but rare to absent on the southeastern Coastal Plain. In Ky. there are occasional hybrids with several other species (at least *shumardii* and *imbricaria*). There are no wild records of the northern var. *ambigua* (Gray) Fern. (= var. *borealis* (Michx. f.) Farw.), which has deeper cups around acorns (about a third covered versus a quarter), deeper leaf sinuses (up to 1/3 versus 1/4), and paler smoother bark (F, W). However, many planted trees with northern origins appear to be var. *ambigua*, and probably contributing significantly to local gene-pools. These trees can easily be confused with some forms of *shumardii* or with putative *rubra-shumardii* intergrades.

HAB 5,11 C 1. **ABU** g10 s10 -2.

0860--*Quercus shumardii* Buckl.

Fagaceae: *Quercus* <*Erythrobalanus*> *shumardii* ("texana") Most records mapped here are var. *shumardii*, but see also notes under var. *schneckii*. This species is widespread across southeastern states, but generally restricted to base-rich soils. In early literature from Ky., it was confused with *palustris* (Short 1828-9; Short et al. 1833-40) or with *texana* (Pr, Gm); B provided the first usage of the name *shumardii*. Hybrids with *palustris* are not documented in Ky., but there do appear to be occasional hybrids with *rubra*, *velutina* and perhaps others; introgression may be extensive in some populations.

Q. shumardii is often difficult to identify based on leaves alone, which are similar in shape to *coccinea* but relatively deep green above, often turning maroon in fall (versus bright green, turning scarlet); see also note on buds under *coccinea*. In both species, but especially *shumardii*, well-developed sun-leaves have lobes that broaden distally, often pinching off the sinuses.

HAB 7,6,11 E 3. **ABU** g9 s9 -3.

0861--*Quercus shumardii* Buckl. var. *schneckii* (Britt.) Sarg.

Fagaceae: *Quercus* <*Erythrobalanus*> *shumardii* var. *schneckii* This taxon is poorly understood; mapping here is provisional and incomplete. It was initially reported to have a more interior western range (Sargent 1905, 1926). Most Ky. records come from hills around the Bluegrass region and

adjacent to the Pennyrhile Karst Plain. Differences in habitat remain unclear; var. *schneckii* may be concentrated on seasonally dry uplands, while var. *shumardii* is most common on damper soils (see also W), but B reported an opposite trend.

Distinction of var. *schneckii* has been based primarily on its somewhat smaller acorns, with ca. 1/3 covered by the cups; typical *shumardii* is usually more like typical *rubra* in its acorns, with only ca. 1/4 covered by the cups. Var. *schneckii* may also have generally smaller leaves on mature branches (the blades mostly 7-9 cm long versus 9-13 cm), with fewer lobes, and smaller buds.

HAB 11,12? E 3. **ABU** g8? s8? -3?

0862--*Quercus texana* Buckl.

Fagaceae: *Quercus* <*Erythrobalanus*> *texana* (*nuttallii*, *shumardii* var. *t.*, *palustris* forma *n.*)

This occurs in the lower Mississippi Valley, especially on slackwater flats with subhydric clayey alluvium that dries out during summer to fall. It is rare at the northern edge of its range in se. Mo., w. Ky and s. Ill. (FNA 3). Colls. from CALL (EKY; Clark et al. 2005), HICK (KY) and MARS (MUR) are vegetative but identification is fairly certain. There is also a coll. with acorn from BALL (EKY) that is probably *texana* or perhaps a transition to *shumardii*.

In overall form and size of acorns, leaves and buds, *texana* seems intermediate between *palustris* and *shumardii* (FNA 3). But it is distinct from both in its acorn cups, which are uniformly pubescent on the inner surface (versus glabrous except around the scar), and deeper (covering 1/3-1/2 versus 1/4-1/3), with the acorn often more elongated (versus often globose in *palustris*, but variable in *shumardii*). Leaves are similar in shape to *palustris*, generally 5-lobed but highly variable; lateral lobes tend to be more angled towards apex (versus almost perpendicular to midrib), and the terminal lobe tends to have parallel sides or tapers without prominent sublobes. Leaf blades tend to be deeper glossy green above, drying to dark greyish or blackish (versus bright pale green to pale brown in *palustris*, or deep green to maroon or brown in *shumardii*).

HAB 9,3? D? 3. **ABU** g8 s2? -3?

0863--*Quercus palustris* Muenchh.

Fagaceae: *Quercus* <*Erythrobalanus*> *palustris*

This widely planted species is becoming locally naturalized outside its original distribution on swampy sites in east-central states. Clearly adventive records are excluded here, though a few remain uncertain. In Ky. there appear to be occasional hybrids with shumardii, phellos and others.

Based on leaves alone, palustris is sometimes confused with other deeply lobed species, especially shumardii and coccinea. Its leaves are usually plain shiny green to (especially on richer soils) yellowish and paler below, turning pale brown in fall; in contrast, the leaves of similar species are mostly deeper green (except coccinea), and tend to become darker brown or reddish during fall. Leaves are typically smaller (as are buds), ovate in overall outline (versus often obovate), with 5-7 main lobes (versus 5-11); see FNA 3 for details. Lobes are usually more acute, with one of the 2-3 divisions distinctly elongated (versus usually truncate, without a more prominent division); and more or less parallel-sided or tapering outwards (versus often broadening), with sinuses widening outwards (versus often pinched off in well-developed sun-leaves of shumardii and coccinea).

HAB 9,6 C 3. **ABU** g9 s9 -3.

0864--Quercus coccinea Muenchh.

Fagaceae: Quercus <Erythrobalanus> coccinea

This occurs mostly east of the Mississippi Rv., centered in Appalachian regions but extending into some other regions with dry acid soils. In Ky. it has sometimes been confused with shumardii, leading to spurious reports from calcareous regions. However, records from BRAC (EKY), CAMP (JC for KY) and OLDH (DHL) are confirmed, coming from very small populations on old high terraces or acid shales peripheral to the Bluegrass region.

Introgressive hybridization with rubra and perhaps shumardii has been suggested in Ky. (CW), and hybrids with several other species are possible (FNA 3). But there is little definitive evidence of hybridization in Ky., and it is remarkable that there are not even reports of hybrids with velutina, which appears to be the closest relative of coccinea in Ky. (F, M). Compared to other red oaks typical of mature unbroken forest, both coccinea and velutina have relatively deep acorn cups, pubescent to tomentose buds, and generally blackish blocky bark (J).

HAB 11,7,10 A 3. **ABU** g9 s9 -1.

0865--Quercus velutina Lam.

Fagaceae: Quercus <Erythrobalanus> velutina

Although widespread in eastern states, this species is uncommon to absent on fertile base-rich soils. In Ky. there appear to be occasional hybrids (or perhaps introgressants) with several other species, including imbricaria, marilandica, rubra and shumardii, but there is no reported intergradation with coccinea.

HAB 11,7,10 C 3. **ABU** g10 s10 -2.

0866--Quercus pagoda Raf.

Fagaceae: Quercus <Erythrobalanus> pagoda (falcata var. pagodifolia)

This occurs mostly on the southeastern Coastal Plain, but it also occurs upstream along some lowlands. In Ky. it extends into the Shawnee Hills, where it is locally abundant on alluvial terraces or deeper residuum with much loess (generally subhydric or submesic).

Q. pagoda has often been overlooked and confused with falcata or other species (FNA 3). There may be occasional introgression with falcata, but pagoda is generally distinct in its leaves. These have 5-9 (11) more or less equal moderately deep lobes (versus 3-7 shallow or deep lobes, the terminal one much longer in sun leaves); bases are cuneate to concave-rounded or truncate leaf base (versus usually convex-rounded); surfaces have a bluish green hue (versus dull or brownish green), with pale grayish hairs below (versus pale rusty brownish). Terminal buds are somewhat 5-angled (versus almost terete). Bark is usually blackish, with flaky ridges (versus brown to blackish, with more persistent ridges and furrows).

HAB 6,9,7 C 3. **ABU** g9 s8 -4.

0867--Quercus falcata Michx.

Fagaceae: Quercus <Erythrobalanus> falcata (var. f., triloba)

This is a widespread southeastern species, but generally rare to absent in deeper woods with little history of fire or other disturbance. In Ky. there are occasional hybrids with other species, including the closely related pagoda, which has been confused.

HAB 10,7,11,12 C 4. **ABU** g9 s9 -3.

0868--Quercus ilicifolia Wangenh. R

Fagaceae: Quercus <Erythrobalanus> ilicifolia

This is a shrubby northeastern species, centered in the northern Appalachians and coastal regions from N.J. to Me. (FNA 3, K). It occurs on sterile sandy soils, sometimes together with prinoides. It extends southward into the Blue Ridge of N.C., but not westward beyond the higher mts. of Va. There are some old unverified reports of ilicifolia from Ky. (e.g. Short 1837, Defries

1884a,b; others reviewed by M). Hypothetically, it might have occurred in the Cumberland Mountains before fire-suppression.

The vegetative coll. from FLOY (KY) noted by Clark et al. (1997) appears to be a stunted form of *velutina*, based on examining a range of material and revisiting the locality. The leaves of this coll. have similar size and shape to *ilicifolia*, but their lobes are less pointed; they lack persistent white-felty tomentum on lower surfaces (nor on twigs); and they lack deep bluish-green color.

0869--*Quercus marilandica* Muenchh.

Fagaceae: *Quercus* <*Erythrobalanus*> *marilandica*

This is a widespread southeastern species, but largely restricted to thin woods on seasonally dry infertile soils, especially areas with a history of frequent fire or other disturbance. There are occasional hybrids in Ky. with *velutina* and probably other species.

As observed by Michaux (1803), *marilandica* was originally abundant around margins of fire-maintained "barrens" in parts of w. Ky. Like *stellata*, *marilandica* has declined greatly in many areas of the state, especially on deeper soils, due to succession from pyric to submesic forest and conversion to farmland. It is less long-lived than *stellata* and its disappearance has been even more dramatic. Early reports from the Bluegrass region remain unverified, but the reports of Gm from the Blue Licks area (NICH, ROBE) are believable, considering the unusual influences from ungulate and humans at that locality before Virginian settlement (Campbell 1989; and associated historical citations).

HAB 10,12 B 4. **ABU** g9 s9 -3.

0870--*Quercus nigra* L.

Fagaceae: *Quercus* <*Erythrobalanus*> *nigra*

This occurs mostly on the southeastern Coastal Plain, but it also occurs locally on damp uplands of the southern Interior Low Plateaus. In Ky. there is some uncertainty about the native range, given possible plantings and old obscure records (CW). *Q. nigra* does appear to be native in southern regions of the state, but very rare. There is a large tree near the cabins at Kentucky Dam Village State Park in MARS, as well as younger ones in the vicinity (M). There is also a large native-looking tree at the edge of Meadow Creek Swamp in WAYN (Clark et al. 2005).

HAB 9,6,7 C 4. **ABU** g9 s4 -5?

0871--*Quercus imbricaria* Michx.

Fagaceae: *Quercus* <*Erythrobalanus*> *imbricaria*

This species of east-central states is most common in open woods and thickets on somewhat base-rich soils. In Ky. it occurs mostly in localities that probably had thin woodland maintained by browsing or burning before modern agriculture. There are occasional hybrids with other species, including *falcata*, *rubra*, *shumardii* and *velutina*.

In the central Bluegrass, Short (1828-9) noted: "The laurel oak, though a very common tree in some portions of Kentucky, especially in that section called "the barrens," is comparatively rare in this locality; nevertheless it does occur occasionally in company with the last [*Q. muhlenbergii*] on the richest lands..." Gm (1914) noted that it was "extremely common" in LOGA (a county of the barrens), where *Juniperus virginiana* was also unusually abundant. *Q. imbricaria* is still a frequent component of young woods in or near former "barrens" of the Pennyrhile Karst Plain.

HAB 10,12,7 D 4. **ABU** g9 s9 -1.

0872--*Quercus phellos* L.

Fagaceae: *Quercus* <*Erythrobalanus*> *phellos*

This southeastern species has sometimes been confused with *imbricaria*. Old reports from n. Ky. remain dubious (Gm), and further verification of *phellos* is needed in several counties. It is often restricted to small peripheral remnants of swampy woodland that experience seasonal drought or disturbance. There are occasional hybrids with *pagoda*, *velutina*, *palustris* and probably other species.

Q. phellos has the smallest acorns among oaks of Ky. (nuts 8-12 x 6.5-10 mm). In general the red oaks of more open, stressed, xeric or hydric sites have smaller acorns: with nuts mostly 9-16 x 8-16 mm (versus 12-30 x 10-21 mm in *rubra*, *shumardii*, *texana*, *coccinea* and *velutina*).

HAB 9,6 C 4. **ABU** g9 s8 -3.

0873--*Corylus americana* Walt.

Betulaceae <*Coryloideae*>: *Corylus americana*

This hazelnut is widespread in eastern North America, except on the Gulf Coastal Plain. Included here as open dots are the unverified historical data from Gm, B and other sources. Although still scattered across most of Ky.

except on the richest calcareous soils, the species is rarely abundant and good nut crops are uncommon due to shade and squirrels.

As in some midwestern regions (e.g. Y), *Corylus* used to be locally dominant in more open woodland and brushy grassland early after settlement (Flint 1822, Short 1828-9, Allen 1899). In the "barrens" around Green Rv. or Salt Rv., during a period with declining fire frequency, Flint noted: "Small hazel bushes from two to three feet in height abound in these; and the quantity of nuts produced exceeds any thing of the kind which I have ever seen." In the central Bluegrass, Short noted: "...although originally a native of this country, is no longer found growing wild in this immediate neighbourhood, yet it is frequently met with in gardens and shrubberies. In the western part of the state it abounds, often forming on the richest barrens almost impenetrable brakes. In these situations the bush attains the greatest perfection; its stems often measuring near the root more than an inch in diameter, rising 10 or 12 feet high, and bearing a profusion of large well-flavored nuts." The only extensive viable remnants of such vegetation anywhere in North America are now reported from n. Ind. and n. Ill. (NS; CEG 005072).

HAB 8,7,9,6? C 4. **ABU** g10 s9 -3.

0874--*Ostrya virginiana* (P. Mill.) K. Koch

Betulaceae <Coryloideae>: *Ostrya virginiana*

This is a widespread eastern species. Var. *lasia* Fern., with densely villous branchlets, has been distinguished in southern regions (F), including Ky. (M), but it has not been recognized in recent treatments (FNA 3, W). Compared to *Carpinus*, leaves of *Ostrya* differ in their downy lower surfaces (versus glabrous); and they are usually more coarsely serrate, with less distinction between large and small teeth (versus clearly double-serrate).

HAB 11,5,7 D 1. **ABU** g10 s10 -2.

0875--*Carpinus caroliniana* Walt. var. *caroliniana*

Betulaceae <Coryloideae>: *Carpinus caroliniana* var. *c.*

Further work is needed to map this southern segregate, which does intergrade with the more widespread var. *virginiana* (Furrow 1987a,b; FNA 3, Y). Var. *caroliniana* differs in its generally smaller leaves (ca. 4-8 x 2-4 cm long versus 6-12 x 3-5 cm), with acute apex (versus more abruptly narrowed or acuminate), secondary teeth relatively small and blunt, and lower surfaces lacking dark conspicuous glands; also bracts have less sharp tipped apices and teeth.

HAB 4,6 D 2. **ABU** g10 s10 -3.

0876--*Carpinus caroliniana* Walt. var. *virginiana* (Marsh.) Fern.

Betulaceae <Coryloideae>: *Carpinus caroliniana* var. *virginiana*

This is a widespread eastern species. Most material in Ky. has not been checked carefully, but this variety is clearly the predominant over typical *caroliniana*.

HAB 7,5,4,6 D 2. **ABU** g8? s5? -3.

0877--*Betula nigra* L.

Betulaceae <Betuloideae>: *Betula* <Costatae> *nigra*

Although widespread across much of the southeast, this species is uncommon to absent in calcareous regions. Reports from the Bluegrass region need verification: CARR (Gm), FRAN (Little 1971), GALL (Gm), KENT (CW) and SPEC (Gm). Barton's (1919) data indicate that it was a significant component of original forests only in the Mississippian Embayment.

HAB 4,6,1 C 3. **ABU** g9 s9 -1.

0878--*Betula lenta* L.

Betulaceae <Betuloideae>: *Betula* <Costatae> *lenta*

Throughout its range this species is largely restricted to Appalachian regions or nearby hills. For Ky. earlier reports from western counties are highly dubious but slightly intriguing (Gm, Little 1971, Faller 1975, FNA 3). Barton's (1919) data indicate that this species (or perhaps locally *allegheniensis*) was a significant component of the original forests only in or near the Cumberland Mts.

HAB 5,7 A 3. **ABU** g9 s9 =.

0879--*Betula alleghaniensis* Britt. var. *alleghaniensis*

Betulaceae <Betuloideae>: *Betula* <Costatae> *allegheniensis* var. *a.* (*lutea*)

This northeastern tree has several disjunct populations along southwestern portions of its range; see notes under var. *macrolepis*. The species is a polyploid (2n = 84), in marked contrast to *nigra* and *lenta* (2n = 28; FNA 3).

HAB 5,7 A 3. **ABU** g9 s8 =.

0880--*Betula alleghaniensis* Britt. var. *macrolepis* (Fern.) Brayshaw

Betulaceae <Betuloideae>: *Betula* <Costatae> *allegheniensis* var. *macrolepis*

Although this relatively western variety is not recognized in some recent treatments (e.g. FNA 3), further study is desirable. There does seem to be some distinction in the disjunct plants of the Shawnee Hills in w. Ky. and in Crawford Co. of s. Ind. (D, F).

HAB 5 A 3. **ABU** g9 s5? =.

0881--Betula pendula Roth C

Betulaceae <Betuloideae>: *Betula pendula* (verrucosa)

This European white birch is widely planted and reportedly escaped at scattered sites across northern regions of North America. In Ky. there have been colls. from JEFF (NCU), LAUR (BEREA), OLDH (DHL) and PIKE (CW), but these generally appear to be from persistent plantings, rather than truly naturalized plants. There are also a few old reports of the native white birch, *B. populifera* Marsh., and the dwarf birch, *B. pumila* L., but these are highly dubious and unverifiable (M).

ALI EU.

0882--Alnus serrulata (Ait.) Willd.

Betulaceae <Betuloideae>: *Alnus serrulata*

This shrub is widely scattered over southeastern and Atlantic states, but largely restricted to wet acid soils. In Ky. it is generally absent from the Bluegrass, but there are a few records from sandy terraces of the Kentucky Rv. in JESS, FRAN and OWEN.

HAB 2,6,1,9 B 4. **ABU** g9 s9 -3.

0883--Alnus glutinosa (L.) Gaertn. C

Betulaceae <Betuloideae>: *Alnus glutinosa*

This tree is widely planted in northeastern regions, sometimes spreading by seed, and "occasionally becoming a weedy pest" (FNA 3, PL). In Ky. there have been unverified reports of escapes from plantings, especially on strip mines (CW; T. Kimmerer, pers. comm.). In a few cases, labels on colls. indicate naturalization (e.g. R. Thompson #2093 from BELL), but definitive evidence of seedlings is not yet available.

ALI EU.

0884--Juglans cinerea L.

Juglandaceae: *Juglans cinerea*

This widespread northeastern tree is now much declined due to disease of the bark. In Ky. documentation with colls. is rather poor; included here as open dots are the unverified historical data of Gm and B. The species has virtually disappeared from some regions of the state, and it remains locally frequent only on fertile sandy terraces of some Appalachian valleys.

Trees of *cinerea* are easily distinguished from *nigra* by their distinctive gray-white bark. Also, the ellipsoidal fruits ("butter-nuts") are clammy with glandular hairs. Twigs can be distinguished from *nigra* by their longer terminal buds, ca. 12-18 mm (versus 8-10 mm), and the upper sides of bud scars straight (versus notched), with a distinct velvety fringe; pith is dark brown (versus light brown). Leaves usually have 11-17 leaflets (versus 15-19), hirsute beneath with 4-8-rayed fascicled hairs (versus single and 2-rayed hairs).

HAB 7,5,4 D 3. **ABU** g7 s6? -5.

0885--Juglans nigra L.

Juglandaceae: *Juglans nigra*

This is widespread across eastern North America, but concentrated on fertile base-rich soils. In Ky. it is much more abundant in the Bluegrass region than elsewhere; this pattern also existed in the original woodland (Barton 1919, Campbell 1989). It was probably also concentrated locally in or near lowlands of the Pennyrhile Karst Plain, where remnants of *Juglans-Aesculus* woodland can still be found, similar to those in the Bluegrass.

HAB 7,8,4 E 3. **ABU** g10 s10 -2.

0886--Carya cordiformis (Wangenh.) K. Koch

Juglandaceae: *Carya* <Eucarya> *cordiformis*

This "bitternut" is a widespread eastern tree, concentrated on more mesic, fertile soils than most other hickories. In Ky. there are rare apparent hybrids with *ovata*, *glabra* and perhaps other species.

In early documents from Ky., names for this tree included "white hickory" (e.g. by early land surveys of the central Bluegrass) or "pignut hickory" (e.g. by Short 1828-29). In the central Bluegrass, Short noted: "*Carya porcina* (Pig-Nut Hickory, brown hickory). It is in every respect the least valuable of the family, the wood being not fitted for useful application to the arts, less valuable as fuel; and the nut unfit to eat in consequence of its bitterness and astringency. Young trees of this kind are, however, more common around Lexington than any other Hickory."

HAB 5,7 D 1. **ABU** g10 s10 -3.

0887--Carya aquatica (Michx. f.) Nutt.

Juglandaceae: *Carya* <Eucarya> *aquatica*

This southeastern tree occurs mostly in swamps of the Coastal Plain, but it also extends into some larger valleys of the southern Interior Low Plateaus

(PL). In Ky. it is recorded mostly near the lower Ohio and lower Green Rivers, and remains unknown on the Mississippi lowlands (CARL, HICK & FULT). Along cypress/tupelo sloughs, this species appears to associate with backwaters that have less frequent, or less intense, flooding and alluviation. Hybrids with *illinoensis* can be expected (FNA 3).

Without flowers or nuts, distinction of *aquatica* from *illinoensis* is sometimes difficult. Its leaflets tend to be fewer (usually 7-13 versus 9-19), on shorter petiolules (0-2 mm versus 0-7 mm in laterals), less clearly serrate (versus often double-serrate), with less branched secondary veins (about 1 per tooth versus 1 per 2-3 teeth), and more villous below along veins (Sargent 1926; Cr, FNA 3, St, W).

HAB 3,9 D? 3? **ABU** g8 s5 -3.

0888--*Carya illinoensis* (Wangenh.) K. Koch

Juglandaceae: *Carya* <Eucarya> *illinoensis* (pecan)

The native range of this commonly planted species (pecan) was originally centered in the lower Mississippi Valley, but even before Virginian settlement it is likely that people extended its distribution. In Ky. native trees appear to have been locally frequent near the Ohio Rv. upstream to at least JEFF, and a few colls. suggest native status as far as TRIM (DHL) and KENT (B). *C. illinoensis* also extended up the Cumberland Rv. to the Nashville Basin (Ch), but its status further upstream in Ky. remains uncertain. Included here as open dots are the unverified historical data of Gm. Excluded are colls. that probably came from planted or escaped trees; see also CW. Various cultivars or selections are often planted or grafted. There are also rare natural or artificial hybrids with *laciniosa*, *ovata* and other species. Note that the old spelling "*illinoensis*" (F) was incorrect (Cr, FNA 3).

HAB 6,4 E? 3? **ABU** g9 s8 -4.

0889--*Carya laciniosa* (Michx. f.) G. Don

Juglandaceae: *Carya* <Apocarya> *laciniosa*

In Ky. this tree of east-central states occurs on deep fertile soils, especially in the Bluegrass region and on western lowlands, but it also occurs locally along some river valleys within Appalachian regions. Included here as open dots are the unverified historical data of Gm and B. The closely related *ovata* has a more widespread range across eastern North America, mostly on uplands or drier terraces, but there is much overlap in habitat and probably some introgression.

C. laciniosa differs from *ovata* (F; FNA 3; W) in its nuts laterally flattened and obovoid (versus globose and sharp-pointed at apex), with the shell typically thicker (ca. 3-6 mm versus 2 mm) and reddish-brown (versus whitish-brown). Leaflets are usually (5-) 7 (-9), versus (3-) 5 (-7) in *ovata*, deeper glossier green, and lack the persistent subterminal tufts of hairs on serrations (as found in *ovata* and *carolinae-septentrionalis*). The petiole and rachis is often persistent in winter on young vigorous trees (but never so in *ovata*; Meijer 1972a). Bud scales are glabrous (versus partly hairy); and young twigs are orange- or pale tan (versus reddish- or olive-brown). The bark is hard to distinguish, but peeling plates may be typically narrower and shorter.

HAB 7,6,9 E 2. **ABU** g9 s9 -3.

0890--*Carya ovata* (P. Mill.) K. Koch

Juglandaceae: *Carya* <Apocarya> *ovata* (var. o.)

This widespread eastern tree can be confused with *laciniosa* and *carolinae-septentrionalis*; see notes under those species. In Ky. some colls. suggest hybridization with *glabra*, *laciniosa* and perhaps *tomentosa*.

HAB 7,11,10 D 2. **ABU** g10 s10 -2.

0891--*Carya carolinae-septentrionalis* (Ashe) Engl. & Graebn.

Juglandaceae: *Carya* <Apocarya> *carolinae-septentrionalis* (*ovata* var. *australis*)

This occurs locally on base-rich soils in or near southern sections of the Interior Low Plateaus, Ridge and Valley and Piedmont (PL). In Ky. records from TRIG (APSU) and FULT (CW) remain uncertain, but the species is known from Tenn. adjacent to TRIG (Ch). Although this taxon has often been treated as a variety of *ovata*, complete colls. show that it is distinct and intermediates are unknown in Ky.

C. carolinae-septentrionalis differs from *ovata* (FNA 3, W) in its smaller fruits, averaging ca. 2.5-3 cm long (versus 3.5-4 cm); shorter staminate catkins, up to ca. 6 cm (versus 13 cm). Leaflets are generally narrower in shade (the terminal one ca. 2-5 cm versus 6-15 cm), and virtually glabrous (versus pubescent). Terminal buds (6-15 mm long versus 9-18 mm) and twigs (ca. 1-3 mm thick versus 3-6 mm) are less stout, virtually glabrous, maturing or drying to a blackish hue (versus more persistently hairy, brownish).

HAB 11,10,7 D? 2. **ABU** g8 s6 -3.

0892--*Carya tomentosa* (Lam. ex Poir.) Nutt.

Juglandaceae: *Carya* <Apocarya> *tomentosa* ("alba")

This tree is widespread across eastern states, but concentrated on moderately dry, warm sites with a history of burning or browsing. The confused name *C. alba* (L.) Nutt. ex Ell. has been applied in some literature (W), but there is a proposal to reject that name (Ward & Wiersema 2008).

During Virginian settlement of Ky. (Campbell 1989), the common name "white hickory" was applied to this species and to *cordiformis* (bitternut), which does have a distinctly whitish bark, more so than *tomentosa* (mockernut). In the central Bluegrass, Short (1828-9) noted: "*Carya tomentosa* (White heart hickory, Mockernut, &c.). Less common than either of the preceding [*C. ovata*, *C. laciniosa*] in this neighbourhood, and a smaller tree... This is the species so abundant in the barrens of Kentucky where the growth being obstructed by annual fires, whilst the root continues to extend itself, an immense and solid mass is found beneath the soil attached to a bare shrub above it. This species, moreover, is characterized by the large amount of hard, close-grained, white sap-wood which it bears, and which is especially fitted for axe helms and axle-trees. It is thought a superior fuel to all the other hickories."

HAB 7,11,10 C 2. **ABU** g10 s10 -1.

0893--*Carya X ovalis* (Wangenh.) Sarg.

Juglandaceae: *Carya* <Apocarya> *X ovalis* (*glabra* x *ovata*)

These poorly understood trees may result from hybridization of *glabra* and *ovata*. In Ky. they are locally more common than these supposed parents: e.g. on Cumberland Mt. in BELL, and perhaps other relatively cool zones of the state. But FNA 3 included such trees all within a broadly defined, variable *glabra*, within which no segregates were recognized.

C. ovalis has been described (F, Cr, W) as differing from *glabra* in its somewhat scaly or shaggy bark (versus non-shaggy); longer staminate catkins, ca. 10-15 cm long (versus 5-8 cm); fruits of intermediate size and various shapes, with light brown husk that splits to base, and sweet kernel (versus dark brown, closed or tardily splitting, sweetish or somewhat bitter). Less reliable are leaflet number (often reported as usually 7 but not necessarily so in Ky.), pubescence (perhaps more consistently hairy), and other characters (perhaps reddish petioles). *C. ovalis* reportedly includes diploids ($2n = 32$), as in most *Carya* species, plus tetraploids ($2n = 64$), as in *glabra*, *tomentosa* and *pallida*.

HAB 7,11 C? 2. **ABU** g9? s8? -2?

0894--*Carya glabra* (P. Mill.) Sweet

Juglandaceae: *Carya* <Apocarya> *glabra*

This is widespread across eastern states, and its variation needs further study. There may be local introgression with *ovata* (see notes under *X ovalis*), and occasional hybridization with other species (FNA 3; W). Varietal names have not generally been applied within Ky. Expected here is var. *megacarpa* (Sarg.) Sarg., which has relatively large fruits and large terminal leaflets; though mostly known from the southeastern Coastal Plain, it is reported north to s. Ill. (M, W).

HAB 11,7 C 2. **ABU** g10 s10 -1.

0895--*Carya pallida* (Ashe) Engl. & Graebn.

Juglandaceae: *Carya* <Apocarya> *pallida*

This southeastern species occurs mostly on dry sandy soils east of the Mississippi Rv., especially where there is history of frequent fire. Reports from calcareous regions in Ky. (CW) are probably erroneous. See also notes under *texana*.

C. pallida can be difficult to distinguish from *tomentosa* or other species, and some records need checking using more detailed keys (e.g. W). Fruits are typically smaller, ca. 2-4 cm long (versus 3.5-5 cm in *tomentosa*), and distinctively yellowish-lepidote (versus smooth); nuts are less sharply ridged (versus 4-angled), with thinner shells (2-3 mm versus 5-6 mm). Lower leaf surfaces have dense lepidote, peltate scales of varied size and shape (absent in *tomentosa* except for scattered small round scales), appearing silvery when fresh, without hairs (versus densely hairy). Leaflets are typically smaller, but can be unusually large on vigorous sprouts. Terminal buds are smaller, 4-11 mm long (versus 10-20 mm), reddish-brown, with silvery-lepidote scales (versus grayish and pubescent).

HAB 11,10 B 2. **ABU** g9 s8 =.

0896--*Carya texana* Buckl. T

Juglandaceae: *Carya* <Apocarya> *texana*

This is virtually unknown east of the Mississippi River, except in s. Ill. and sw. Ind., where it may intergrade with *pallida* (FNA 3). There are erroneous reports from Ky., apparently based on misidentified *pallida*, but a few colls. from CALL (MUR), HARD (KY), MCRA and elsewhere (M) may be intermediate. *C. texana* differs in the more rusty-brown color of its peltate scales; also, its petioles and rachises are relatively glabrous, without the concentrations of hairs near leaflet insertions, as found in *pallida*.

0897--*Comptonia peregrina* (L.) Coult.

Myricaceae: *Comptonia* [*Myrica*] *peregrina* (M. *asplenifolia*)

This small shrub is widely distributed across northeastern regions. In Ky. it is known only from a few sites on banks of the Rockcastle Rv. and the Big South Fk. of Cumberland Rv.

HAB 1 C 5. **ABU** g10 s2 =.

0898--*Cayaponia quinqueloba* (Raf.) Shinnery

Cucurbitaceae: *Cayaponia* [*Melothria*] *quinqueloba* (*grandifolia*)

This is a high-climbing perennial herb of swamp borders and river banks in southeastern states. It is known from all counties in w. Tenn. and se. Mo. along the Mississippi Rv. (Ch, Y). But the only verified record from Ky. is a recent coll. M. Homoya (WKY) from below Bissell Bluff in LIVI. A supposed coll. of KSNPC from MCLE (R. Hannan & Phillippe #04800) was based on misidentified *Echinocystis lobata* (M).

HAB 4,6 D? 4. **ABU** g8 s2 -2?

0899--*Melothria pendula* L.

Cucurbitaceae: *Melothria pendula*

This is a climbing or scrambling perennial herb of southeastern states. It is widely scattered across southern regions of Ky., usually in weedy roadsides and old fields. It may have spread north after agricultural expansion during recent centuries or millenia.

ALI s. **HAB** r-9,6 ::? C? 4. **ABU** g9 s8 -1?

0900--*Cucurbita foetidissima* Kunth

Cucurbitaceae: *Cucurbita foetidissima*

This scrambling perennial herb is considered native to western North America, and apparently became associated with native people in east-central states. It was perhaps used for ornament, rattles and other minor domestic purposes, but there is no clear evidence of cultivation or selection; see F.B. King in Ford (1985). For Ky. there is only one old record, by B from "along railroad tracks" in JEFF (check US).

ALI w. **HAB** H-10? ::: D? 6. **ABU** g10? s1? -2?

0901--*Cucurbita pepo* L. var. *ovifera* (L.) Alef.

Cucurbitaceae: *Cucurbita pepo* var. *ovifera*

This climbing or scrambling annual originates from southwestern states and Central America. It is the source of the field pumpkin, some squashes (acorn,

scallop) and gourds that do not generally persist after cultivation. The var. *ovifera* ("pear gourd") may not be truly naturalized, but several records of self-seeding plants are mapped here. It was one of the earliest domesticated plants in North America, reaching the central Mississippi and Ohio Valleys ca. 4000-4500 years ago (F.B. King in Ford 1985, Smith 2006).

The var. *melopepo* (L.) Alef. is another old native American cultivar, with a reported coll. from PIKE (MM for WKY). The true pumpkin, *C. mixta* Pang., and the crookneck squash, *C. moschata* (Duschesne ex Lam.) Duschesne ex Poir., are more recent introductions that do not persist in the wild.

ALI SA. **HAB** H-10,6,1? D? 6. **ABU** +4.

0902--*Lagenaria siceraria* (Molina) Standl. W

Cucurbitaceae: *Lagenaria siceraria* (*vulgaris*)

This "bottle gourd" is a climbing or scrambling annual that may have originated in Africa, but has been cultivated widely by mankind and dispersed across the world. It was one of the earliest domesticated plants in North America (Ford 1985); see also citations by M. It is largely tropical to subtropical, and does not persist after cultivation in Ky., but there are records of waifs from MEAD, NELS (DHL) and TRIG (APSU).

ALI AF.

0903--*Citrullus lanatus* (Thunb.) Matsumura & Nakai C

Cucurbitaceae: *Citrullus lanatus* (*vulgaris*)

This scrambling annual is the commonly cultivated watermelon. It does not seem to be persistent in the wild, but occasional plants do establish from discarded (or spat) seeds. Other common crop-plants in this family can be expected in similar contexts, but have rarely been reported (Chester 1992): *Cucumis melo* L. (cantaloupe) and *C. sativus* L. (cucumber).

ALI AF.

0904--*Echinocystis lobata* (Michx.) Torr. & Gray

Cucurbitaceae: *Echinocystis lobata*

This high-climbing annual is widespread across northern and western states, but rare to absent in the southeast (PL, W). It has often been cultivated "for arbors and freely escapes" (F, Cr), but this practice has probably dwindled in modern horticulture. In addition to several old records from Ky., there is a 1985 coll. of P. Dalton Haragan from MARS (KY-Agr.) on a river bottom. A coll. by KSNPC from MCLE ca. 1980 was initially misidentified as *Cayaponia quinquefolia* (M).

HAB r-6,4? :: D? 4? **ABU** g9? s2? -3?

0905--Sicyos angulatus L.

Cucurbitaceae: *Sicyos angulatus*

This high-climbing annual is widespread along edges of riparian woods in eastern states, and it can often spread onto uplands with damp fertile soils.

HAB 4,1,6 :: D 4. **ABU** g10 s10 -2.

0906--Cercis canadensis L.

Fabaceae <Cercideae>: *Cercis canadensis*

This is widespread across southeastern states, especially in thin rocky woods and thickets on dry base-rich soils. Within regions where acid sandy soils predominate, it is generally concentrated in strips along roads made with limestone gravel. Also, it is often planted in Ky. and has spread locally onto the deeper soils of residential areas. *Cercis* is the only simple-leaved legume in eastern North America, and allied with the tropical genus *Bauhinia*.

Cercideae are all woody plants and lack nitrogen-fixation.

HAB 8,12,7,11 D 3. **ABU** g10 s10 -2.

0907--Gymnocladus dioicus (L.) K. Koch

Fabaceae <Caesalpinioideae>: *Gymnocladus dioicus*

This is widely scattered across eastern North America, but generally restricted to highly fertile soils on mesic to submesic sites. Uncertain records mapped here as open dots include a few that may come from planted trees, especially those within Appalachian regions (Gm, CW). Note that the correct spelling may still be *dioica* (Y).

In the central Bluegrass, Short (1828-9) noted that *Gymnocladus* is "...peculiar to the forests of Canada and the western states of North America, in no portion of which is it more commonly met with, or seen in greater perfection than in the immediate neighbourhood of Lexington." Although this landscape is now mostly converted to farmland, the species survives well along woodland edges and fencerows, sometimes colonizing adjacent old fields.

Pods of *Gymnocladus* are relished by cattle, who often consume them during the winter and spring after they fall to the ground; see also Gm. Deposits of seeds can sometimes be found in old barns (LC of ANDE, pers. comm.). Occasional dispersal by other larger mammals is also suspected. In

addition to being generally dioecious, this tree is unusual in its lateral root suckering up to 10 m or more from original stems (especially in males).

HAB 8,7 E 3. **ABU** g8 s8 -3.

0908--Gleditsia triacanthos L.

Fabaceae <Caesalpinioideae>: *Gleditsia triacanthos*

This extends across most of temperate North America, except the northwest. But it is particularly common on base-rich fertile soils, as in the Bluegrass Region of Ky., and generally rare to absent in more hilly non-calcareous regions. Unverified historical data of Gm are mapped here as open dots; his data from Appalachian regions may be doubted, but the species does occur at low density in major valleys throughout most Appalachian regions (PL). The fruits are consumed more or less whole by larger herbivores, including deer (but see Y). See also notes under *aquatica*.

HAB 8,7,10 E 4. **ABU** g10 s9 -2.

0909--Gleditsia aquatica Marsh.

Fabaceae <Caesalpinioideae>: *Gleditsia aquatica*

This is largely restricted to swamps on the southeastern Coastal Plain, extending upstream to bottomlands of the central Mississippi, lower Ohio and lower Wabash rivers (PL). In Ky. there are several old or uncertain records that need verification, including those of Gm as far as TRIM. Without fruit, *aquatica* can be hard to distinguish from *triacanthos*, which occasionally occurs along the margins of swamps. Hybrids appear to occur in several areas across the range (Y), including Ky.

HAB 9,3 D? 4? **ABU** g8 s5 -2.

0910--Senna obtusifolia (L.) Irwin & Barneby

Fabaceae <Caesalpinioideae>: *Senna* [Cassia] *obtusifolia* (C. tora)

This is a widespread annual weed in pantropical to warm-temperate regions. Its native or alien status in the Ohio Valley remains uncertain. Under old synonyms, there are early Ky. records from Short (1833) and Rafinesque (1836a); and B noted a coll. of Short from "barrens of Ky." at Univ. of Cincinnati.

S. occidentalis (L.) Link is another weedy annual that may be expected in Ky. It has a similar range but is relatively infrequent or rare to the north (PL). **ALI** s. **HAB** H-10 :::: C? 6. **ABU** g10 s8 +2?

0911--Senna marilandica (L.) Link

Fabaceae <Caesalpinioideae>: *Senna* [Cassia] *marilandica*

This is widespread across eastern states south of the Great Lakes, especially in thin woods, riparian zones, old fields and roadsides on seasonally damp, base-rich soils. It is sometimes confused with *hebecarpa*, but there is no evidence of hybridization here or elsewhere (Y).

HAB f-10,8,6,4 D 4. **ABU** g10 s10 -2?

0912--*Senna hebecarpa* (Fern.) Irwin & Barneby

Fabaceae <Caesalpinioideae>: *Senna* [Cassia] *hebecarpa*

This northeastern species occurs across much of the Ohio Valley, especially on lowlands with medium-acid soils. It appears to be generally rare in Ky. and Tenn.; it is virtually unknown in Mo., Ark., Miss. and Ala. However, without fruits, there has been some confusion with *marilandica*, which tends to occur on more base-rich soils. In addition to its somewhat distinctive clavate-obovate (versus more rounded) petiolar glands, *hebecarpa* is usually more hairy than *marilandica* (F); stems are sparsely villous above (versus glabrous or nearly so). Included here is the particularly hairy var. *longipila* E.L. Braun, with its type coll. from KNOT (GH).

HAB f-9,6,10,8 C 4. **ABU** g9 s4 -4.

0913--*Chamaecrista fasciculata* (Michx.) Greene

Fabaceae <Caesalpinioideae>: *Chamaecrista* [Cassia] *fasciculata*

This variable species is widespread across eastern states. Its numbers have generally been boosted by plantings for reclamation or wildlife. Despite little or no development of rhizobial nodules on roots, there is more potential to fix nitrogen in this genus than in most other Caesalpinoids (Bryan et al. 1996).

Colls. from NELS, WOOD (KY) and elsewhere are referable to var. *robusta* (Pollard) J.F. MacBr., but that taxon is not generally recognized in recent treatments. Its type is a coll. of C.W. Short from "Mountains of Kentucky" (NY).

HAB f-10 ::: C 6. **ABU** g10 s10 +2?

0914--*Chamaecrista nictitans* (L.) Moench

Fabaceae <Caesalpinioideae>: *Chamaecrista* [Cassia] *nictitans* (var. n.)

This is a variable widespread species, extending from eastern U.S.A. to South America. But in most of its northern range only var. *nictitans* has generally been recognized by recent authors (e.g. Y, W). Included here is var. *leiocarpa* Fern., which was reportedly collected in BELL (B).

HAB f-10,12 ::: C 6. **ABU** g10 s10 +2?

0915--*Albizia julibrissin* Durazz.

Fabaceae <Mimosoideae>: *Albizia* *julibrissin*

This weedy nitrogen-fixing tree from subtropical Asia is a widespread invasive species in southeastern states. Some records mapped here may come from planted trees, but it is clearly naturalized in many areas, especially on medium-acid soils. Though widely cultivated and naturalized in more southeastern states before 1840 (Rafinesque 1836, 1:41), the first published record for Ky. was in 1950 (F). B did not record it during her extensive field work during 1920-1950, including many parts of Appalachian regions where the species is now so common.

ALI AS. **HAB** f-8,10 C 4. **ABU** +6*.

0916--*Mimosa quadrivalvis* L.

Fabaceae <Mimosoideae>: *Mimosa* (*Schrankia*) *microphylla* (*quadrivalvis** var. *angustata*; "S. *uncinata*")

This southeastern "sensitive brier" has often been treated as a variety of *M. quadrivalvis* L., along with several other taxa across North America. *M. microphylla* is closely related to *M. nuttallii* (DC. ex Britton & Rose) B.L. Turner, which is disjunct in central states (PL). Typical *quadrivalvis* occurs in Tex. *M. microphylla* is now largely restricted to rights-of-way, but may have spread more into woodlands on sandy uplands when burned and browsed along trails before settlement. This plant has a curious combination of high palatability, before prickles develop, and sensitive folding leaflets. Crossing the Cumberland Plateau in 1867, John Muir (1916) noted: "...I found that *Schrankia* vines growing along foot-paths leading to a backwoods schoolhouse were much less sensitive than those in the adjacent unfrequented woods, having learned to pay but slight attention to the tingling strokes they get from teasing scholars."

HAB f-10,12,1 ::? C 5. **ABU** g8 s8 -3.

0917--*Desmanthus illinoensis* (Michx.) MacM. ex B.L. Robins. & Fern.

Fabaceae <Mimosoideae>: *Desmanthus* *illinoensis*

This widespread variable species extends from the Rockies to the Atlantic but is most common in the Great Plains and midwest. In Ky. it is locally abundant on banks along the Ohio River and larger tributaries. It is much less common inland, but does appear to be native in some remnants of native grassland or open woodland along smaller streams and on adjacent uplands with base-rich soils. Some plants along rights-of-way may be adventive. D considered the species largely adventive in Ind. and Ohio, but Riddell listed it for Ky. as

early as 1835. Recent local increases might have been allowed by reduction in livestock or deer, especially in developed lowlands or suburban areas where browsing previously limited the species.

D. illinoensis is well-known to be preferred forage by ungulates (e.g. Gm; Schweitzer et al. 1993; R. Seymour, pers. comm.), and its seeds are avidly consumed by several birds and mammals. Its common nitrogen-fixing bacterium is a newly described species that is also important in some beans and peanuts (Beyhaut et al. 2006).

HAB f-1,10 ::? D 5. **ABU** g10 s8 -1?

0918--*Cladrastis kentukea* (Dum.-Cours.) Rudd

Fabaceae <F-Sophoreae>: *Cladrastis kentukea* (lutea)

This ancient relictual species occurs in scattered disjunct localities of east-central states, mostly in the Ozark region and around the southern Appalachians. Most Appalachian trees tend to have much larger maximum size (often 5-7 dm dbh versus only 2-4 dm elsewhere) and more stump sprouting, but there are no clear differences in flowers or fruits (M. Vincent, pers. comm.). As in most Caesalpinoids but unlike almost all other Faboids, *Cladrastis* lacks nitrogen-fixing rhizobial nodules (Graves & Van de Poll 1992).

In Ky. there are two main clusters of records: (1) in the central Kentucky River Palisades; (2) in southeastern mountains or adjacent bluffs. Several outlying records are unverified, including some from Gm. W.S. Bryant showed JC a small tree at Boone County Cliffs Preserve, but it disappeared during the 1980s; other records from n. Ky. are old or uncertain (KENT, PEND). Further field work is needed in western regions. The record from TODD (Little 1971) remains unconfirmed, but *Cladrastis* is known from adjacent Tenn. along bluffs of the Red Rv. in Montgomery Co. (Ch). Plants in the loess bluffs of FULT (MUR) have not been relocated in recent decades, but *Cladrastis* does extend south along such bluffs to La. and Miss.

HAB 5,11 +\ D 3. **ABU** g8 s7 =.

0919--*Baptisia leucophaea* Nutt.

Fabaceae <F-Thermopsidae>: *Baptisia leucophaea* (bracteata* var. 1.)

In Ky. this midwestern species is largely restricted to remnants of thin woodland and grassland on the gravelly eastern margins of the Mississippian Embayment. Record mapped here include var. *glabrescens*, which is often

mixed with typical plants and does not seem worth distinguishing. There has been some confusion with *leucantha*.

HAB r-10,7 B 4. **ABU** g8 s6 -3.

0920--*Baptisia tinctoria* (L.) R. Br. ex Ait. f.

Fabaceae <F-Thermopsidae>: *Baptisia tinctoria*

This occurs mostly on sandy soils in Appalachian and east-coastal regions, from Me. to Ga. plus scattered localities in the Great Lakes region. The disjunct coll. from TODD (steep wooded SW-facing slope, Ky 181 2.6 mi S of Ky 107) is one of only two records from the Interior Low Plateaus. The other is from Maury Co. of c. Tenn. (Ch).

HAB r-10,7 B 4. **ABU** g10 s3 -4.

0921--*Baptisia australis* (L.) R. Br. ex Ait. f. var. *australis*

Fabaceae <F-Thermopsidae>: *Baptisia australis* var. a.

Before artificial dams and impoundments, this species was formerly widespread and locally abundant along several larger streams and rivers of east-central states. In Ky. it is now common only along rocky banks of the upper Cumberland River system. Records from FRAN and GARR are historical references without known colls. M. Bender discovered a plant on banks of the Kentucky River in MERC, which is the only one known to remain in that watershed. A piece of this plant was taken for cultivation by JC; it flowers about two weeks later, in the same garden, than plants from the Cumberland River drainage.

HAB 1 + C 5. **ABU** g8 s6 -2.

0922--*Baptisia australis* (L.) R. Br. ex Ait. f. var. *aberrans* (Larisey) M. Mendenhall

Fabaceae <F-Thermopsidae>: *Baptisia australis* var. *aberrans*

This taxon of calcareous glades in southeastern states appears somewhat intermediate between typical *australis* and *B. minor* Lehm., a more western species (W). The coll. from HARD (KSNPC) appears transitional to *australis*. Given the striking disjunction in habitat from typical *australis* (on rocky river banks), variety status may not be sufficient (W). A parallel situation exists in *Physostegia praemorsa* versus *P. virginiana*.

HAB 12 + D 5. **ABU** g5 s2 -2.

0923--*Baptisia leucantha* Torr. & Gray

Fabaceae <F-Thermopsidae>: *Baptisia leucantha* (lactea; alba* var. *macrophylla*)

This midwestern species has been confused with typical *B. alba* (L.) R. Br., which does not occur in Ky. but has been sometimes introduced from southeastern states as a supposed wildflower. There has also been confusion with *leucophaea*, which has a similar range but occurs on poorer soils. In Ky. *leucantha* occurs mostly in western regions on base-rich soils, often on dry uplands with remnants of native grassland, but sometimes also on lower ground in thin woods bordering swamps. The record from CAMP is probably correct, but it is just a sight record of R. Naczi (pers. comm.).

HAB r-10,9,7,6 C 4. **ABU** g9 s7 -4.

0924--*Thermopsis mollis* (Michx.) M.A. Curtis ex Gray

Fabaceae <F-Thermopsidae>: *Thermopsis mollis*

This occurs mostly on the Piedmont from Va. to Ga., with only scattered records in Appalachian regions further west. In Ky. there are two localities in thin upland woods of CLAY, especially along one US Forest Service road. It has also been recently found in an old-field of MADI, where seed might have been introduced with "wildflower" sowings (Poindexter & Thompson 2008; G. Dandeneau, pers. comm.).

HAB 11,7 B 4. **ABU** g7 s2 -2.

0925--*Thermopsis villosa* (Walt.) Fern. & Schub.

Fabaceae <F-Thermopsidae>: *Thermopsis villosa*

This largely southern Appalachian species was discovered by J. Thieret on a roadside at the head of the Green Rv. valley in CASE (KNK). It appeared native at this locality, but *villosa* is sometimes cultivated and can escape. Its original range and habitats remain somewhat mysterious (W).

HAB r-7,6? C 4? **ABU** g7 s2? -2?

0926--*Crotalaria sagittalis* L.

Fabaceae <F-Crotalariaeae>: *Crotalaria sagittalis*

This annual is scattered widely across eastern states and Central America, but probably just adventive in northern states. In Ky. it has sometimes been misidentified as *C. purshii* DC., which occurs further south (M).

HAB H-10? ::? C 6? **ABU** g10 s8 -2?

0927--*Crotalaria spectabilis* Roth W

Fabaceae <F-Crotalariaeae>: *Crotalaria spectabilis*

In Ky. there is only one record for this largely tropical weed: an old coll. from TAYL (BEREA, KY-Agr.).

ALI AS. **HAB** H-10? ::? D? 6? **ABU** +4.

0928--*Cytisus scoparius* (L.) Link C

Fabaceae <F-Genisteae>: *Cytisus scoparius*

This potentially invasive shrub has been reported from Ky., probably just based on cultivated material (Gm, RAB, M). But it is locally naturalized on the Cumberland Plateau in Tenn. (Ch).

ALI EU.

0929--*Lupinus perennis* L. C

Fabaceae <F-Genisteae>: *Lupinus perennis*

This occurs mostly in sandy soils near the Great Lakes and down the Atlantic Coastal Plain. In Ky. it has only been collected from a roadside planting in ROCK (BEREA). Some European species of *Lupinus* (*albus*, *hirsutus*, *luteus*) were tried for forage a century ago at the Univ. of Ky. with varied success, but none became widely used or naturalized (Gm).

ALI N.

0930--*Astragalus distortus* Torr. & Gray R

Fabaceae <F-Galegeae>: *Astragalus distortus*

Typical *distortus* is centered in Ozarkian regions from Okl. to Ill., including records from se. Mo. close to Ky. (PL). There are also disjunct plants in the shale-barrens of W.Va., Va. and Md. (W). The species was reported by McFarland (1942) from Ky., but any claimed coll. was presumably burned in 1948.

0931--*Astragalus canadensis* L.

Fabaceae <F-Galegeae>: *Astragalus canadensis*

This variable species is widely scattered in varied habitats across North America, but it is uncommon to rare in most eastern states (NS). In Ky. most records date from before 1950, and there are only 3 or 4 records from after 1980. Most of these plants may be referable to the eastern var. *carolinianum* (L.) M.E. Jones, which has a more open raceme. Typical var. *canadensis* is centered in the Mississippi Valley (Barneby 1964). However, this taxonomic distinction may be unclear, and it is not accepted in most recent treatments (Isely 1990; K, W).

HAB r-7,8,11,1 ::? C 4. **ABU** g10 s4? -5.

0932--*Trifolium arvense* L.

Fabaceae <F-Trifolieae>: *Trifolium* <*Trifolium*> *arvense*

This annual clover ("rabbit-foot") has not become widely used for forage. Most records date from 1893 (Pr) to 1943 (B). In 1914, Gm noted it was "common on rather poor soils" in western regions, but it has apparently declined in recent decades.

ALI EU. **HAB** G-10 :::: C 6? **ABU** +5<.

0933--Trifolium incarnatum L.

Fabaceae <F-Trifolieae>: Trifolium <Trifolium> incarnatum

This annual produces showy, productive forage ("crimson clover"), and has been widely grown since trials at the Univ. of Ky. ca. 1900 (Gm). It is somewhat persistent and perhaps locally naturalized in several areas, but several colls. mapped here may just come from plantings.

ALI EU. **HAB** F-10 :::: C 6. **ABU** +5.

0934--Trifolium pratense L.

Fabaceae <F-Trifolieae>: Trifolium <Trifolium> pratense

In Ky. this commonly sown short-lived perennial ("red clover") has been widely used for forage and hay since early settlement (Gray 1864). It became a favorite of farmers well before 1900 (Gm), and many selections have been made. *T. medium* L. ("mammoth clover") is a closely related polyploid ($2n =$ mostly 48-80 versus usually 14 in others of section *Trifolium*). It has been reported from Ky., at least in plantings (Linney 1880; Gm), but it does not appear to have become established.

ALI EU. **HAB** F-10 :: D 5. **ABU** +6.

0935--Trifolium resupinatum L. C

Fabaceae <F-Trifolieae>: Trifolium <Vesicaria> resupinatum

This Mediterranean annual has distinctive, inverted rose-purple flowers ($2n =$ 16). It has been widely tried for forage across North America, but it is not generally common except in the lower Mississippi Valley (PL). For Ky. the only record is an old coll. from METC (KY-Agr.) that has been mislaid (M).

ALI EU.

0936--Trifolium reflexum L.

Fabaceae <F-Trifolieae>: Trifolium <Lotoidea> reflexum

This winter annual or biennial is secure in some southeastern states (especially Tex. to S.C.), but it is now endangered in Ky. and elsewhere in the Ohio Valley (Campbell et al. 1989). Despite having largely disappeared from the northern half of its range, there has been little organized effort to propagate and recover reflexum. In s. Ind. (Perry & Posey Cos., pers. comm from M.

Homoya) just two populations are known in burned post oak woods; in s. Ohio (Pike Co., pers. comm from D. Boone) just one population is known, also in a burned woods.

In Ky. reflexum was widely scattered in western and central regions, but it became rare by 1900 (Gm). Some uncertain records mapped here are based on historical references. After 1970 it has been found in just two localities: (1) near Mammoth Cave (EDMO), in hills between the formerly burned "Big Barrens" on the karst plain and the Green Rv.; (2) on a reforestation terrace of the lower Green Rv. in HOPK (Hal Bryan, 1984). Hussey (1876) noted: "occurs in several localities between the railroad and Mammoth Cave. I mention it because I have never found so many specimens in any one locality before, and also to make a note of the fine rose-pink color it everywhere had."

Variation in leaf markings (with distinct 'chevrons' more frequent to the south), pubescence (which is absent in related species), and in flower color (red, yellow or white) needs further study. The midwestern var. *glabrum* Loja may be distinct in its lack of leaf markings, thinner pubescence and paler flower color. Some colls. from Ky. (HOPK, LYON) and perhaps all from Ind. have white flowers.

HAB r-7,10,11,12 :::: C 4. **ABU** g7? s2 -5.

0937--Trifolium sp. nov. (aff. reflexum)

Fabaceae <F-Trifolieae>: Trifolium <Lotoidea> sp. nov. (aff. reflexum)

A few plants of this unusual clover were discovered along Clear Cr. in se. WOOD by Joe Lacefield (Ky. State Dept. of Fish & Wildlife) during 2010. It is clearly close to typical reflexum but differs in being unusually prostrate and early flowering (ca. 5-25 May versus 23 May-31 Jul for reflexum in Ky.). Also, flowers are creamy white (resembling stoloniferum) and leaves lack any 'chevron' markings. While reflexum usually occurs in woods on moderately dry or infertile (often sandy) soils, the habitat in WOOD is browsed eutrophic woods more typical of stoloniferum, though with rather thin rocky soil on limestone. M. Vincent (pers. comm.) is studying variation within native clovers, and indicates that our plant is probably a distinct undescribed taxon.

HAB 7,11,12? :::: E? 3. **ABU** g2? s2? -5?

0938--Trifolium stoloniferum Muhl. ex Eat.

Fabaceae <F-Trifolieae>: Trifolium <Lotoidea> stoloniferum

More collections are needed to document this enigmatic globally threatened species, which appears to have been widely scattered in the Ohio Valley

before settlement, with some western extensions into edges of the Great Plains (Brooks & Freeman 1989). Plants have been found in at least 100-200 disjunct localities across its range since 1984, but mostly in small and somewhat ephemeral patches. In Ky. it appears to have been formerly common in browsed upland woods (with no evidence of fire), especially on suitable soils of the Bluegrass region. Some uncertain records mapped here are just historical references or sight records. It now survives mostly in mowed woods (old yards or parks), along old trail margins, and at associated streambank crossings.

T. stoloniferum is dependant on the right combination of damp fertile soil, partial shade, and frequent disturbance of vegetation with bared soil (Campbell et al. 1989). Despite federal listing as an "Endangered Species" since 1985, no populations appear to have come under stabilizing management, and there is continued reticence by conservationist agencies to use ungulates in management.

HAB 7,4,6 ::: E 3. **ABU** g5 s4 -5.

0939--*Trifolium hybridum* L.

Fabaceae <F-Trifolieae>: *Trifolium* <Lotoidea> *hybridum*
Although tried for forage production in Ky. ca. 1894-1914, this short-lived perennial ("alsike clover") did not prove useful (Gm). However, since then it has spread widely into farmland and roadsides around the state.

ALI EU. **HAB** R-10 ::: D 6? **ABU** +5.

0940--*Trifolium repens* L.

Fabaceae <F-Trifolieae>: *Trifolium* <Lotoidea> *repens*
This common stoloniferous forage ("white clover") has been present in Ky. since early after settlement. Counties reported by Vincent (2001) are provisionally included (as for other *Trifolium* spp.), but his collection data need to be checked. *T. repens* is highly variable; 2n = 16, 28, 32 or (?) 64 versus just 16 in other *Lotoidea* here. The large form known as "Ladino Clover" (forma *giganteum* Lagr.-Foss) is widely sown, and often appears quite distinct from typical plants. Although pastures are often "improved" with fresh sowings, regular mowing or grazing will generally promote the species, and after unusually snowy winters it becomes especially vigorous, as in 2010.

ALI EU. **HAB** G-10,7 ::: D 5. **ABU** +6.

0941--*Trifolium campestre* Schreb.

Fabaceae <F-Trifolieae>: *Trifolium* <Chronosemium> *campestre* (agreste, "procumbens")

This annual ("low hop-clover") is widespread across North America (2n = 14). In Ky. it has been common in pastures for over a century (Gray 1864; Gm).

ALI EU. **HAB** F-10 :: D 5. **ABU** +6.

0942--*Trifolium dubium* Sibthorp

Fabaceae <F-Trifolieae>: *Trifolium* <Chronosemium> *dubium*
This small, variable relative of *campestre* is widespread across North America (2n = 16, 28, 32). It is probably more frequent in Ky. than colls. indicate.

There has been some confusiuon with *campestre* and even *Medicago lupulina*.

ALI EU. **HAB** R-10 :: D 5. **ABU** +5.

0943--*Trifolium aureum* Pollich

Fabaceae <F-Trifolieae>: *Trifolium* <Chronosemium> *aureum* ("agrarium")
This large showy relative of *campestre* is established across northern North America (2n = 16). In Ky. it was reported as early as 1893 (Pr), but it has remained much less frequent. In 1914, Gm did not list it.

ALI EU. **HAB** F-10 ::: D 6? **ABU** +4.

0944--*Melilotus indica* (L.) All.

Fabaceae <F-Trifolieae>: *Melilotus* *indicus*
This Mediterranean annual is well-established in Pacific states but uncommon to rare in eastern states (PL, W). The only record for Ky. is a coll. in 1969 from HICK (DHL).

ALI EU. **HAB** R-10 :: D? 5. **ABU** +4.

0945--*Melilotus officinalis* (L.) Lam.

Fabaceae <F-Trifolieae>: *Melilotus* *officinalis*
This is widespread across North America, but less successful in relatively warm or dry regions compared to *albus* (see notes under that species). In Ky. *officinalis* has been frequent for at least a century, especially along roadsides; there is no record of cultivation (Gm).

ALI EU. **HAB** R-10 :: D 5. **ABU** +6*.

0946--*Melilotus albus* Medik.

Fabaceae <F-Trifolieae>: *Melilotus* *albus*
This biennial or annual is widely established across North America. In Ky. it has been common for a century or more, especially along roadsides and in rocky old fields. Though not generally cultivated, Gm noted: "I believe it is

sometimes planted for bee pasture." *M. albus* is close to *officinalis*, but differs (Isely 1998, W) in its white flowers (versus yellow), ca. 3.5-5 mm long (versus 5-7 mm), the wing petals about as long as the keel (versus generally longer). In Ky. *albus* mostly flowers later (Jun-Jul versus May-Jun) and occurs in drier sites. The spelling "alba" is incorrect for the epithet (W).
ALI EU. **HAB** R-10,12 :: D 5. **ABU** +6*.

0947--*Medicago sativa* L.

Fabaceae <F-Trifolieae>: *Medicago sativa*

This valuable crop (the common "alfalfa") has been widely grown in Ky. for hay and forage since the 1890s (Gm). Many colls. mapped here probably are from persistent plantings in old fields, rather than from secondary establishment by seed. The few reports of ssp. *falcata* (L.) Archang. ("yellow alfalfa") are all from cultivated plants.

ALI EU. **HAB** F-10 :: D 5. **ABU** +6.

0948--*Medicago lupulina* L.

Fabaceae <F-Trifolieae>: *Medicago lupulina*

This widespread biennial or annual weed ("black medic") has been common in Ky. since before 1902, when Gm noted: "used extensively for the adulteration of red clover seed, which may account for the frequent appearance of plants in cultivated ground."

ALI EU. **HAB** S-10,7 :: D 6. **ABU** +6.

0949--*Medicago arabica* (L.) Huds. R

Fabaceae <F-Trifolieae>: *Medicago arabica*

This was reported from Ky. by RAB but no voucher has been located. F indicated a wide distribution in North America, but Cr did not include the species.

ALI EU.

0950--*Lotus corniculatus* L.

Fabaceae <F-Loteae>: *Lotus corniculatus* (var. c.)

This low spreading perennial become widely promoted for forage in North America after 1950 (F), especially in northern regions (Cr), but it remains uncommon in wamer regions of the southeast (W). In Ky. it was first recorded as a wild plant in 1992 (BA; Chester 1992), and it been much used since then for showy roadside plantings, often spreading into nearby mowed areas. There is also a coll. labelled *L. tenuis* Waldst. & Kit ex Willd. (= *L. corniculatus* var. *tenuifolius*) from a stripmine in BREA (DHL), perhaps established from sown

seed. Curiously, *Lotus* spp. were not used in early forage trials at the Univ. of Ky. ca. 1890-1900 (Gm). The related *Anthyllis vulneraria* L. was tried and recommended but did not become naturalized.

ALI EU. **HAB** R-10 :: D 6. **ABU** +5.

0951--*Securigera varia* (L.) Lassen

Fabaceae <F-Loteae>: *Securigera* [*Coronilla*] *varia*

This aggressive rhizomatous plant from Mediterranean Europe has become widely sown for stabilizing ground in eastern states, especially along newly constructed roads. In Ky. some records may be from persistent plantings, but the species does often spread by seed as well as rhizomes. Although it has been generally known as *Coronilla varia* L., the segregated genus *Securigera* has become widely applied in recent years (W, PL).

ALI EU. **HAB** R-10 :: D 5. **ABU** +6*.

0952--*Orbexilum onobrychis* (Nutt.) Rydb.

Fabaceae <F-Psoraleae>: *Orbexilum* [*Psoralea*] *onobrychis*

This locally competitive herb with spreading roots is known from the central Mississippi Valley to lowlands around the southern Appalachians, but it is generally rare. It is most frequent in remnants of tall brushy grassland from e. Mo. to c. Ohio, but even there it is largely restricted to patches that have not been intensively farmed. It appears sensitive to continual effects of livestock. In Ky. it may have declined rapidly after settlement, since the only original record before 1900 is from Short (1840). He noted: "in thickets among the barrens; rather rare." Remnants are concentrated along old fencerows on lowlands adjacent to the western edge of the Appalachians. Several globally rare insects feed on this plant (e.g. A. Braun 1930; L.D. Gibson, pers. comm.).

HAB r-10,8,7 :: D 4. **ABU** g7 s5 -5.

0953--*Orbexilum stipulatum* (Torr. & Gray) Rydb.

Fabaceae <F-Psoraleae>: *Orbexilum* [*Psoralea*] *stipulatum* (congesta)

This relative of *onobrychis* may be globally extinct. It was known only from "islands of the Ohio River" near New Albany (Ind.), especially Rock Island at the Falls (Baskin et al. 1986). Rock Island was largely destroyed during the early 20th Century, in connection with lock-and-dam construction. However, further searching is warranted along nearby banks of the river and tributaries draining native grassland, e.g., up the Salt River to the Cedar Grove area in BULL and along the Blue Rv. in Ind.

HAB 1 :: D? 5? **ABU** g0 s0 -6.

0954--*Orbexilum pedunculatum* (P. Mill.) Rydb. var. *pedunculatum*

Fabaceae <F-Psoraleae>: *Orbexilum* [Psoralea] *pedunculatum* var. p. (P. psoralioides var. *eglandulosa*)

This is a widespread southeastern species of thin dry woods and openings on acid soils. The typical variety mapped here occurs mostly west of the Appalachians. See notes under var. *psoralioides*.

HAB r-10,7 ::? B 5. **ABU** g9 s9 -3.

0955--*Orbexilum pedunculatum* (P. Mill.) Rydb. var. *psoralioides* (Walt.)

Isely

Fabaceae <F-Psoraleae>: *Orbexilum* [Psoralea] *pedunculatum* var. *psoralioides* (P. *gracile*)

This generally distinct segregate occurs mostly on the Atlantic Coastal Plain. It is more glandular in inflorescence and leaves, and the calyx has shorter teeth and shorter hairs; see W for a detailed key. In Ky. it is known only from sandy river banks and uplands of MCRE (KY) and WHIT (MM-JC). Further search is needed in the field and herbarium.

HAB r-1,10,7 ::? B 5. **ABU** g7 s6 -3?

0956--*Psoralidium tenuiflorum* (Pursh) Rydb.

Fabaceae <F-Psoraleae>: *Psoralidium* [Psoralea] *tenuiflorum*

This occurs mostly in the Great Plains, and is virtually unknown in eastern states. In Ky. the only record is Cranfill's coll. (1991) from a calcareous glade of HARD (KY). The coll. matches var. *floribunda* (Nutt. ex Torr. & Gray) Rydb. (within *Psoralea*), a robust form not recognized in recent treatments. Plants have disappeared at the site, perhaps due to additional collecting by fabophiles. *P. tenuiflorum* is a "wild alfalfa" with deep, spreading, edible roots that may promote association with buffalo wallows and other animal disturbance (Gibson 1989).

HAB 12,10 ::? D? 5. **ABU** g9 s1 -6?

0957--*Amorpha fruticosa* L.

Fabaceae <F-Amorpheae>: *Amorpha fruticosa* [including var. *tennesseensis*]

Broadly defined, this species is widespread across temperate North America. In Ky. it is generally restricted to the banks of rivers and sloughs with some degree of opening. Uncertain records mapped as open dots may result from plantings; details of context are sometimes missing from colls. Beyond its native habitat, this species was already "common in cultivation" a century ago (Gm), and it is still being widely planted.

Segregates of *fruticosa* have not been recognized in recent treatments but deserve further study (Sm, F, St). Most colls. from Ky. have relatively numerous and narrow leaflets, more or less matching the southern var. *tennesseensis* (Shuttl. ex Kuntze) Palmer. Some of the colls. from MCRE and PULA (KY) match var. *fruticosa*, which is widely reported but perhaps centered in eastern and northern states. See also *croceolanata* and *nitens*.

HAB 1,2? D? 4. **ABU** g9 s8 -1?

0958--*Amorpha croceolanata* Wats.

Fabaceae <F-Amorpheae>: *Amorpha croceolanata* (*fruticosa* var. c.)

This is centered in the lower Mississippi Valley, and occurs on base-rich soils along relatively small streams, often persisting in partial shade (based on published descriptions and colls. at APSU, MO, TENN, etc.). Colls. from LYON (APSU), MARS (MO, WKY), MCRA (MO) and probably elsewhere in Ky. are referable to this taxon. It was treated by Sm and Gl as a species; by F as *A. fruticosa* var. *croceolanata* (P.W. Wats.) P.W. Wats. ex Mouille. Although largely distinct from typical *fruticosa* of Ky. and Tenn., it may intergrade in some areas.

Compared to *fruticosa*, *croceolanata* has fruits with hort stramineous hairs (versus glabrous), and tend to have fewer prominent glands or sometimes none (versus distinct). Its leaflets are usually less numerous, larger (mostly 2.5-6 x 1-4 cm versus 1.5-4 x 0.5-1.5 cm), and less elongated (l/w 2-2.5 versus 2.5-3). Their lower surfaces, as well as young stems, have dense to scattered, long-sinuuous spreading, pale stramineous hairs (versus more short-appressed, greyish hairs or glabrate); they are not clearly glaucous (versus often glaucous), and tend to have fewer prominent glands or sometimes none (versus consistently prominent). Mature, flowering stems are generally shorter (mostly 1-2 m versus 1.5-5 m).

HAB 6,7? D? 3. **ABU** g7? s2? -1?

0959--*Amorpha nitens* Boynt.

Fabaceae <F-Amorpheae>: *Amorpha nitens* (?*cyanostachya*)

This is a rather poorly known species, interpreted by Isely (1998) and other recent authors as centered in the lower Mississippi Valley, but especially distinct in the Ozarks. It usually occurs on less intensely flooded sites than *fruticosa* (often drier, sandier or rockier). This interpretation includes *A. cyanostachya* M.A. Curtis; but see Sm for a more divisive treatment. *A. nitens* is easily confused with *fruticosa* or *croceolanata* and often overlooked; see W and citations.

Plants of nitens tend to become darker to blackish when dried (versus greenish to brownish in other members of the fruticosa group). Leaflets are usually more glossy above when fresh, spreading hairy to glabrate and often less clearly glandular below, and usually less mucronate; also, they tend to be relatively large and broad (l/w ca. 2-2.5), with only 9-15 per leaf (versus 11-23 in most fruticosa). Fruits are usually glabrous, and have been described as "dotless or essentially so" (F) but can often be distinctly dotted with glands. The largely southern Appalachian species, *A. glabra* Poirlet, is uncomfortably close to nitens but usually with distinctive, short to obsolete calyx lobes; leaflets are less blackening, more retuse and less mucronate. Plants in c. Tenn. may appear transitional from nitens to glabra (Ch, PL; D. Estes, pers. comm.).
HAB 6,9? C? 4. **ABU** g7? s3? -2.

0960--*Dalea candida* Michx. ex Willd.

Fabaceae <F-Amorpheae>: *Dalea* <Petalostemon> *candida*
This is centered in the Great Plains extends locally into eastern states. In Ky. it is largely restricted to remnants of dry calcareous grassland in or near the Big Barrens, and along the western Knobs.
HAB 12,10 ::? E 5. **ABU** g9 s6 -4.

0961--*Dalea purpurea* Vent.

Fabaceae <F-Amorpheae>: *Dalea* <Petalostemon> *purpurea*
This has a similar range to *candida*, centered in the Great Plains. These species overlap much in habitat, but *purpurea* appears to be most common on sites that are somewhat damper early in the growing season. Although there are fewer localities in Ky., *purpurea* is still locally abundant in some remnants of grassland that have been disturbed but not intensively farmed.

D. foliosa is a distinct species that is expected in Ky. It occurs mostly in calcareous glades of Ala. and Tenn., but also in Ill. and Wis. (Isley 1998, K).
HAB 10,12 ::? D 5. **ABU** g9 s5 -4.

0962--*Hylodesmum nudiflorum* (L.) H. Ohashi & R.R. Mill

Fabaceae <F-Desmodieae>: *Hylodesmum* [*Desmodium**] *nudiflorum*
In Ky. this widespread eastern species is largely restricted to woods on mesic-subxeric sites with medium-acid soils. These are usually "average" oak-hickory woods, potentially dominated by *Quercus alba*.
HAB 11,7,5 C 2. **ABU** g10 s10 -2.

0963--*Hylodesmum glutinosum* (Muhl. ex Willd.) H. Ohashi & R.R. Mill
Fabaceae <F-Desmodieae>: *Hylodesmum* [*Desmodium**] *glutinosum* (*acuminatum*)

This is widespread across eastern North America in woods somewhat similar to *nudiflorum* but typically on more mesic, fertile soils.

HAB 5,11 D 1. **ABU** g10 s9 -3.

0964--*Hylodesmum pauciflorum* (Nutt.) H. Ohashi & R.R. Mill

Fabaceae <F-Desmodieae>: *Hylodesmum* [*Desmodium**] *pauciflorum*
This widespread southeastern species occurs in woods on relatively moist and fertile soils, especially in trails and other areas with disturbance on the ground.
HAB 7,5 ::? D 3. **ABU** g10 s9 -3.

0965--*Desmodium ochroleucum* M.A. Curtis ex Canby R

Fabaceae <F-Desmodieae>: *Desmodium* <Stipulata> *ochroleucum*
This is a globally rare species of dry calcareous woodland in southeastern states, mostly east of the Mississippi Rv. It is distinctive in the field, with creamy flowers and creeping habit. The only Ky. record is an unverified report from RAB, with no coll. located. There are verified records from adjacent Montgomery Co. in Tenn. (Ch) and nearby in se. Mo. (St).

0966--*Desmodium rotundifolium* DC.

Fabaceae <F-Desmodieae>: *Desmodium* <Stipulata> *rotundifolium*
This is widespread across southeastern states, usually in thin woods and grassy transitions on dry acid soils.
HAB f-7,10,11 :: C 4. **ABU** g10 s10 -2.

0967--*Desmodium canescens* (L.) DC.

Fabaceae <F-Desmodieae>: *Desmodium* <Stipulata> *canescens*
This is a widespread, weedy species of eastern states. In Ky. it is locally common in farmland and roadsides, especially on sandy lowlands, but generally absent in the Bluegrass region. It has relatively long, branching roots that sometimes form extensive clonal patches. The related midwestern species, *D. illinoense* Gray, has been reported from Ky. by Greenwell (1935), Shacklett (1937) and others, but apparently just based on misidentifications (M).

HAB F-10,8 ::? C 5. **ABU** g10 s9 -1?

0968--*Desmodium sessilifolium* (Torr.) Torr. & Gray

Fabaceae <F-Desmodieae>: *Desmodium* <Pauciariculata> *sessilifolium*

This occurs in most eastern states, but it is concentrated in the central and lower Mississippi Valley, and rare to absent in most southeastern states. In Ky. and Tenn. it appears to be a conservative remnant of taller native grassland on or near the Pennyrhile Karst Plain and on uplands of the Mississippi Embayment. It is typical of somewhat cherty or sandy soils, not purely calcareous glades.

HAB 10 C? 5. **ABU** g9 s7 -4.

0969--Desmodium obtusum (Muhl. ex Willd.) DC.

Fabaceae <F-Desmodieae>: *Desmodium* <Pauciarticulata> *obtusum* (*rigidum*) This is widely scattered over southeastern states but rather poorly known in Ky., where it appears to be a conservative remnant of native grasslands on dry acid soils in several regions. There has been confusion with *ciliare*, *paniculatum* and other species.

HAB r-10,12 B 5. **ABU** g9 s7 -4.

0970--Desmodium ciliare (Muhl. ex Willd.) DC.

Fabaceae <F-Desmodieae>: *Desmodium* <Pauciarticulata> *ciliare* ("*obtusum*")

This is widespread across southeastern states. In Ky. it is known from remnants of native grassland in various regions, and it can spread into associated old fields and rights-of-way, but it is rare to absent on relatively moist and fertile soils than have been intensively farmed.

HAB f-10,12 C? 5. **ABU** g10 s8 -3.

0971--Desmodium marilandicum (L.) DC.

Fabaceae <F-Desmodieae>: *Desmodium* <Pauciarticulata> *marilandicum* This close relative of *ciliare* has a similar range in southeastern states, and there is much overlap of habitats. Ecological differences remain uncertain.

HAB f-10 C 5. **ABU** g9 s8 -3.

0972--Desmodium canadense (L.) DC.

Fabaceae <F-Desmodieae>: *Desmodium* <Longibracteata> *canadense* There are several reports of this northeastern species from Ky. (M), but only one coll. is known: ROWA (MDKY), E.P. Walters, 20 Aug 1938, edge of woods, Fraley's Hollow, Morehead.

HAB f-10? C? 5? **ABU** g10 s1? -5?

0973--Desmodium cuspidatum (Muhl. ex Willd.) DC. ex Loud.

Fabaceae <F-Desmodieae>: *Desmodium* <Longibracteata> *cuspidatum* (*bracteosum*)

This rather large-leaved *Desmodium* is widespread across east-central states, but generally uncommon and associated with remnants of open woodland or brushy grassland on relatively moist, fertile soils. It is easily overlooked and poorly collected. A relatively hairy coll. from BOON (KY) may be referable to var. *longifolium* (T. & G.) Schub., or perhaps hybridized with *D. canescens*. Var. *longifolium* is largely midwestern but with scattered records from some southeastern states (PL).

HAB r-10,8 D 4. **ABU** g9? s7 -4.

0974--Desmodium paniculatum (L.) DC.

Fabaceae <F-Desmodieae>: *Desmodium* <Stipitata> *paniculatum* (var. *p.*) This widespread eastern species is generally distinct from *perplexum* and *glabellum*, but there are occasional (<1%) intermediates (Isely 1983).

Included here are records of var. *pubens* Torr. & Gray.

HAB f-7,10,11 C 4. **ABU** g10 s10 -2.

0975--Desmodium glabellum (Michx.) DC.

Fabaceae <F-Desmodieae>: *Desmodium* <Stipitata> *glabellum* This widespread eastern species is close to *perplexum*, and ca. 1-10% of colls. appear somewhat intermediate (Isely 1983). *D. glabellum* has distinctive hooked hairs on its stems, petioles and the veins of upper leaf surfaces; *perplexum* usually lacks such hairs, and its stems have longer spreading hairs. Also, upper leaf surfaces of *glabellum* usually have a slightly silvery central band. It tends to occur in drier and less fertile soils. There has also been confusion in nomenclature with *D. humifusum* (Muhl. ex Bigelow) Beck, which is unknown in the state.

HAB F-10,7 C 5. **ABU** g9 s9 -1?

0976--Desmodium perplexum Schub.

Fabaceae <F-Desmodieae>: *Desmodium* <Stipitata> *perplexum* ("*dillenii*") This widespread eastern species is close to *glabellum*; see notes under that species. *D. perplexum* is the most common "tick-trefoil" of abandoned farmland and roadsides across Ky., but much browsed and reduced by livestock or deer in some localities.

HAB F-10,7 D 5. **ABU** g10 s10 +1?

0977--Desmodium viridiflorum (L.) DC.

Fabaceae <F-Desmodieae>: *Desmodium* <Stipitata> *viridiflorum*

This is widespread in open woodland and brushy grassland across southeastern states, but generally restricted to acid soils. In Ky. there appear to be occasional hybrids with *glabellum* or *perplexum*.

HAB r-10,8,7 B 4. **ABU** g9 s8 -2.

0978--*Desmodium nuttallii* (Schindl.) Schub.

Fabaceae <F-Desmodieae>: *Desmodium* <Stipitata> *nuttallii*

This southeastern species is locally common at least as far north as Mo., Tenn. and Va., but it is close to *viridiflorum* and some northern records are probably confused (F, Cr, W; Isely 1990). For Ky. there are only a few reported colls. from the eastern margins of the Mississippian Emayment (Woods 1983, Chester 1992); the coll. from CALL could not be found at MUR.

HAB r-10,12? B? 4. **ABU** g8? s4? -4.

0979--*Desmodium laevigatum* (Nutt.) DC.

Fabaceae <F-Desmodieae>: *Desmodium* <Stipitata> *laevigatum*

This is widespread across southeastern states, but largely restricted to thin woods and edges on dry acid soils. In Ky. there appear to be rare hybrids with *glabellum*, *paniculatum* or *marilandicum*; see colls. at KY, BERA and elsewhere.

HAB r-10,7 B 3. **ABU** g9 s9 -2.

0980--*Lespedeza bicolor* Turcz.

Fabaceae <F-Desmodieae>: *Lespedeza bicolor*

During recent decades, this small shrub has been widely planted across eastern states for "reclamation" and "wildlife" in old fields and mined areas. *L. bicolor* ($2n = 18, 22$) has been confused with *thunbergii*, which is reported to include tetraploids ($2n = 22, 40$) and extends into cooler zones within East Asia (Cr; Flora of China 2000). In Ky. both species were unknown as wild plants before 1980 (M). Some colls. mapped here may be from plantings.

ALI AS. **HAB** F-10,8 C 4. **ABU** +5.

0981--*Lespedeza thunbergii* (DC.) Nakai

Fabaceae <F-Desmodieae>: *Lespedeza thunbergii*

This is close to *bicolor*, with similar distribution in North America. In addition to its larger flowers in drooping racemes, leaflets tend to be more elongated; stems tend to be clustered and purplish (W).

ALI AS. **HAB** F-10,8 B? 4. **ABU** +4.

0982--*Lespedeza repens* (L.) W. Bart.

Fabaceae <F-Desmodieae>: *Lespedeza repens*

This is a widespread southeastern species of open areas on dry acid soils, especially where soil is exposed. In Ky. there appear to be occasional hybrids with *intermedia* and others.

HAB f-10,7,11 :: C 5. **ABU** g10 s9 -2.

0983--*Lespedeza procumbens* Michx.

Fabaceae <F-Desmodieae>: *Lespedeza procumbens*

This is close to *repens*, with similar southeastern range and habitats, but tends to occur in more shady areas, on average. In Ky. there appear to be occasional hybrids with *intermedia*, *virginica* and others.

HAB f-7,10,11 :: C 4. **ABU** g10 s10 -2.

0984--*Lespedeza violacea* (L.) Pers.

Fabaceae <F-Desmodieae>: *Lespedeza violacea* (*frutescens*)

This is widespread in eastern states, but largely restricted to thin, disturbed woodland on somewhat base-rich soils. Although F, Cr, J, Isely (1998) and others appeared to deal with earlier confusion in nomenclature, Reveal & Barrie (1991) showed that *L. frutescens* (L.) Hornem should be the correct name for this species, and that *violacea* should be applied to what has been called *intermedia*. This change is already adopted by K and W, but it breaks a long tradition and causes much confusion. If there really is a problem with the rules of nomenclature, the rules should be changed to conserve these names. This is the kind of thing that gives botanists a bad name!

HAB r-11,8? D 3. **ABU** g10 s9 -3?

0985--*Lespedeza intermedia* (S. Wats.) Britt. var. *intermedia*

Fabaceae <F-Desmodieae>: *Lespedeza intermedia* var. *i.* ("*frutescens*", ?*violacea*)

This is a widespread eastern species of dry open woodland and brushy grassland. In Ky. it appears to form occasional hybrids with *virginica*, *hirta*, *procumbens*, *repens* and perhaps others. See note on nomenclature under *violacea*.

HAB f-7,11,10 C 4. **ABU** g10 s9 -2.

0986--*Lespedeza intermedia* (S. Wats.) Britt. var. *hahnii* Blake

Fabaceae <F-Desmodieae>: *Lespedeza intermedia* var. *hahnii* (?*nuttallii*)

The status of this distinctly pubescent taxon needs further study. F treated it as a form. Isely (1998) indicated that it could have resulted from introgression of *hirta* into *intermedia*, and might include plants known as *X nuttallii* Darl.

Plants that appear to be simple F1 hybrids (including *X simulata* MacKenzie & Bush) are more like *hirta*; these are not mapped here but have been reported from LEWI, MCRE, PULA and elsewhere (B, M).

HAB f-7,11,10? B? 4. **ABU** g9? s8? -2.

0987--*Lespedeza virginica* (L.) Britt.

Fabaceae <F-Desmodieae>: *Lespedeza virginica*

This is a widespread eastern species of seasonally dry grasslands. In Ky. there are occasional hybrids with *procumbens*, *intermedia*, and probably other species.

HAB f-10,12,7 C 5. **ABU** g10 s9 -3?

0988--*Lespedeza stuevei* Nutt.

Fabaceae <F-Desmodieae>: *Lespedeza stuevei*

This is generally considered to be a distinct southeastern species, close to *intermedia* but with more pubescence (spreading or strigose) and a relatively congested (glomerate) inflorescence. However, some colls. referable to *stuevei* may resemble hybrids of *capitata* with *virginica* or with *intermedia*. Further analysis of potential intergradation among these taxa and others is needed; $2n = 20$ in all native *Lespedeza*s of Ky. (F, Cr, W). Hybrids of *stuevei* with *virginica* can be expected; see colls. from adjacent states at GH. In Ky. *stuevei* is known mostly from calcareous glades, often associated with *virginica*. It has sometimes been confused with hairy forms of *intermedia* or (lacking flowers) with *capitata*, which species tend to occur on more acid soils.

HAB 12,10 + D 5. **ABU** g9 s6? -3.

0989--*Lespedeza capitata* Michx.

Fabaceae <F-Desmodieae>: *Lespedeza capitata*

This is a widespread eastern species but uncommon to rare in Ky., where it is usually associated with remnants of native grassland on relative deep, medium-acid soils. Some of its largest populations are inside Fort Campbell, on cherty soils at the western side of the former Big Barrens. In vegetative condition, this species may be confused with *stuevei*. Also, hybrids with *hirta* are known in other states, but not yet in Ky.

HAB 10 C 5. **ABU** g10 s7 -5.

0990--*Lespedeza hirta* (L.) Hornem.

Fabaceae <F-Desmodieae>: *Lespedeza hirta*

This is widespread across most eastern states, but absent from the upper midwest. In Ky. it is widespread in hilly regions, but, like others in the genus, it has probably been much reduced by browsing of livestock (Gm). There appear to be occasional hybrids with *procumbens* and *intermedia*. Also, hybrids with *capitata* are known from some adjacent states (GH).

HAB f-7,11,10 B 4. **ABU** g10 s9 -2.

0991--*Lespedeza cuneata* (Dum.-Cours.) G. Don

Fabaceae <F-Desmodieae>: *Lespedeza cuneata*

This vigorous species has been widely used in eastern states for "reclamation" of mines, old fields and other severely disturbed sites, but it then presents a serious problem for restoration of native biological diversity. In Ky. it was first recorded in the 1930s (B). Some colls. may come from plantings, but the species is also frequently naturalized through seed dispersal.

ALI AS. **HAB** F-10,1 C 5. **ABU** +6*.

0992--*Kummerowia striata* (Thunb.) Schindl.

Fabaceae <F-Desmodieae>: *Kummerowia* [*Lespedeza*] *striata*

This annual has been widely sown for at least a century as "Japanese" clover or bush-clover, and it is widely naturalized in southeastern states. After early trials, Gm (1902) noted that the colder climate of n. Ky. appeared to limit the success of this species there, but it had already become "especially common" in some western counties (HICK, HOPK, LOGA).

ALI AS. **HAB** F-10,12 ::: C 6. **ABU** +6.

0993--*Kummerowia stipulacea* (Maxim.) Makino

Fabaceae <F-Desmodieae>: *Kummerowia* [*Lespedeza*] *stipulacea*

This species ($2n = 20, 22$) is closely related to *striata* ($2n = 22$). It has been widely sown as "Korean bush-clover" in eastern states for similar purposes, extending into somewhat cooler zones (PL). It has been established in Ky. since the 1930s or earlier (Shaklette 1937; B), but was not listed by Gm in 1902.

ALI AS. **HAB** F-10,12 ::: D? 6. **ABU** +6.

0994--*Vicia caroliniana* Walt.

Fabaceae <F-Fabeae>: *Vicia* <*Cracca*> *caroliniana*

This is a widespread southeastern perennial of thin woods and thickets on moderately dry, medium acid soils. *V. minutiflora* F.G. Dietr. is a related southern species expected in Ky. It occurs mostly in thin calcareous woods from Tex. and Mo. to Fla. and c. Tenn., including counties adjacent to Ky.

(Ch). It differs from *caroliniana* in its annual habit, smaller racemes and smaller pale blue to lavender (versus white to lavender-tinged) flowers (Isely 1990; J).

HAB r-7,11,10 ::? C 3. **ABU** g10 s10 -2.

0995--*Vicia cracca* L. R

Fabaceae <F-Fabeae>: *Vicia* <Cracca> *cracca*

This perennial is widely established across northern North America, but rare or absent in southeastern states. Although often considered alien, there may have been native plants in the northeast (Cr). It has been reported from a few western counties (CARL, GRAV, HICK, etc.) by Mohlenbrock et al. (1966) and perhaps others (CASE, FAYE); see Gray (1864), BA, Gm and M. However, colls. have not been located.

ALI EU?

0996--*Vicia americana* Muhl. R

Fabaceae <F-Fabeae>: *Vicia* <Cracca> *americana*

This widespread northern and western perennial was reported from Ky. by Gray (1864), Linney (1882), Britton & Brown (1897) and Gm, but no coll. has been located. It does occur at higher elevation in w. Va. (W).

0997--*Vicia dasycarpa* Ten.

Fabaceae <F-Fabeae>: *Vicia* <Cracca> *dasycarpa* (*villosa* ssp. *varia**)

There has been confusion with typical *villosa*, which is more hairy, but some taxonomic recognition is justified (Cr, W). *V. dasycarpa* is less successful in colder regions of North America (PL). It may not have been widespread in Ky, until the 1980s (M), but it now much more frequent than typical *villosa*. Some records mapped here probably come directly from fresh plantings, but populations can persist for many years through subsequent changes in management, especially along fencerows.

ALI EU. **HAB** F-10,8 ::? D 4. **ABU** +6.

0998--*Vicia villosa* Roth

Fabaceae <F-Fabeae>: *Vicia* <Cracca> *villosa* (ssp. *v.*)

This annual "winter vetch" has been widely promoted for forage across North America, and it was established in Ky. before 1900. Gm (1902) noted : "Its vigorous growth is a pleasure to see when other plants are suffering from unfavourable weather." See also *dasycarpa*, which has been combined with *villosa* by some authors.

ALI EU. **HAB** F-10,8 ::? D 4. **ABU** +6.

0999--*Vicia tetrasperma* (L.) Schreb.

Fabaceae <F-Fabeae>: *Vicia* <Ervum> *tetrasperma*

This annual is widely scattered across North America except in arid regions, but it is most common on the southeastern Coastal Plain (PL). In Ky. it has been recently collected from PULA (M. Medley for WKY) and MADI (BEREA; Abbott et al. (2001).

ALI EU. **HAB** F-10,8? ::? D? 4. **ABU** +4.

1000--*Vicia grandiflora* Scop.

Fabaceae <F-Fabeae>: *Vicia* *grandiflora*

This Mediterranean annual has been sown for forage, "wildlife" or other purposes in southeastern states. In Ky. it has been tried in various plantings, but it is much consumed by rabbits or other herbivores, and rarely persistent (T. Taylor, pers. comm.). A related species, *V. lathyroides* L., may also be expected in horticultural settings, and has been observed in CAMP (J. Thieret, pers. comm.).

ALI EU. **HAB** F-10 ::? D 4. **ABU** +4.

1001--*Vicia sativa* L.

Fabaceae <F-Fabeae>: *Vicia* *sativa* (ssp. *s.*)

This is close to *angustifolia*, but there should be some taxonomic recognition. It is much less extensive in North America, especially in more arid regions (PL).

ALI EU. **HAB** F-10,8 ::? C 4. **ABU** +4.

1002--*Vicia angustifolia* L.

Fabaceae <F-Fabeae>: *Vicia* *angustifolia* (*sativa** ssp. *nigra*)

This Mediterranean annual has been widely planted for forage across North America. It is close to typical *sativa*, and is often treated as *V. sativa* L. ssp. *nigra* (L.) Ehrh. Some records mapped here may come from plantings.

ALI EU. **HAB** F-10,8 ::? C 4. **ABU** +5.

1003--*Lathyrus ochroleucus* Hook.

Fabaceae <F-Fabeae>: *Lathyrus* *ochroleucus*

This is a widespread northern diploid (2n = 14) extends south in eastern states to Ohio, Ind. and Ill. There is an old fruiting coll. from DAVI (KY-Agr.): J.C. McClure, 7 Jun 1932, Owensboro. This coll. clearly has the distinctive semi-cordate stipules of *ochroleuca* (versus semi-sagittate in *venosus* and *palustris*).

HAB 7,11,10? ::? D? 3? **ABU** g10 s1? -6?

1004--Lathyrus venosus Muhl. ex Willd.

Fabaceae <F-Fabeae>: *Lathyrus venosus* (var. *intonsus*)

This tetraploid (2n = 28) has a broad northeastern range, but in Ky. it is known only from a few Appalachian sites in thin woods on ridges with dry, medium-acid soils. All material from Ky. matches the hairy var. *intonsus* Butters & St. John, but that taxon has not been recognized in recent treatments.

HAB 7,11 ::? C 3. **ABU** g10 s5 -2.

1005--Lathyrus palustris L.

Fabaceae <F-Fabeae>: *Lathyrus palustris*

This hexaploid (2n = 42) has a widespread, circumboreal range. In Ky. it is known only from rocky river-banks at a few widely spaced localities. All material matches the relatively smooth and slender-leaves var. *myrtifolius* (Muhl. ex Willd.) Gray, but that taxon is not recognized in recent treatments.

HAB 1,2? ::? C 4. **ABU** g10 s3 -1.

1006--Lathyrus latifolius L.

Fabaceae <F-Fabeae>: *Lathyrus latifolius*

This tall climbing perennial has been widely cultivated (as "everlasting pea") across North America, and it often persists or spreads. The related annual, *L. odoratus* L. ("sweet pea") is a more popular ornamental but it does not persist. Both originate from southern Europe.

ALI EU. **HAB** R-10,8 :: D 4. **ABU** +6.

1007--Lathyrus sylvestris L.

Fabaceae <F-Fabeae>: *Lathyrus sylvestris*

This "everlasting pea" is cultivated and locally established in more humid regions of North America (PL). It was tried for forage in the 1890s at the Univ. of Ky., but did not grow well or even produce flowers (Gm).

ALI EU. **HAB** R-10,8 :: D 4. **ABU** +5.

1008--Lathyrus hirsutus L.

Fabaceae <F-Fabeae>: *Lathyrus hirsutus*

This is scattered widely across southeastern states, but it is rare to absent in the Ohio Valley. It an annual or biennial; all other well-established *Lathyrus* spp. of Ky. are rhizomatous perennials.

ALI EU. **HAB** R-10,8 :: D? 4. **ABU** +5.

1009--Lathyrus tuberosus L. W

Fabaceae <F-Fabeae>: *Lathyrus tuberosus*

This perennial has been recently reported from Ky., but data need to be checked (Abbott et al. 2001). The species is typical of cool temperate climates and, in southeastern states it is probably just a rare waif (Cr, PL, W).

ALI EU.

1010--Lathyrus pratensis L. W

Fabaceae <F-Fabeae>: *Lathyrus pratensis*

This has been collected from WARR (MM #9964-84), but it is typical of cold humid climates and probably not persistent in Ky. or other southeastern states (PL, W). It is a cytologically variable species: 2n = 7-42, versus 14 for all other Eurasian *Lathyrus* in Ky.

ALI EU.

1011--Pisum sativum L. C

Fabaceae <F-Fabeae>: *Pisum sativum* (var. *s.*)

This annual is the common "garden pea" but it is not known to persist or naturalize. The more northern var. *arvense* (L.) Poiret was a failure in early trials at the Univ. of Ky. (Gm).

ALI EU.

1012--Stylosanthes biflora (L.) B.S.P.

Fabaceae <F-Aeschynomeneae>: *Stylosanthes biflora* (riparia)

Segregates within this widespread southeastern species were generally recognized during 1900-1950 (Sm, F), but rarely since then (from B to W). Colls. from CLIN (GH), MUHL (KY) and WAYN (GH) have been called *S. biflora* var. *hispidissima* (Michx.) Pollard & Ball, with the stem more pubescent.

Plants formerly referred to *S. riparia* Kearney may be concentrated in north-central counties, with colls. from CLAR, ESTI, GARR, HARD, MADI and MEAD. *S. riparia* has been considered to differ in its less ascending habit; its leaves smaller (ca. 0.5-2.3 cm long versus 1.5-4 cm) and oval to oblanceolate (versus lanceolate); and its bracteal leaves with smooth (versus usually bristly-hispid) bases and with eciliate (versus bristly-ciliate) blades. There are no clear differences in range or habitat, based on current data. *S. riparia* was initially described from along the French Broad Rv. in Tenn.

HAB f-10,7,12 ::? B 4. **ABU** g9 s9 -2.

1013--*Tephrosia virginiana* (L.) Pers.Fabaceae <F-Millettieae>: *Tephrosia virginiana*

This is widespread across eastern states, but largely restricted to thin woods and brushy grassland on xeric, infertile acid soils. Within Appalachian Ky., it is much commoner in southern sections that have more history of fire (Campbell et al. 1991).

HAB 12,10,11,1 B 4. **ABU** -3.**1014--*Tephrosia spicata* (Walt.) Torr. & Gray**Fabaceae <F-Millettieae>: *Tephrosia spicata*

This decumbent species occurs in southeastern states east of the Mississippi Rv., mostly in openings on sandy soils of the Coastal Plain. There are somewhat disjunct plants in varied southern Appalachian localities with histories of disturbance. In Ky. *spicata* is known only from banks of the Cumberland Rv. and its Big South Fk., plus a few sites on nearby uplands.

HAB 1,10 :: B 4. **ABU** g9 s2 -2.**1015--*Wisteria frutescens* (L.) Poir. T**Fabaceae <F-Millettieae>: *Wisteria frutescens* (var. f.)

The native range of this species, in its strict sense, may have been largely restricted to the Coastal Plain and Piedmont from Va. to La., in contrast to *macrostachya*, but some authors have not considered these two taxa distinct (Sm, F; Isely 1998; W). It is possible that some plants in southern Appalachian regions are intermediate, but no definitive study has been made. Reports of typical *frutescens* from Ky. (e.g. Duncan 1967) deserve further investigation, and may be based on the plants mapped here under *macrostachya* from more sandy alluvium along Appalachian rivers: in LAUR (BEREA), MCRE (KY), PULA (KY) and WHIT (MM). [There is similar biogeography within *Isotrema* and *Catalpa*.]

Typical *frutescens* has much smaller racemes, mostly 4-12 cm long (versus 15-30 cm); pedicels and calyx have few or no clavate glands (versus abundant). Leaflets tend to be smaller, less acuminate and darker glossy bluish green; hairs on stems, petioles and pedicels are generally denser, less spreading and whitish (versus slightly yellowish). In recent decades, several cultivars of both taxa have become widely grown and appear quite distinct: for example, *macrostachya* "Blue Moon" versus *frutescens* "Amethyst Falls" (Valder 1995). Flower color, fragrance, growth form and hardiness vary much among cultivars and wild types.

HAB 1 C? 4.**1016--*Wisteria macrostachya* (Torr. & Gray) Nutt. ex B.L. Robins. & Fern.**Fabaceae <F-Millettieae>: *Wisteria macrostachya* (*frutescens** var. m.)

This vine of the central and lower Mississippi watershed appears to be native along major rivers in western regions of Ky., at least the Ohio Rv.

downstream of Louisville, the Green Rv., Cumberland Rv., Tennessee Rv. and their major tributaries. *W. macrostachya* became cultivated in Ky. early after Virginian settlement (as "Kentucky Wisteria"), especially around Louisville and elsewhere in northern counties. Short (1840) listed it as *frutescens*: "A flowering pea-vine, now common in gardens and shrubberies; abundant on the banks of Little River in the West of Kentucky." Open dots on the map indicate possible adventive status, or in some cases represent unverified historical data of Gm. The exact original range remains uncertain.

HAB 1,2 D 4. **ABU** g10 s7 -2.**1017--*Wisteria sinensis* (Sims) DC.**Fabaceae <F-Millettieae>: *Wisteria* <Rehsonia> *sinensis*

This is widely planted and escaped across southeastern states. In Ky. it has escaped from some rural gardens in the south, but it has spread little in northern urban areas. It has often been confused with *floribunda* or *macrostachya*, especially without flowers. In contrast to the native wisterias, leaflets of both *sinensis* and *floribunda* tend to be thinner, undulate along margins (versus plane), and usually smoother (with appressed whitish hairs).

ALI AS. **HAB** f-10,8 C? 4. **ABU** +5.**1018--*Wisteria floribunda* (Willd.) DC.**Fabaceae <F-Millettieae>: *Wisteria* <Rehsonia> *floribunda*

This may be at least as widespread in Ky. as *sinensis* (Cr), but colls. should be checked in some cases. There is evidence of extensive hybridization between these two species in southeastern states (Trusty et al. 2008).

ALI AS. **HAB** f-10,8 C? 4. **ABU** +4.**1019--*Sesbania herbacea* (P. Mill.) McVaugh**Fabaceae <F-Sesbanieae>: *Sesbania herbacea* (*exaltata**, *macrocarpa*)

This is a tall annual weed that may be native to warmer regions of southeastern states, especially in the lower Mississippi Valley (K, SE, W). In Ky. it is known mostly from the floodplain of the Mississippi Rv. McFarland (1942) provided the first record.

ALI S. **HAB** H-9? ::? D? 5. **ABU** +4.

1020--Robinia pseudoacacia L.Fabaceae <F-Robineae>: *Robinia pseudoacacia*

This tree was originally concentrated in east-central states, especially Appalachian and Ozarkian regions. Its range has been expanded greatly due to plantings and escapes. Early records indicate that it was locally common within the Bluegrass region at the time of settlement (Campbell 1987), but uncommon to absent in western regions of the state (Barton 1919). See note on hybrids under *kelseyi*.

In the central Bluegrass, Short (1828-9) noted: "My own observations do not agree with those of M. Michaux in regard to habits of this tree; for although it does occur in profuse abundance in this and other richest lands of Kentucky; yet I have found the largest and most thrifty stocks on the Ohio river in Boon county, seventy miles north of Lexington, where the soil is greatly inferior to that in this vicinity."

HAB f-8,7,11,10 D 4. **ABU** g10 s10 +1.**1021--Robinia viscosa Vent. R**Fabaceae <F-Robineae>: *Robinia viscosa*

This is native to the Blue Ridge and nearby mountains, but has also been widely cultivated (W). It has been reported from Ky. by RAB and M, but it has not been verified; there has been confusion with *boynntonii*.

ALI E.**1022--Robinia fertilis Ashe**Fabaceae <F-Robineae>: *Robinia fertilis* (*hispida** var. f.)

This frequently planted diploid ($2n = 20$) is not native to Ky., and probably originates from the southern Blue Ridge in N.C. and Tenn. (Isely & Peabody 1984; W). It has been confused with the triploids ($2n = 30$), *hispida* and *boynntonii*, which are native to Ky. See note on hybrids under *kelseyi*. In Ky. *fertilis* often persists and escapes; the degree of naturalization is often unclear from coll. data.

ALI E. **HAB** r-8,10 C 4. **ABU** +5.**1023--Robinia hispida L.**Fabaceae <F-Robineae>: *Robinia hispida* (var. h.)

This has a southern Appalachian range but apparently centered to the north of *boynntonii*. Further investigation is needed to separate records from those of *boynntonii* and *fertilis*. In Ky. typical *hispida* is known only from low open

rocky slopes near the Breaks of the Sandy Rv. (Russell Fork) in PIKE (KY). It is also known nearby from Dickenson Co., Va. (B).

HAB 12,10? B 4. **ABU** g6 s2 -3.**1024--Robinia kelseyi Cowell ex Hutchinson R**Fabaceae <F-Robineae>: *Robinia kelseyi* (*hispida* var. k.)

Isely & Peabody (1984; Isely 1990) could find no wild plants of *kelseyi*. They suggested it may have horticultural origin from hybridization of *pseudoacacia* with *fertilis*; all three taxa are diploids ($2n = 20$). This hybrid may be represented by a coll. from PERR (EKY). Some reports from Ky. may have been based on misidentified *boynntonii* (Isely & Peabody 1984). A coll. of *kelseyi* from HARL was reported by B (Braun #450) but cannot be located. Also, Hinkle (1975) reported *kelseyi* from BELL (check TENN).

ALI E.**1025--Robinia boynntonii Ashe**Fabaceae <F-Robineae>: *Robinia boynntonii* (*hispida** var. *rosea*)

This southern Appalachian species has been confused with *hispida* and *fertilis*, which can reasonably be combined as varieties. *R. boynntonii* rarely flowers in the wild; fruits are virtually unknown anywhere in its range (Isely & Peabody 1984), except for a coll. of M. Medley (for WKY). A large living clone has been established at the Univ. of Ky. Arboretum, originating from the knob just east of Cumberland Falls State Park in WHIT. There is no question that this species is native to se. Ky., since it is known from 10-20 sites in the wild, mostly in open woods or edges on remote ridges, with no evidence of nearby cultivation.

HAB 12,10 B 4. **ABU** g6 s4 -3.**1026--Clitoria mariana L.**Fabaceae <F-Phaseoleae>: *Clitoria mariana*

This ranges widely from southeastern states to South America. It has the largest flowers of any legume in Ky. (Fabaceae sensu lato), with a provocative tendency to appear both early and late in the growing season (Isely 1998; W). Without flowers, *Clitoria* is easily confused with *Galactia*, but can usually be distinguished by its more developed stipules, ca. 2-4 mm long, striate-nerved and persistent (versus ca. 1 mm and withering); also, leaflets tend to be larger and less hairy to glabrous. These plants often grow together, but *Clitoria* tends to occur in less open areas on more acid soils, on average, and it can be more self-supporting (versus twining).

HAB r-10,7,11 B 3. **ABU** g9 s9 -3.

1027--*Centrosema virginianum* (L.) Benth.

Fabaceae <F-Phaseoleae>: *Centrosema virginianum*

This southeastern species of dry sandy soils extends north in the Mississippi watershed to Mo., Ill. and Ky., but it is rare in those states. The only record from Ky. is an old coll. from WAYN (US): L.B. Smith & A.R. Hodgdon #3878, 12-14 July 1937, brushy bank of Beaver Creek south of Monticello.

HAB F-10? ::? B? 5? **ABU** g9? s3 -3?

1028--*Phaseolus vulgaris* L. C

Fabaceae <F-Phaseoleae>: *Phaseolus vulgaris*

This common "green bean" is widely grown in gardens, with many cultivars, and self-seeded waifs occasionally appear near plantings. But, like *P. coccinea* L. ("scarlet runners") and several other types of cultivated bean, it is not truly naturalized. Native people in eastern states cultivated *vulgaris* in pre-Columbian times, as an introduction from the south.

ALI SA.

1029--*Phaseolus polystachios* (L.) B.S.P.

Fabaceae <F-Phaseoleae>: *Phaseolus polystachios*

This is widespread across southeastern and Atlantic Coastal states. It usually occurs in thin woods and thickets on moderately dry, medium acid soils.

Although suitable appears to be widespread, the species is generally uncommon in much of its range. In Ky. it is generally rare to absent in more farmed landscapes, presumably due to excessive disturbance in the past (including browsing by livestock).

HAB 8,10,7,11 C 4. **ABU** g9 s7 -3.

1030--*Vigna unguiculata* (L.) Walp. C

Fabaceae <F-Phaseoleae>: *Vigna unguiculata* (*sinensis*)

This annual has been widely cultivated (as "black-eyed pea" or "cow-pea") since about 1900, at least in warmer regions. However, it rarely persists and does not become naturalized. Other related species in this genus, and the peanut (*Arachis hypogaea* L.), follow the same pattern.

ALI AF.

1031--*Apios americana* Medik.

Fabaceae <F-Phaseoleae>: *Apios americana*

This is widespread on damp soils across eastern North America. In Ky. it is generally rare to absent in largely agricultural landscapes on relatively fertile

soils, which might be attributed to past disturbances rather than direct influence of the soil. It may have been used extensively for food by native people, but there is no clear evidence of cultivation; see C. W. Cowan in Ford (1985).

HAB 9,6,2,1 C 4. **ABU** g10 s9 -3.

1032--*Apios priceana* B.L. Robins.

Fabaceae <F-Phaseoleae>: *Apios priceana*

This globally threatened species occurs in s. Ill., w. Ky., c. Tenn., n. Miss. and n. Ala., mostly in thin woods and edges on base-rich soils at the base of rocky slopes (Woods 2005). It has disappeared from much of the northern part of its range, except for a few sites in or near the Land-Between-the-Lakes of Ky.

(LYON, TRIG) and Tenn. (Stewart & Montgomery Cos.). It needs to be cultivated for recovery, and for its large edible tubers of possible ethnobotanical interest.

HAB 8,7,5 D 4. **ABU** g4 s2 -5.

1033--*Rhynchosia tomentosa* (L.) Hook. & Arn.

Fabaceae <F-Phaseoleae>: *Rhynchosia tomentosa* (*erecta*)

This occurs in southeastern states mostly east of the Mississippi Rv., and it is largely restricted to dry acid soils. In Ky. most records are from relatively level uplands of the southern Cliff section, in rights-of-way with remnants of open grassy vegetation that was formerly maintained by fire (Campbell et al. 1991).

HAB 10,1 ::? B 5. **ABU** g10 s2 -4.

1034--*Rhynchosia latifolia* Nutt. ex Torr. & Gray R

Fabaceae <F-Phaseoleae>: *Rhynchosia latifolia*

This was reported from Ky. without details by Duncan & Foote (1975). There are also reports of *R. volubilis* Wood from Ky. (Pr, Isely 1990), but that species was probably confused with *latifolia* (M). No colls. of either species have been located. Both have southeastern ranges, mostly on the Coastal Plain, but *latifolia* extends further north, into se. Mo. (Y) and (rarely) w. Tenn. (Ch).

1035--*Glycine max* (L.) Merr. C

Fabaceae <F-Phaseoleae>: *Glycine max*

This common crop (soybean) leaves occasional self-seeded waifs or relics in old fields, but it is not known to naturalize.

ALI AS.

1036--*Amphicarpaea bracteata* (L.) Fern. var. *bracteata*

Fabaceae <F-Phaseoleae>: *Amphicarpaea bracteata* var. b.

This is a widespread eastern species, with perhaps two widespread varieties.

See notes under var. *comosa*, which is separated here on a provisional basis.

HAB 7,5,4,6 :: D 4. **ABU** g10 s10 -3.

1037--*Amphicarpaea bracteata* (L.) Fern. var. *comosa* (L.) Fern.

Fabaceae <F-Phaseoleae>: *Amphicarpaea bracteata* var. *comosa* (A. *pitcheri*)

Mapping here is provisional. Var. *comosa* was initially described as A.

pitcheri Torr. & Gray, and its status remains uncertain. It is generally

associated with more damp or fertile soils, and tends to flower a few weeks

earlier than typical *bracteata*. Previous authors (D, F) noted its generally more

hairy surfaces, larger leaves, larger flowers with deeper purple color (versus

lilac to white), and larger seeds. However, recent research (Parker 1996,

Callahan 1997; see also W) has indicated that the most useful diagnostic

differences may be in its fully grown leaves: longer petioles (6-6.8 cm versus

3.5-5.3 cm), longer petiolules of terminal leaflets (1.7-1.9 mm versus 1-1.4

mm), and longer terminal leaflets (5.5-6.1 cm versus 4.2-5.2 cm).

HAB 4,6,7? :: E? 4. **ABU** g9 s9 -3.

1038--*Galactia volubilis* (L.) Britt.

Fabaceae <F-Phaseoleae>: *Galactia volubilis*

This is a widespread southeastern species of dry grasslands on medium acid soils.

The traditional usage of *volubilis* and *regularis* is followed here, but based on type specimens Duncan (1979), W and others have indicated that these names should be switched. It is not clear if a proposal to conserve names will be made. Included here are several records of the more hairy var. *mississippiensis* Vail, which is not recognized in recent treatments. The closely related species generally known as *G. regularis* (L.) B.S.P. occurs mostly on the southeastern Coastal Plain; reports from Ky. are erroneous or unreliable (M), and it is not even known from Tenn. (Ch+).

HAB r-12,10 C 4. **ABU** g9 s8 -3.

1039--*Dioclea multiflora* (Torr. & Gray) C. Mohr

Fabaceae <F-Phaseoleae>: *Dioclea* [*Galactia*] *multiflora* (*G. mohlenbrockii*)

This semi-woody vine is known mostly from riparian woods and thickets of

the lower Mississippi Valley and Gulf Coastal Plain. Around the northern

Mississippian Embayment, this species is rare in Ky., endangered in Ill. and

unknown in Mo. (NS, PL). The monotypic *Lackeya* has been established for this species, but not yet adopted in North American floras (Fortunato et al. 1996).

HAB 6,4,9? D 4? **ABU** g8 s5 -4.

1040--*Pueraria montana* (Lour.) Merr.

Fabaceae <F-Phaseoleae>: *Pueraria montana* (var. *lobata**)

This unusually vigorous semi-woody vine has been promoted across southeastern states for forage and erosion-control, especially on abandoned farmland during the 1930s. It has become an invasive problem in some areas, but it rarely produces seed and does not generally spread into woods or native grasslands. In Ky. it is most common to the south, and its northern boundary lies close to the Ohio Rv. *P. montana* is a widespread, variable species in East Asia. North American plants may all be referred to var. *lobata* (Ohwi) Maesen & Almeida, which has been distinguished by its lobed leaves and perhaps other characters, but further revision is probably needed (Ward 1997).

ALI AS. **HAB** f-8,7,10 C 4. **ABU** +6.

1041--*Strophostyles umbellata* (Muhl. ex Willd.) Britt.

Fabaceae <F-Phaseoleae>: *Strophostyles umbellata*

This widespread southeastern species is a twining perennial that typically grows into bare ground of dry open woods and shorelines, especially on sandy soils.

HAB r-10,12,1 ::: C 6. **ABU** g9 s9 -1?

1042--*Strophostyles helvola* (L.) Ell.

Fabaceae <F-Phaseoleae>: *Strophostyles helvola*

This widespread eastern species is a twining annual that spreads into bare ground along shores, railroads and similar sites, especially on sandy or gravelly soils. Some plants are referable to var. *missouriensis* (S. Wats.) Britt., but that taxon has not been recognized in recent treatments. From initial analysis of DNA, *helvola* appears to be relatively uniform across its range (Riley-Hulting et al. 2004).

HAB r-1,10 ::: C 6. **ABU** g10 s9 +1?

1043--*Strophostyles leiosperma* (Torr. & Gray) Piper

Fabaceae <F-Phaseoleae>: *Strophostyles leiosperma*

This native range of this midwestern annual extends locally into Ind., Ky., Tenn. and Miss., but it is rare or adventive further east (PL).

HAB r-10,1? ::: C 6. **ABU** g9 s6 -3?

1044--*Polygala paucifolia* Willd.

Polygalaceae: *Polygala* <*Chamaebuxus*> *paucifolia*

This is a rhizomatous plant of cool mesic woods in northeastern regions, and it extends south along the Appalachians, mostly at moderate to high elevations (W). It was reported from Ky. by McFarland (1942), without details. The only known site is in LAUR (BEREA), discovered by R. Mears during 1992 (Campbell et al. 1994). *P. pauciflora* is also expected in ravines along the Big South Fork, since it is locally common along the Clear Fork in Morgan Co., Tenn. (J. Kiser, pers. comm.).

HAB 5,7 A 1. **ABU** g9 s2 -1?

1045--*Polygala lonchophylla* Greene ?

Polygalaceae: *Polygala* cf. *lonchophylla* (*senega* var. l.)

This taxon is the broad-leaved segregate of *senega* that occurs in relatively mesic woods of east-central states. It has been previously known as *P. senega* var. *latifolia* Torr. & Gray, but species status has been suggested by Trauth-Nare & Naczi (1998), and is favored for this Atlas. Trauth-Nare has labelled these plants as *P. lonchophylla* Greene, but more work is needed to ensure proper typification.

HAB 7,5,11 D 2. **ABU** g9 s9 -2.

1046--*Polygala senega* L.

Polygalaceae: *Polygala senega* (var. s.)

This cespitose perennial occurs in grassy openings on dry base-rich soils across northeastern regions, and extends south along the higher Appalachians (W). It should not to be confused with var. *latifolia*; see *P. cf. lonchophylla*. The only clearly verified record for Ky. may be from LEWI (KY), but further review is desirable (Trauth-Nare & Naczi 1998; R. Naczi, pers. comm.).

HAB 12,11 D 4? **ABU** g9? s3? -4?

1047--*Polygala polygama* Walt.

Polygalaceae: *Polygala polygama* (var. p.)

This biennial species, as the typical southeastern var. *polygama*, is known from several sites in MCRE (KY). Also, Rafinesque (1819) reported the species from "barrens" in Ky. but no colls. are known. The northeastern var. *obtusata* Chodat might also be expected in the state.

HAB r-10,7 :: B 4. **ABU** g10 s3 -4.

1048--*Polygala sanguinea* L.

Polygalaceae: *Polygala sanguinea*

This annual occurs on damp acid soils across eastern North America, except for the southeastern Coastal Plain. A few colls. from Ky. have greenish or whitish flowers (MCRA, METC). The record from FAYE is based just on a waif in a mowed lawn (JC, pers. obs.).

HAB f-9,6,10 :: B 4. **ABU** g10 s10 -2?

1049--*Polygala mariana* P. Mill.

Polygalaceae: *Polygala mariana*

This southeastern annual occurs mostly on sandy soils of the Coastal Plain, but with significant disjunctions in Tenn. as well as Ky. There has been some confusion with *P. curstissii* in Ky., but the records mapped here from DAVI and TODD are based on correctly identified colls. (KY).

HAB 9? ::? A? 5. **ABU** g8 s2? -4?

1050--*Polygala nuttallii* Torr. & Gray

Polygalaceae: *Polygala nuttallii*

This southeastern annual occurs mostly on sandy soils on lowlands and uplands from Mass. to Ga., but with scattered disjunct occurrences reported west to Ark. (W). For Ky. the only record is a coll. of B in 1941 from "moist flats in barren...west of Knob Lick" in METC (US); this should be rechecked. Reports from BATH, BELL and ROWA have been based on misidentified *curtissii* or *mariana* (M).

HAB 9,2? ::? A? 5. **ABU** g8? s1? -6?

1051--*Polygala curtissii* Gray

Polygalaceae: *Polygala curtissii*

This annual occurs on dry acid soils mostly in or near Appalachian regions, but with some extensions onto the Interior Low Plateaus of Tenn. and the Atlantic Coastal Plain. (PL, W). Although sometimes confused with *sanguinea* or other species, these are distinct taxa with no known hybrids.

HAB 12,11,10 \ A 4. **ABU** g8 s8 -1.

1052--*Polygala cruciata* L.

Polygalaceae: *Polygala cruciata* (var. c.)

Typical *cruciata* is an annual of damp acid soils, mostly on the southeastern Coastal Plain, but extending north to Tenn. and Ky. on the Cumberland Plateau and a few sites on the adjacent Interior Low Plateaus. Pr (see 1893 addendum) provided a disjunct coll. (MO) from Chalybeate Springs in EDMO, but virtually no trace of associated vegetation now remains. Var.

aquilonia Fern. & Schub. is more northern, with broader leaves and more compact racemes. It may intergrade with typical cruciata in Appalachian regions, and research is needed to clarify the distinction (F, Ch, W).

HAB 9 ::? A 5. **ABU** g10 s2 -5.

1053--Polygala ambigua Nutt.

Polygalaceae: *Polygala ambigua* (verticillata var. a.)

This annual occurs widely in open areas across east-central states, usually on seasonally dry, infertile soils with bare areas.

HAB f-10,12 ::: B 6. **ABU** g10 s9 =?

1054--Polygala verticillata L. var. isocycla Fern.

Polygalaceae: *Polygala verticillata* var. *isocycla*

This taxon is reportedly widespread across eastern states, but distinction from the typical variety needs to be checked; there may not be significant taxonomic differences.

HAB f-10,11,7 ::: B 4. **ABU** g10 s9? -1?

1055--Polygala verticillata L. var. verticillata

Polygalaceae: *Polygala verticillata* var. *v.*

This annual is reported to be centered in more northern regions than var. *isocycla*. *P. verticillata*, as generally defined, is a variable species that needs further analysis (W). It occurs in a variety of open habitats, especially on bare ground, but often in open woods as well as full sun.

HAB f-10,11,7 ::: B 4. **ABU** g9? s8? -1?

1056--Polygala incarnata L.

Polygalaceae: *Polygala incarnata*

This annual is widely scattered on acid soils in eastern states. But it is rare in Ky., where largely restricted to localities where open grassy conditions occurred before settlement, probably maintained with fire (e.g. Campbell et al. 1991).

HAB r-10 ::? B 5. **ABU** g10 s7 -4.

1057--Pyrularia pubera Michx.

Santalaceae: *Pyrularia pubera*

This shrub is restricted to the central and southern Appalachians. It is a semi-parasite on the roots of a wide range of woody species (Leopold & Muller 1983).

HAB 5 A 2. **ABU** g8 s8 -1.

1058--Nestronia umbellula Raf.

Santalaceae: *Nestronia umbellula*

This is largely restricted to the upper Coastal Plain and Piedmont from Ala. and Ga. to Va., with a few disjunct populations near western edges of the Cumberland Plateau in Ala., Tenn. and Ky. The only known Ky. site was discovered in WAYN (EKY) by G. Libby & T. Bloom in 1995 (Libby & Bloom 1998): above Beaver Creek upslope from outcrop at S end of spine of Cooper Point (Parnell Quad.)

HAB 5,11 C? 3? **ABU** g7 s2 -1?

1059--Comandra umbellata (L.) Nutt.

Santalaceae: *Comandra umbellata* (*richardsiana*)

Typical *umbellata* occurs widely in eastern states, except on the Coastal Plain. Most colls. in Ky. match *C. richardsiana* Fern., which is now generally combined; colls. from CART (KY) and MCRE (B) match typical *umbellata*. F's treatment deserves further evaluation; he indicated that *richardsiana* has a corymbose inflorescence (versus paniculate), with strongly ascending branches, and is perhaps typical of more calcareous soils in its largely midwestern range (versus largely Appalachian).

HAB 11,7,10,12 ::? C 3? **ABU** g10? s9? -2.

1060--Phoradendron serotinum (Raf.) M.C. Johnston

Viscaceae [Santalaceae]: *Phoradendron serotinum* (*leucarpum*, *flavescens*)

Typical *serotinum* occurs widely in southeastern states. As Gm noted: "Exceptionally severe winters sometimes destroy much of it, but it gradually reappears and becomes common again." The last extensive die-back in northern Ky. occurred after the winters of 1976-78.

R. Thompson (BEREA) has devotedly collected this inspiring hemiparasite from all counties except GRAN, where he has seen it on a cut-down tree. He has documented the host species in detail for several areas (e.g. Thompson & Noe 2003); see also Reed & Reed (1951). The most common host on base-rich soils is *Juglans nigra*, but it is also locally frequent on *Prunus serotina*, *Ulmus americana*, *Robinia pseudoacacia*, *Gleditsia triacanthos* and other species. On more acid soils, *Nyssa sylvatica* is usually the most common host.

HAB 7,10,11 ^^ D 3. **ABU** g10 s10 -2.

1061--Eriogonum longifolium Nutt. var. harperi (Goodman) Reveal

Polygonaceae <Eriogoneae>: *Eriogonum longifolium* var. *harperi*

Var. *harperi* is a distinct segregate of this southern species that is known only from outcrops and rocky woods of various types in disjunct localities of nw. Ala. and c. Tenn. MM collected this in CHRI (for WKY), but the coll. may be mislaid, and plants cannot be relocated at that locality.

HAB r-10,12 ::+ D? 5? **ABU** g4 s1 -6?

1062--*Rumex altissimus* Wood

Polygonaceae <Rumiceae>: *Rumex* <Axillares> *altissimus*

This is a widespread diploid ($2n = 20$) of streambanks in eastern and central North America. See note under *triangulivalvis*.

HAB 1,2 E? 5. **ABU** g10 s9 -3.

1063--*Rumex triangulivalvis* (Danser) Rech. f.

Polygonaceae <Rumiceae>: *Rumex* <Axillares> *triangulivalvis* ("mexicanus"; *salicifolius** var. t.)

This diploid ($2n = 20$) has a wide northern and western range, and occurs in varied open damp habitats, sometimes becoming weedy. *R. mexicanus* is a closely related tetraploid ($2n = 40$) with a southwestern range. There may also be some confusion or intergradation with *altissimus*. Further verification is desirable in Ky. (FNA 5).

R. triangulivalvis differs from *altissimus* in its narrower leaves (ca. 1-4 cm versus 3-5.5 cm), widest near middle (versus below middle); its smaller inner tepals (mostly 2.5-3.5 x 2.5-3 mm versus 4.5-6 x 3-4.5 mm); and its smaller achenes (ca. 1.7-2.2 mm long versus 2.5-3.5 mm).

HAB 1,2? E? 5. **ABU** g10 s4? -4?

1064--*Rumex verticillatus* L.

Polygonaceae <Rumiceae>: *Rumex* <Axillares> *verticillatus*

This hexaploid ($2n = 60$) is widely scattered in marshes of eastern North America.

HAB 2,3,9 D 5. **ABU** g10 s9 -3.

1065--*Rumex conglomeratus* Murr.

Polygonaceae <Rumiceae>: *Rumex* <Rumex> *conglomeratus*

This alien is widely scattered in southeastern states. It is closely related to the native species, *britannica*; both are diploids ($2n = 20$; see FNA 5 for details).

Both can also be confused, superficially, with *obtusifolius*;

ALI EU. **HAB** F-9,6? C? 5? **ABU** +4.

1066--*Rumex britannica* L. R

Polygonaceae <Rumiceae>: *Rumex* <Rumex> *britannica* (*orbiculatus*)

This widespread northern (circumboreal) species has been reported from Ky. by BA and others, but not verified. It is widespread on glaciated land in Ohio, Ind. and Ill., but may be unlikely in Ky. (K). See note under *conglomeratus*.

1067--*Rumex crispus* L.

Polygonaceae <Rumiceae>: *Rumex* <Rumex> *crispus*

This alien weed is widespread in North America. See note under *patientia*.

ALI EU. **HAB** F-10,9 :: D 6. **ABU** +6.

1068--*Rumex patientia* L.

Polygonaceae <Rumiceae>: *Rumex* <Rumex> *patientia*

This alien is fairly widespread in temperate regions of North America, but generally rare in southeastern states (K, W). The only record from Ky. is a coll. of J. Thieret along railroad tracks in CARR (KNK). *R. patientia* is close to *crispus*, and hybrids are known elsewhere; $2n = 60$ in both (Cr, FNA 5). There may also be confusion with *obtusifolius*.

ALI EU. **HAB** F-10? ::? D? 6? **ABU** +4.

1069--*Rumex pulcher* L.

Polygonaceae <Rumiceae>: *Rumex* <Rumex> *pulcher*

Within North America, this alien occurs mostly in southern states. There is a coll. from FAYE (KY-Agr.), but other reports are not verified (M). *R. pulcher* has been confused with *altissimus* and other native species, but it is an alien closely related to *obtusifolius* (FNA 5). *R. pulcher* is generally less robust than *obtusifolius*, with more spreading inflorescence branches, and tubercles are usually verrucose (versus smooth); $2n = 20$ (versus 40).

ALI EU. **HAB** F-10,9? D? 5. **ABU** +4.

1070--*Rumex obtusifolius* L.

Polygonaceae <Rumiceae>: *Rumex* <Rumex> *obtusifolius*

This robust alien weed is widespread in temperate regions of North America. See note under *pulcher*.

ALI EU. **HAB** F-9,10 :: D 6. **ABU** +6.

1071--*Rumex acetosa* L. R

Polygonaceae <Rumiceae>: *Rumex* <Acetosa> *acetosa*

This European plant is sometimes cultivated for food but it does not persist in the wild. Rafinesque (1836) listed *Rumex integrifolia* Raf., which might be

interpreted as *acetosa* (M). But it is likely that the related native species, *R. hastatus* Baldwin, does occur in Ky. That species is widely scattered across southeastern states, usually in disturbed areas on sandy soils (FNA 5; W).

ALI EU.

1072--*Rumex acetosella* L.

Polygonaceae <Rumiceae>: *Rumex* <Acetosella> *acetosella*

This widespread dioecious perennial alien weed, with creeping roots, was first reported a century ago. In 1914 Gm noted: "has of late overrun the cultivated land of Kentucky. It has been introduced in large quantities with clover and other seeds [including bluegrass], and it is being scattered still further with several of our small-seeded forage plants." However, it is not now a serious agricultural or horticultural weed. See FNA 5 for notes on variation; North American plants are generally referable to ssp. *pyrenaicus* (Pourret ex Lapeyrouse) Akeroyd.

ALI EU. **HAB** F-12,10 ::+ C 6. **ABU** +5.

1073--*Reynoutria japonica* Houtt.

Polygonaceae <Polygoneae>: *Reynoutria* [*Polygonum**] *japonica* (Po. *cuspidatum*)

This tall rhizomatous herb has become a widespread weed across temperate North America. In Ky. it is especially common along some Appalachian streams and rivers. Sight records of SE are mapped here as open dots.

R. japonica and the intergrading *sachalinensis* comprise a polyploid complex ($2n = 44$ to 132). The generic assignment of those two species remains controversial; *Reynoutria* may best be merged with *Fallopia* (as reviewed by W).

ALI AS. **HAB** 4,6 C 4. **ABU** +6*.

1074--*Reynoutria sachalinensis* (F. Schmidt ex Maxim.) Nakai

Polygonaceae <Polygoneae>: *Reynoutria* [*Polygonum**] *sachalinensis*

This giant rhizomatous herb from the Sachalin Islands has spread from northeastern states down the Ohio Valley into ne. Ky. within recent decades. It deserves further attention as a potentially invasive species. The hybrid with *japonica* (*X bohemica* J. Chrtek & A. Chrtkova) has also been reported from Ky., and is often confused with these species (FNA 5). In addition to gross morphological intermediacy, the hybrid differs from *japonica* in having leaf blades "obscurely puberulent along some veins abaxially, tips of hairs acute" (versus obscurely scabrous, with blunt tips).

ALI AS. **HAB** 4 D? 4? **ABU** +4.

1075--*Fallopia baldschuanica* (Regel) Holub C

Polygonaceae <Polygoneae>: *Fallopia* [*Polygonum**] *baldschuanica* (*aubertii*)

This woody vine is cultivated, under various names, and may occasionally escape. There is a coll. from CALD (KY-Agr.) that needs rechecking for identify and provenance. *F. aubertii* (Henry) Holub may just be a form of *baldschuanica* (FNA 5, W).

ALI AS.

1076--*Fallopia scandens* (L.) Holub var. *scandens*

Polygonaceae <Polygoneae>: *Fallopia* [*Polygonum**] *scandens* var. *s.*

This diploid ($2n = 20$) is widespread in eastern and central North America, especially in riparian zones but also weedy on some uplands with damp fertile soils.

HAB 4,6 :: D 4. **ABU** g10 s9 -2.

1077--*Fallopia scandens* (L.) Holub var. *cristata* (Engelm. & Gray) new comb.

Polygonaceae <Polygoneae>: *Fallopia* [*Polygonum**] *scandens* var. *cristata* ("dumetorum")

These plants should probably be treated as a small-seeded variety of *scandens* that tends to occur in drier habitats (F, FNA 5, W). Horton (1972) showed that the variation may be continuous, but further study is needed in the field, garden and herbarium. It is notable that these plants often occur in acid suberic woods with chestnut oak, while typical *scandens* occurs in fertile lowland woods.

F. dumetorum (L.) Holub, in its strict sense, is an alien from Europe that has often been confused with var. *cristata* and reported from Ky. (B, M, FNA 5), but no verified colls. have been seen. See also notes under *convolvulus*.

HAB 7? :: D 4. **ABU** g10 s10 -2.

1078--*Fallopia convolvulus* (L.) A. Löve

Polygonaceae <Polygoneae>: *Fallopia* [*Polygonum**] *convolvulus*

This tetraploid ($2n = 40$) is a widely scattered Eurasian annual weed, especially in or near urban areas, but it is not nearly as common in Ky. as the native perennial, *scandens*. There has been much confusion with *scandens*, especially var. *cristata*. Plants known as *convolvulus* var. *subulatum* Lej. &

Courts resemble *scandens* var. *cristatum* in their relatively large winged calices (F).

In addition to its annual habit, *convolvulus* differs from *scandens* (F, FNA 5) in its granular-puberulent calices (versus mostly smooth); its minutely roughened achenes (versus all lustrous); its smaller flowers (up to 3.5-5 (8) mm in fruit versus 4-10 mm), on relatively short pedicels; the usually undeveloped keels on its calices (occasionally up to 0.4-1 mm versus usually 0.5-3 mm); and the more acute sagittate lobes of its typically narrower leaves. **ALI** EU. **HAB** f-10,7,12? :: C 4. **ABU** +5.

1079--*Fallopia cilinodis* (Michx.) Holub

Polygonaceae <Polygoneae>: *Fallopia* [*Polygonum**] *cilinodis*
This northeastern diploid ($2n = 22$) was collected in Ky. by Abbott et al. (2001) on Manchester Island, in the Ohio River (LEWI at BERA). There have been other reports, but without details (Horton 1972; FNA 5). *F. cilinodis* may be confused with the weedy alien, *convolvulus*, and further discoveries are expected. However, its occurrences in the southern Appalachians are only at high elevation (W). **HAB** 4? D? 4. **ABU** g9? s2? -4?

1080--*Polygonum aviculare* L.

Polygonaceae <Polygoneae>: *Polygonum aviculare* (*monspeliensis*; *aviculare* var. *vegetum*, ssp. a.)
This widespread annual weed from Eurasia has several segregates or close allies that need more assessment in Ky. ($2n = 40, 60$). Although treated recently as subspecies for FNA 5, some of these taxa have often been considered species, and there is little or no intergradation in many areas. Those reported from Ky. are *P. arenastrum* (= *aviculare* ssp. *depressum* (Meisner) Arcangeli); *P. bellardii* (= *aviculare* ssp. *neglectum* (Besser) Arcangeli); and *P. buxiforme* (= *aviculare* ssp. b. (Small) Costea & Tardif); see notes under those names. **ALI** EU. **HAB** R-10,12 :: D 6. **ABU** +6.

1081--*Polygonum arenastrum* Boreau

Polygonaceae <Polygoneae>: *Polygonum arenastrum* (*aviculare* ssp. *depressum*; "aviculare")
This alien is reportedly widespread in North America, usually grows in pavement crevices and similar places (FNA 5, PL). There has only been a provisional review of colls. in the *aviculare* complex from Ky., but *arenastrum*

undoubtedly occurs throughout the state. Colls. mapped as uncertain records have relatively narrow leaves, suggesting *bellardii*, but may just be forms of *arenastrum*.

Compared to typical *aviculare*, seeds of *arenastrum* are usually 1.5-2.7 mm long (versus 2.7-3.7 mm); flower length is usually 2-3.4 mm (versus 2.8-4.7 mm), with ca. 40-60% as the tube (versus 20-40%); leaves are relatively uniform in size (with early leaves only ca. 0.5-2 cm long versus up to 2.5-6 cm in *aviculare*) and bluish-green (versus plain green). It is usually prostrate, remaining <1 cm above the ground (versus ca. 1-20 cm tall). **ALI** EU. **HAB** S-12,10 ::: D 6. **ABU** +6.

1082--*Polygonum bellardii* Allioni R

Polygonaceae <Polygoneae>: *Polygonum bellardii* (*aviculare* ssp. *neglectum*)
In North America, this segregate of the *aviculare* complex is known mostly from cool temperate to boreal regions (PL). It has been reported from Ky. (FNA 5). but colls. have not yet been sufficiently reviewed to map here. Closely related plants known as *P. aviculare* ssp. *rurivagum* (Jord. ex Boreau) Berher may also be expected (FNA 5). *P. bellardii* is generally intermediate in overall habit and dimensions between typical *aviculare* and *arenastrum*, but has distinctive linear-tending leaves (l/w ca. 4-10+ versus 2-5).

P. bellardii differs from *arenastrum* in its tepals: with unbranched veins (versus branched), margins white (versus usually pink or red), and overall green to reddish-brown color (versus just green). It differs from typical *aviculare* in its much narrower leaves (ca. 1-7 mm wide versus 6-15 mm); also, its cymes are smaller (usually with 1-3 flowers versus 3-8) and uniformly distributed (versus aggregated at tips); seeds are relatively short (1.2-1.8 mm) and distinctively exerted. **ALI** EU.

1083--*Polygonum buxiforme* Small

Polygonaceae <Polygoneae>: *Polygonum buxiforme* (*aviculare* ssp. b., var. *littorale*)
This hexaploid ($2n = 60$) is close to the Eurasian *aviculare*, possibly with some intergradation (FNA 5). It is reportedly native in much of mid-temperate to boreal North America (PL), on disturbed sites of various types, including shorelines of rivers or ponds, and nearby roadsides. The type is from close to the Ky. border in Lee Co., Va., "about Cumberland Gap... altitude 1500 feet" (J.K. Small, 27 Jul 1892, at NY).

P. buxiforme differs from other taxa of the aviculare complex in its ocreae, which have relatively persistent silvery distal parts (versus soon disintegrating into fibers). Also, its flowers are less elongated ($l/w = 0.9-1.5$ versus $1.5-2.9$) and the outer tepals are pouched at base (versus not pouched). Plants are usually prostrate, homophyllous, and grayish- or bluish-green. *P. buxiforme* was reportedly collected by B from "banks of Dry Run" in KENT (recheck US). Other records are tentatively mapped here, pending deeper review of the aviculare complex.

HAB 1? ::: E? 6. **ABU** g10? s1? -4?

1084--*Polygonum erectum* L.

Polygonaceae <Polygoneae>: *Polygonum erectum* (ssp. e.)

This widespread species of eastern and central North America was frequently used for its edible seed by native people during the Woodland era, along with other starchy seeds (*Chenopodium buschianum*, *Hordeum pusillum*, *Phalaris caroliniana*) and the oily *Iva annua* (Ford 1985, Wymer & Abrams 2003). However, there is little evidence of selection for seed size. *P. achoreum* S.F. Blake (*erectum* ssp. a.) is a closely related species of cool temperate to boreal regions, which may be expected in Ky.; $2n = 40, 60$ (FNA 5, PL).

HAB G-10 :: E 6. **ABU** g10? s9 -1?

1085--*Polygonum ramosissimum* Michx. T

Polygonaceae <Polygoneae>: *Polygonum ramosissimum* (var. r.)

This is a weedy hexaploid ($2n = 60$) up to 2 m tall that is widely scattered across temperate North America, except on the southeastern Coastal Plain. The plant appears to have been used for its edible seed during the Woodland era (Ford 1985), and it was reported from pond sediments of similar age in LARU (Wilkins 1985). But see also notes under *prolificum*, which is closely related. FNA 5 reported typical *ramosissimum* from Ky., but no coll. has been located with confirmed identification (M). There is a suggestive immature coll. from OLDH (DHL), and a sight record from TRIM (M); but these records may well refer to *prolificum* instead.

ALI W.

1086--*Polygonum prolificum* (Small) B.L. Robinson

Polygonaceae <Polygoneae>: *Polygonum prolificum* (*ramosissimum* var. p.) Mapping here is tentative. This species has often been treated as a variety (K) or subspecies (FNA) of *ramosissimum*, which may intergrade (Cr). FNA 5 reported *prolificum* from Ky., and M reported colls. from roadsides in BALL

and MERC. Reports from OLDH and TRIM may be based on typical *ramosissimum*. See also notes under *Polygonella americana*.

ALI w. **HAB** R-10,9? ::: E 6. **ABU** g10 s2? +2?

1087--*Polygonum tenue* Michx.

Polygonaceae <Polygoneae>: *Polygonum* <*Duravia*> *tenue*

This native diploid ($2n = 22$) is widely scattered in eastern states, but generally uncommon and restricted to dry infertile soils on or near non-calcareous outcrops.

HAB 12 = C 6. **ABU** g9? s4? -3?

1088--*Polygonella americana* (Fischer & Meyer) Small R

Polygonaceae <Polygoneae>: *Polygonella americana*

This is widely scattered on sandy soils in southeastern states, but mostly on the Coastal Plain; $2n = 36$ (FNA 5, W). The only potential record from Ky. is Rafinesque's (1836, 3:41) description of his *Plerostena serotina*, which has been considered a synonym of *Polygonella americana*: "a small shrub 2 or 3 feet high woody only at the base... growing in fields and glades in Kentucky... flowers green 2 to 5 together on short peduncles." It is possible that he was referring to *Polygonum ramosissimum* or *prolificum* instead (M)

1089--*Antenoron virginianum* (L.) Roberty & Vautier

Polygonaceae <Persicarieae>: *Antenoron* [*Polygonum**, *Tovara*] *virginianum*

This variable tetraploid ($2n = 44, 48$) is widespread in eastern North America. Its generic assignment remains controversial. It may become known as *Persicaria virginiana* (L.) Gaertner, as treated by W.

HAB 7,4,5 D 2. **ABU** g10 s10 -2.

1090--*Persicaria orientalis* (L.) Spach

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *orientalis*

This South Asian diploid annual ($2n = 22$) has been grown ornamentally for over a century, and sometimes escapes (Gm). Some colls. may not be from truly naturalized plants.

ALI EU. **HAB** F-10? ::: D 6. **ABU** +4.

1091--*Persicaria lapathifolia* (L.) S.F. Gray

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *lapathifolia*

This is a cosmopolitan diploid annual weed; efforts to distinguish segregates in the Western and Eastern Hemispheres have not been successful (FNA 5). See notes under *pensylvanica*.

ALI m. **HAB** f-9,10,1 ::: D 6. **ABU** g10 s10 +2?

1092--*Persicaria pensylvanica* (L.) G. Maza

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *pensylvanica* {+ var. *laevigata*}

This variable allo-octoploid ($2n = 88$) annual is probably derived in part from *lapathifolia* (Kim et al. 2008). Possible distinction of the northern var. *laevigatum* Fern. (as described within *Polygonum*), deserves further attention (F), but varieties within this species are not readily recognized (FNA 5). See also notes under *bicornis* and *careyi*.

HAB f-9,10,1 ::: D 6. **ABU** g10 s10 +2?

1093--*Persicaria bicornis* Raf.

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *bicornis* (*longistyla*)
The close relative of *pensylvanicum* occurs in the Great Plains, east to c. Mo. and s. Ill. The only known coll. from Ky. was made by D. Demaree in MCRA (6 Oct 1951; at PU). Horton (1972) did report it from Ky. but details are unknown. *P. bicornis* differs from *pensylvanicum* (FNA 5) in its consistently pink and heterostylous flowers (versus white to roseate and homostylous); its achenes with "an obscure or prominent hump in the center of one face"; and its frequently narrower leaves (ca. 1-2.3 cm versus 1-4.8 cm).

HAB f-9,10,1 ::: D 6. **ABU** g9? s2? +1?

1094--*Persicaria careyi* (Olney) Greene

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *careyi*
Further verification is desirable. This northeastern annual is close to *pensylvanicum* and differs in its stems, which are hirsute towards the base (versus glabrous); its ocreae, which have 2-7 mm bristles (versus none or <1 mm); and its leaf blades, which are more or less hirsute, especially on veins (versus glabrous or appressed-pubescent).

HAB f-10,9? ::: E? 6. **ABU** g8? s3? -3?

1095--*Persicaria maculosa* S.F. Gray

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *maculosa* (Po. *persicaria*)

This cosmopolitan annual weed is an allotetraploid ($2n = 44$) that probably originated in part from *lapathifolia* (Kim et al. 2008). The epithet *maculata* has been widely applied to the species (K), but apparently in error (FNA 5).

ALI EU. **HAB** F-10,9 ::: D 6. **ABU** +6.

1096--*Persicaria longiseta* (de Bruyn) Moldenke

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *longiseta* (*cespitosa* var. l.*)

This alien annual was first reported in North America ca. 1910, within northeastern regions, but it has now spread through most eastern regions (FNA 5). It has been confused with another East Asian species, *P. posumbu* (Buchanan-Hamilton ex D. Don) H. Gross (= *P. cespitosa* (Blume) Nakai), which is unknown in North America; $2n = 40$ in both taxa (Kim et al. 2008). The correct author citation has been unclear (K, W).

ALI AS. **HAB** f-7,10,4,1 ::: D 4. **ABU** +6*.

1097--*Persicaria hydropiper* (L.) Opiz

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *hydropiper*
This highly acrid annual is native or adventive in much of North America (F, FNA 5). In Ky. most records are from the northern Bluegrass, but it may be more widespread. *P. hydropiper* is a variable diploid ($2n = 18-24$). cited by Kim et al. 2008) that can be confused with *punctata* (F, FNA 5). Its seeds are minutely roughened and dull (versus smooth, lustrous). Its calices are mostly greenish or pink-purplish (versus whitish). Its inflorescences have lax arching-drooping branches (versus erect to spreading), and are generally more condensed, with axillary branches sometimes enclosed in ocreae (versus never) and subtended by regular leaves.

ALI N? **HAB** F-9? ::: E 6. **ABU** g10? s4? -3?

1098--*Persicaria punctata* (Ell.) Small

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *punctata* {+ vars. *confertifolia*, *leptostachya*}

Several varieties of this tetraploid ($2n = 40-44$) have been proposed, but some recent treatments have not considered these distinct enough to recognize (FNA 5); see also *robustior*. Most colls. from Ky. have been referred to var. *confertifolium* (Meis.) Fassett, within *Polygonum*, but further study is needed. The typical variety has been reported from CALL, HICK and MERC (M); it may be distinguished (Cr) by its rhizomatous habit (versus mostly annual), inflorescences less interrupted and terminating branches (versus often interrupted and branching from lower nodes), and achenes mostly trigonous (versus lenticular). The potential for confusion or intergradation of typical *punctatum* with *P. hydropiperoides* (especially var. *opelousanum*) needs further investigation.

HAB f-7,10,4,1 ::: D 4. **ABU** g10 s10 -1?

1099--*Persicaria robustior* (Small) Bickn.

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *robustior* (punctata var. majus)

Further records may be expected from closer study of material filed under punctata. *P. robustior* is a widely scattered perennial in eastern North America but concentrated on "peaty shores" in coastal regions (FNA 5). It differs from punctata in its inflorescences, which are uninterrupted (versus interrupted); its ocreolae are overlapping (versus mostly not), their margins with hairs lacking or sometimes up to 1 mm long (versus mostly with hairs up to 2 mm). Its leaves are 2-4.5 cm wide (versus 0.6-2.4 cm).

HAB 6,2? ::?: C? 4? **ABU** g9? s3? -3?

1100--*Persicaria glabra* (Willd.) M. Gómez W

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *glabra* (densiflora) This variable weed has a pantropical range (2n = 40, 60). Plants native to the Americas have been segregated as *P. densiflora* (Meisner) Moldenke, but were combined with *glabra* in FNA 5. There is only one confirmed Ky. record: from MADI (BEREA) in an artificial reservoir. Other colls. may exist but have not been relocated (BA, BT, M).

ALI s? **HAB** 6? ::? C? 4? **ABU** g10? s2? -3?

1101--*Persicaria setacea* (Baldw.) Small

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *setacea* (hydropiperoides var. s.)

Further study of colls. is needed. This diploid (2n = 20) segregate of *hydropiperoides* occurs mostly on the Coastal Plain of southeastern states, but it has probably been overlooked inland. It tends to occur in or around ponds that dry out more than typical habitat of *hydropiperoides*. Although variety status has often been preferred (B, Cr), little or no intergradation is reported (F, FNA 5, J, W, Kim et al. 2008). Mapped records include var. *interjecta* Fern (to which most material is referable) and var. *tonsa* Fern., which are not generally recognized in recent treatments.

P. setacea differs in its whiter calyx (versus usually pink or roseate towards the base); ocreae long-strigose, the fringing bristles ca. 5-15 mm long (versus short-strigose, 1-7 mm); larger leaves 12-35 mm wide and usually strigose (versus 5-25 mm, glabrous or scabrous); stems erect, 2.5-6 mm thick at base, strigose, often branching near middle, from rhizomes (versus ascending, 1-4 mm thick, usually glabrous, mostly simple, decumbent at base).

HAB 3,6? ~ D? 4? **ABU** g9? s8? -3?

1102--*Persicaria hydropiperoides* (Michx.) Small

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *hydropiperoides* (var. h.)

This subaquatic tetraploid (2n = 40) is widespread across North and Central America. Typical *hydropiperoides* in Ky. (including var. *buschianum* Stanford) has largely whitish calices (not roseate or purplish as stated in F). *P. setacea* is closely related and needs further study for reliable separation in the state; see notes under that name.

Another southern segregate to be expected has been named *P. opelousanum* Riddell, but this reportedly intergrades with typical plants (FNA 5) and may also be confused with typical *punctatum*. *P. opelousanum* differs from *setacea* (F) in its calices, which are dull purple to green (versus white to roseate), rhomboid to subglobose at maturity (versus elongate), the achenes slightly exerted (versus included); its leaves are no more than 1.5 cm wide (versus 2.5 cm).

HAB 2,3 ~ D 4. **ABU** g10 s10 -2.

1103--*Persicaria coccinea* (Muhl. ex Willd.) Greene

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *coccinea* (amphibia var. *emersa*)

In some recent treatments, this widespread North American species has been combined with the Eurasian species, *amphibia* (FNA 5), but it should probably be recognized, at least as *P. amphibia* var. *emersa* (Michx.) Hickman. Morphological and genetic differences may be small and gradual, but deeper analysis is needed.

HAB 2 ~ D 5. **ABU** g10 s8 -3.

1104--*Persicaria amphibia* (L.) S.F. Gray var. *stipulacea* (Coleman) Hara

Polygonaceae <Persicarieae>: *Persicaria* [*Polygonum**] *amphibia* var. *stipulacea* (Pe. *hartwrightii*, *Po. natans*)

P. amphibia is a variable polyploid is widespread across North America (2n = 66 to 132). In some recent treatments, the northern var. *amphibia* is combined with typical Eurasian *amphibia* and the more southern segregate, *coccinea* (FNA 5; W). That segregate is more aquatic than *coccinea*. Its only verified Ky. coll. is from WHIT (BEREA, Abbott et al. 2001); see also McFarland (1942).

HAB 1,2? ::? C? 5. **ABU** g10 s2 -3?

1105--*Truellum sagittatum* (L.) Soják

Polygonaceae <Persicarieae>: *Truellum* [*Polygonum**] *sagittatum*
This is widespread in eastern North America and East Asia. Its generic assignment remains controversial. The name *Persicaria sagittatum* (L.) Gross ex Nakai has been used in some recent treatments (W).

HAB 9,6 C 4. **ABU** g10 s10 -3.

1106--*Truellum arifolium* L.

Polygonaceae <Persicarieae>: *Truellum* [*Polygonum**] *arifolium*
The generic assignment of this northeastern species remains controversial. It may become known as *Persicaria arifolium* (L.) Haraldson, as treated by W. Most or all plants in Ky. were referred to var. *pubescens* (Keller) Fern. [in *Polygonum*], which has smaller seeds, but that northern segregate is not recognized in recent treatments.

HAB 2,6,9 C 4. **ABU** g10 s6 -4.

1107--*Ampelgynomium perfoliatum* (L.) Roberty & Vautier R

Polygonaceae <Persicarieae>: *Ampelgynomium* [*Polygonum**] *perfoliatum*
The generic assignment of this species remains controversial. *Persicaria perfoliata* (L.) H. Gross is the name used in some recent listings (W). It is an aggressive, scandent annual with rasping prickles that has become invasive across northeastern states, especially in woodland edges, roadsides and (amusingly) well-designed alien shrubberies. *A. perfoliatum* is spreading into the upper Ohio Rv. watershed. It has recently been reported from se. Ohio (R. Gardner, pers. comm.), including the Ohio River Islands National Wildlife Refuge, adjacent to Ky. (MASO, LEWI). There is no definitive report yet from within Ky. (SE).

ALI AS.

1108--*Brunnichia ovata* (Walt.) Shinnars

Polygonaceae <Coccolobeae>: *Brunnichia ovata* (*cirrhus*)
This occurs on lowlands in southeastern states, especially at the edges of swampy woods.

HAB 6,4,3 D 4? **ABU** g9 s8 -2.

1109--*Tamarix parviflora* DC. R

Tamaricaceae: *Tamarix parviflora* ("gallica")
This tree of the western Mediterranean region is presumably just cultivated in Ky. (M). But details of colls. from JEFF (NC, also Ind. Univ. SE) need

checking. *T. parviflora* is a segregate of *T. gallica* L., which has been broadly interpreted in older literature (W).

ALI EU.

1110--*Drosera rotundifolia* L. R

Droseraceae: *Drosera rotundifolia*
This northern (circumboreal) species was reported from Ky. by Short et al. (1933), but no coll. has been located. It does occur in the southern Appalachians, and it may be expected in the Cumberland Mts. of Ky.

1111--*Drosera intermedia* Hayne

Droseraceae: *Drosera intermedia*
This has a widespread circumboreal range. It was discovered in RUSS during 2001 by Martina Hines of KSNPC (Clark et al. 2005). There are also 19th Century colls. from BATH/ROWA (PH; Campbell et al. 1992) and EDMO/WARR (KY; Pr, handwritten addenda). Based on historical clues, probable localities for these old records have been indicated in various technical reports (KSNPC).

HAB 9,2 ::: B 6. **ABU** g10 s2 -6.

1112--*Drosera brevifolia* Pursh

Droseraceae: *Drosera brevifolia* (?*leucantha*)
In Ky. the single known population of this southeastern, carnivorous species was discovered in the 1970s by W. Meijer and students. Although this site at Hazel Dell (PULA) has been acquired by The Nature Conservancy, *D. brevifolia* and several other rare species are now threatened with lack of appropriate disturbance at the site.

HAB 9,10 ::: A 6. **ABU** g9 s2 -6.

1113--*Phytolacca americana* L.

Phytolaccaceae: *Phytolacca americana*
This is widespread in temperate North America. It is a truly amazing plant, with great potential for post-urban restoration, aesthetics, food, medicine, dye and poison; JC has personally experienced all of these uses.

HAB f-7,10 :: D 4. **ABU** g10 s10 =?

1114--*Mirabilis albida* (Walt.) Heimerl

Nyctaginaceae: *Mirabilis* <*Oxybathus*> *albida*
This is widely scattered on base-rich soils across North America, but most common in the Great Plains and generally rare to absent east of the

Mississippi. It appears to be native along sandy banks of the Mississippi Rv. in BALL (DHL).

ALI s. **HAB** 1? ::? C? 6. **ABU** g9? s2? =?

1115--Mirabilis nyctaginea (Michx.) MacM.

Nyctaginaceae: *Mirabilis* <*Oxybaphus*> *nyctaginea*

This has spread from its original range in the Great Plains, and now widely scattered in temperate North America.

ALI W. **HAB** H-10? ::? D 6. **ABU** +4.

1116--Mollugo verticillata L.

Molluginaceae [*Aizoaceae*]: *Mollugo verticillata*

This creeping annual is native throughout tropical America, but may have been present in eastern states before Columbus (FNA 4). It is locally abundant on damp rich bare soil, especially in cropland and along riverbanks. The first records in Ky. were at least a century ago (Gm); in Ohio and Michigan *Mollugo* was first collected ca. 1830 (FNA 4).

ALI s. **HAB** H-10,9,1,2 ::: D 6. **ABU** +6.

1117--Portulaca oleracea L.

Portulacaceae: *Portulaca oleracea*

This succulent edible weed is cosmopolitan but poorly represented in herbaria, because it resists drying when fresh and generally rots within plant presses.

Freezing, then frequent changing of blotters, is an effective method (M. Whitson, pers. comm.). *P. oleracea* is often stated to have an Asian origin, but there are several varieties, subspecies or closely related species with different original ranges across both Hemispheres of the World (Byrne & McAndrews 1975; FNA 4; W). Seeds of *Portulaca* have been determined from pre-Columbian archaeological sites in n. Ky. (Henderson 1998). In earlier floras of northeastern states, there were statements for *oleracea* such as "seemingly indigenous westw. and southwestw." (Robinson & Fernald 1908).

P. retusa Engelm. and *P. neglecta* MacKenz. & Bush are robust potential segregates, with more stamens (7-19 versus 6-10) and more sharply tuberculate seeds, which may be native to "rich bottomlands" of Mo., Ark. and further west in the Great Plains (F, Cr). The distinct southern species, *P. pilosa* L., may also be expected in the state (Ch; M. Whitsun, pers. comm.).

ALI AS? **HAB** H-10,1 ::: D 6. **ABU** +6?

1118--Portulaca grandiflora Hook. C

Portulacaceae: *Portulaca grandiflora*

This large-flowered South American species is sometimes cultivated (as "moss rose"), and it occasionally self-seeds into flower beds. However, there is no evidence of naturalization.

ALI SA.

1119--Claytonia virginica L.

Montiaceae [*Portulacaceae**]: *Claytonia virginica*

This is a variable species, widespread across eastern states, except the southeastern Coastal Plain. Chromosome numbers have a wide range: $2n = 12$ to 190. No attempt yet in Ky. has been made to separate the largely southern var. *acutiflora* DC., which has leaves only 1-2 (4) mm wide (versus mostly 5-10 mm), and chromosome numbers based on $n = 6$ or 7 (versus 8 or more). That taxon is known in s. Ill., and undoubtedly occurs in Ky. (Lewis & Semple 1977; Cr).

HAB 7,5,10 D 2. **ABU** g10 s10 -2.

1120--Claytonia caroliniana Michx.

Montiaceae [*Portulacaceae**]: *Claytonia caroliniana*

This occurs in northeastern regions and the Appalachians. Chromosome numbers can range from $2n = 16$ to 38 (FNA 4).

HAB 5 B 2. **ABU** g8 s8 -1.

1121--Talinum paniculatum (Jacq.) Gaertn. C

Talinaceae [*Portulacaceae**]: *Talinum paniculatum*

This cultivated species is native to the Caribbean region. It may occasionally escape but there is no evidence that it is spreading. It has been collected as a nursery weed in JEFF (KY-Agr.).

ALI SA.

1122--Phemeranthus teretifolius (Pursh) Raf.

Talinaceae [*Portulacaceae**]: *Phemeranthus* [*Talinum**] *teretifolius*

This Appalachian species is a tetraploid ($2n = 48$) derived from hybridization of the southern Appalachian *P. mengesii* (W. Wolf) Kiger and the widespread western *P. parviflorus* (Nutt.) Kiger (FNA 4), which both have diploid and tetraploid races. These two parental species may also be expected in Ky.

HAB 12 == A 6. **ABU** g7 s3 -1.

1123--Phemeranthus calcaricus (S. Ware) Kiger

Talinaceae [*Portulacaceae**]: *Phemeranthus* [*Talinum**] *calcaricus*

This tetraploid (2n = 48) is restricted to limestone glades of the southern Interior Low Plateaus and Ozarks. It is probably derived from the southwestern *P. calycinus* (Engelm.) Kiger, which has diploid and tetraploid races (FNA 4).

HAB 12 == E 6. **ABU** g6 s2 -2.

1124--*Opuntia cespitosa* Raf. ?

Cactaceae [Portulacaceae]: *Opuntia* cf. *cespitosa* (*humifusa** var. *cespitosa*, "compressa")

Revision of the variable *humifusa* complex by L. Majure (Univ. of Florida) and others is pending; 2n = 22 and 44. The common plants of base-rich clayey or calcareous soils in east-central states, including Ky., are referred here to *cespitosa* based on Majure's work in Miss. (2007; Majure & Ervin 2008), but their degree of distinction from typical *humifusa* across the whole range needs further investigation. Typical *humifusa* occurs mostly on sandy soils, especially in southeastern coastal states, and there are additional related taxa close to the coast (Sm, W, FNA 4). Typical *humifusa* is known from w. Tenn. and may also be expected in Ky. (D. Estes, pers. comm.).

Majure showed that *cespitosa* differs from *humifusa* in its reddish flower centers (versus all yellow), and the rusty-brown (versus tawny-brown) color of the small bristles on pads (known as glochids). Also, pads (the broadly flattened stems) tend to be larger (usually 3.8-10.5 x 3.2-8 cm versus 3.1-8.5 x 2-5.2 cm), consistently rotund to obovate (versus often ellipsoid), and darker green to bluish (versus usually yellowish green). Spines are not retrorsely barbed (versus often so).

O. tortispina Engelm. & Bigelow was also reported from Ky. by F, but probably in error. *O. tortispina* is a variable western species with probable hybrid origin, and it has been confused with the more widespread western species, *O. macrorhiza* Engelm. (Cr), or otherwise misinterpreted (FNA 4).
HAB g-12,10 == D 4. **ABU** g10 s9 -2?

1125--*Paronychia argyrocoma* (Michx.) Nutt.

Caryophyllaceae <Paronychioideae>: *Paronychia argyrocoma*
In Ky. this Appalachian perennial is known only from the "High Rocks" of Cumberland Mt. (HARL), overlooking Va.
HAB 12 +\ A 6. **ABU** g8 s2 =.

1126--*Paronychia fastigiata* (Raf.) Fern.

Caryophyllaceae <Paronychioideae>: *Paronychia fastigiata*
Segregates of this widespread eastern annual are not well understood; 2n = 32 and 36 (FNA 5, W). Further review of colls. across the state is needed to assess the degree of distinction. Colls. from BUTL, FLEM and MADI have been referred to var. *paleacea* Fern. BA reported *P. montana* (Small) Pax & K. Hoffmann (= *P. fastigiata* var. *pumila* (A. Wood) Fern.), based on a misidentified coll. of typical *fastigiata* from MARS (WK).

HAB 12,11 +\ C 4. **ABU** g10 s9? -1.

1127--*Paronychia canadensis* (L.) Wood

Caryophyllaceae <Paronychioideae>: *Paronychia canadensis*
This is widespread in eastern states, but rare to absent on the southeastern Coastal Plain. It is typical of thin dry woodland, especially on exposures of non-calcareous shaley soils. It is scattered across Ky., but there are few verified records from the Bluegrass region.

HAB 11,12 ::+ C 3. **ABU** g10 s9 -2.

1128--*Spergula arvensis* L.

Caryophyllaceae <Paronychioideae>: *Spergula arvensis*
ALI EU. **HAB** H-10 ::: E? 6. **ABU** +4.

1129--*Spergularia rubra* (L.) J.& K. Presl R

Caryophyllaceae <Paronychioideae>: *Spergularia* [*Spergula*] *rubra*
This alien is widely scattered across North America, especially along roadsides, but it is uncommon to rare in southern states. The only Ky. record is a coll. from LAWR (KY-Agr.), but this appears to be mislaid or on an extended unofficial loan (M).

ALI EU.

1130--*Spergularia salina* J.& K. Presl

Caryophyllaceae <Paronychioideae>: *Spergularia* [*Spergula*] *salina* ("marina")
This is a cosmopolitan annual of saltmarshes that has spread inland along salted highways.

ALI E. **HAB** R-9 ::: E? 6. **ABU** +4.

1131--*Stellaria pubera* Michx.

Caryophyllaceae <Alsinoideae>: *Stellaria pubera* (var. p.)
This is widespread in southeastern states, but only east of the Mississippi Rv.
HAB 5,7 C 2. **ABU** g10 s10 -2.

1132--*Stellaria corei* Shiners

Caryophyllaceae <Alsinoideae>: *Stellaria corei* (pubera var. *silvatica*)
 This occurs mostly in the central Appalachians and Interior Low Plateaus, on more base-rich soils than the closely related species, *pubera*. *S. corei* differs in its larger, smooth-backed sepals and its larger, more petiolate leaves on flowering shoots; $2n = 60$ versus 30 (Cr, FNA 5, W). Some incomplete colls. are difficult to assign. Both species produce relatively tall, persistent, non-flowering summer shoots, but *corei* often forms more extensive rhizomatous patches of these shoots.

HAB 5,4 D 1. **ABU** g9? s9 -3.

1133--*Stellaria neglecta* Weihe R

Caryophyllaceae <Alsinoideae>: *Stellaria neglecta* (*media* ssp. n.)
 This is closely related to *media* and *pallida* (FNA 5, Y). It differs from these species in its sepals 5-6.5 mm long (versus usually 3-5 mm); stamens 8-10 (versus usually 1-5); seeds 1.1-1.7 mm wide (versus 0.5-1.3 mm), with tubercles usually taller than broad (versus broader than tall), and with apex usually acute (versus obtuse). It is usually cross-pollinated (versus both crossed and selfed). *S. neglecta* has spread rapidly through North America since the 1980s, but there are still few available records from the Ohio Valley and the midwest (e.g. Y). FNA 5 reported it from Ky., and there may be a coll. from FRAN to be checked (M. Medley & J. Thieret for WKY). It remains unknown in Ohio (A. Cusick, pers. comm.).

1134--*Stellaria media* (L.) Vill.

Caryophyllaceae <Alsinoideae>: *Stellaria media* (ssp. m.)
 Introduced during early settlement, this virtually inerradicable annual has become a pervasive weed across North America on damp rich soil in woods and fields. In the central Bluegrass, Short (1828-9) noted: "In this locality it prefers rich woods or cultivated places, frequently covering patches of considerable extent."

S. media is a variable tetraploid ($2n = 40, 42, 44$), and colls. filed under this name need to be rechecked for *pallida* and *neglecta*; see notes under those names. Those two species are closely related diploids ($2n = 22$) that are easily overlooked (FNA 5, Y, W and cited literature). There is no evidence of interbreeding among these three species.

ALI EU. **HAB** f-10,7,4 :: D 4. **ABU** +6*.

1135--*Stellaria pallida* (Dumort.) Crépin

Caryophyllaceae <Alsinoideae>: *Stellaria pallida* (*media* ssp. p.)

This differs from *media* (FNA 5) in its 0-3 stamens (versus 3-5 (8)); sepals 3-4 mm long (versus 4.5-5 (6) mm); seeds mostly 0.5-0.9 mm wide and yellowish-green (versus 0.9-1.3 and brown); petals usually absent (versus present); and plants usually yellowish-green (versus regular green). It has certainly been overlooked, and further examination of colls. filed under *media* is needed. It is widely scattered in Mo. (Y) and Ohio (A. Cusick, pers. comm.). In Ky, the only records are colls. of J.W. Thieret (KNK).

ALI EU. **HAB** F-10,7? :: D? 4? **ABU** +4.

1136--*Stellaria longifolia* Muhl. ex Willd.

Caryophyllaceae <Alsinoideae>: *Stellaria longifolia*
 This northern (circumboreal) species of wet meadows and open woods on base-rich soils is rare to absent in most of Ky., Tenn. and more southeastern states (NS, PL, W). See notes under *graminea*.

HAB 9,6,2? :: D? 3. **ABU** g10 s2 -5.

1137--*Stellaria graminea* L.

Caryophyllaceae <Alsinoideae>: *Stellaria graminea*
 This alien is widely scattered in eastern North America, and it has probably been present in Ky. since early after settlement (Short 1840; Gm). However, it has remained rather uncommon and largely restricted to less fertile soils, especially in marginal pastures and old fields. *S. graminea* is a variable species that has sometimes been confused with *longifolia*, but it has more diffuse, many-flowered inflorescences; larger, strongly-nerved sepals; and larger, more tuberculate seeds; $2n = 26$ or 39 versus just 26 (Cr, FNA 4, W).
ALI EU. **HAB** G-10,7? :: C 4. **ABU** +5<.

1138--*Stellaria fontinalis* (Short & Peter) B.L. Robins.

Caryophyllaceae <Alsinoideae>: *Stellaria fontinalis* (Sagina, Arenaria, Alsine f.)

This globally imperiled species is an early spring annual that is restricted to wet cliffs and seeps on limestone in c. Ky. and c. Tenn. Its numbers can vary much from year to year, and several small populations in Ky. appear to have disappeared during the past 30 years. The species is often treated in *Stellaria*, and it also appears close to *Sagina* and *Minuartia* (FNA 5).

HAB 6,4,5 ~| E 3. **ABU** g4 s3 -1.

1139--*Myosoton aquaticum* (L.) Moench

Caryophyllaceae <Alsinoideae>: *Myosoton* [*Stellaria**] *aquaticum*

This Eurasian species (in a monotypic genus) has spread to wetlands of northeastern regions. It remains infrequent in Ky., with records only from northern counties bordering the Ohio Rv.

ALI EU. **HAB** 9,2 E? 4. **ABU** +4.

1140--*Cerastium velutinum* Raf.

Caryophyllaceae <Alsinoideae>: *Cerastium velutinum* (arvense* var. ve.)

This tetraploid perennial ($2n = 72$) of rocky woods on base-rich soils occurs in scattered, somewhat disjunct regions from northeastern states to the upper midwest (FNA 5). In Ky. the only locality with an extensive well-documented population is in JESS at Jessamine Gorge (Campbell & Meijer 1989). *C. arvense* L., strictly defined, is a more northern diploid, but further revision is anticipated (Morton 2004). Ky. plants are similar to *C. arvense* var. *villosum* (Muhl. ex Darl.) Hollick & Britt., which may deserve distinction from typical *velutinum* under a new combination.

HAB 12,11 E 3. **ABU** g8? s4? -1.

1141--*Cerastium semidecandrum* L.

Caryophyllaceae <Alsinoideae>: *Cerastium semidecandrum*

This diploid ($2n = 36$) is close to *pumilum* and *vulgare*, widely scattered in North America and often overlooked, but it is probably much less common (Y). The only records from Ky. are colls. of J.W. Thieret (KNK).

ALI EU. **HAB** S-10 ::: D? 6. **ABU** +4.

1142--*Cerastium pumilum* W. Curtis

Caryophyllaceae <Alsinoideae>: *Cerastium pumilum* (?glutinosum)

This tetraploid ($2n = 72$) is similar to *vulgare*, widely scattered in northeastern states and often overlooked (FNA 5, Y, W). In Ky. it has been recorded only after 1960 (M). The name *C. glutinosum* Nutt. is considered synonymous with *pumilum*, in part, but its early usage in Ky. (e.g. Short et al. 1833) was probably for *nutans* (M).

ALI EU. **HAB** S-10 ::: C? 6. **ABU** +5.

1143--*Cerastium vulgare* Hartman

Caryophyllaceae <Alsinoideae>: *Cerastium vulgare* (triviale, "vulgatum"; *fontanum* ssp. *vulgare*)

This cosmopolitan weed from Europe is an octoploid ($2n = 144$) that is often combined as a subspecies with *C. fontanum* Baumg., sensu stricto, which occurs only in cooler regions of Europe. *C. vulgatum* L. is an ambiguous name proposed for rejection (FNA 5).

Although *vulgare* is often described as perennial, that character is not obvious in most colls., and biennial or annual behavior may also occur. It can usually be distinguished from *glomeratum* and *allies* (Cr, FNA 5) by its larger capsules (mostly 8-10 x 2-3 mm versus 6-8 x 1.5-2 mm), sepals that lack long distal hairs, and longer pedicels in mature old inflorescences (up to 5-12 mm versus 1-5 mm).

ALI EU. **HAB** G-10,8 ::: D 6. **ABU** +6.

1144--*Cerastium nutans* Raf.

Caryophyllaceae <Alsinoideae>: *Cerastium nutans* (var. n.*)

This native diploid ($2n = 34, 36$) is typical of moderately disturbed submesic to subhydric woodlands and edges on fertile soils. However, it is rather uncommon and appears to have been generally grazed, mowed or choked out of more heavily farmed, weedy landscapes.

HAB 4,6,7 :: D 3? **ABU** g10 s9? -3.

1145--*Cerastium brachypodum* (Engelm. ex Gray) B.L. Robins.

Caryophyllaceae <Alsinoideae>: *Cerastium brachypodum* (*nutans* var. b.*)

This diploid ($2n = 34$) is close to *nutans*, but generally distinct (FNA 5). It has a widespread western range, and extends into Ky. and Tenn. along major river valleys. It is typical of more open weedy habitats.

ALI w. **HAB** F-10,12? :: C? 6. **ABU** g10 s6? +4?

1146--*Cerastium dubium* (Bast.) Guépin

Caryophyllaceae <Alsinoideae>: *Cerastium dubium*

The first North American record of this diploid ($2n = 36, 38$) was in 1966 (FNA 5), but it has spread rapidly to many states. It is close to the more southern tetraploid, *C. diffusum* Pers., which has been found in se. Mo. and is expected in Ky.

ALI EU. **HAB** H-10,12? ::: C? 6. **ABU** +4.

1147--*Cerastium glomeratum* Thuill.

Caryophyllaceae <Alsinoideae>: *Cerastium glomeratum* ("viscosum")

This cosmopolitan annual weed is a highly variable tetraploid ($2n = 72$), and most colls. need rechecking for other species: especially *semidecandrum*, *brachypetalum* or *pumilum*, but also *vulgare* (see notes under latter). Both *glomeratum* and *vulgare* become common during early settlement (Short 1928-29), especially in overgrazed bluegrass pastures (Gm). *C. viscosum* L. is an ambiguous name proposed for rejection (FNA 5).

ALI EU. **HAB** G-10,8 ::: D 6. **ABU** +6.

1148--*Cerastium brachypetalum* Desportes ex Pers.

Caryophyllaceae <Alsinoideae>: *Cerastium brachypetalum*

This is close to *glomeratum*, and often overlooked; it has become widespread across southeastern states (FNA 5). In addition to its long silvery hairs, more open panicles, and relatively narrow leaves, the plant is relatively large and diffusely branched (Y); $2n = 88, 90$.

ALI EU. **HAB** S-10 ::: D 6. **ABU** +5.

1149--*Holosteum umbellatum* L.

Caryophyllaceae <Alsinoideae>: *Holosteum umbellatum*

This is a widespread weedy annual in North America, especially on relatively infertile soils.

ALI EU. **HAB** H-10 ::: C? 6. **ABU** +5.

1150--*Sagina decumbens* (Ell.) Torr. & Gray

Caryophyllaceae <Alsinoideae>: *Sagina decumbens*

This small weedy native annual is widely scattered over eastern North America. It often grows in gravel roads, beneath the feet of botanists, but tends to be overlooked in general floristic surveys.

HAB s-12,10,9? ::: C? 6. **ABU** g9? s6? -1?

1151--*Sagina procumbens* L.

Caryophyllaceae <Alsinoideae>: *Sagina procumbens*

This weedy Eurasian perennial is widely scattered over northern North America, where it may be native in some regions (FNA 5). It has been collected from BRAC (A. Cusick, pers. comm.) and BOON (Poindexter & Thompson 2008).

ALI N? **HAB** S-12,10? ::: C? 6. **ABU** g9? s3? -1?

1152--*Arenaria leptoclados* (Reichenb.) Guss.

Caryophyllaceae <Alsinoideae>: *Arenaria leptoclados* (*serpyllifolia* var. *tenuior*, ssp. l.)

The only known coll. of this largely northeastern species may be from WOOD (DHL+; Wharton 1945, FNA 5). It is diploid ($2n = 20$), in contrast to the closely related tetraploid, *serpyllifolia* ($2n = 40$), which has larger leaves and flowers. The latter is much more widespread in temperate regions, but colls. need to be rechecked for *leptoclados*. Although generally considered alien in

North America, the status of both taxa in northern regions may be somewhat uncertain (F).

ALI EU. **HAB** S-10,12 ::: D 6. **ABU** +4?

1153--*Arenaria serpyllifolia* L.

Caryophyllaceae <Alsinoideae>: *Arenaria serpyllifolia* (var. s.)

This weedy annual is widespread in temperate North America, especially along roads and railroads with gravelly or sandy soils. *A. serpyllifolia* was first reported from Ky. in the 1940s (McFarland 1942, B). It has generally been under-collected and may well occur in all counties. See also notes under *leptoclados*.

ALI EU. **HAB** S-10,12 ::: C? 6. **ABU** +5.

1154--*Minuartia cumberlandensis* (B.E. Wofford & Kral) McNeill

Caryophyllaceae <Alsinoideae>: *Minuartia* [*Arenaria*] *cumberlandensis*

This globally threatened annual is known only from under sandstone cliffs of the Cumberland Plateau in n. Tenn. and se. Ky. The plants discovered by M. Medley and J. Thieret during 1984 along Rock Cr. in sw. MCRE (KNK) have not been refound, despite several attempts. However, A. Risk discovered a good stable population during 1994 close to the Big South Fork in n. MCRE (MDKY).

HAB 5 // B 3. **ABU** g4 s2 -1.

1155--*Minuartia glabra* (Michx.) Mattf.

Caryophyllaceae <Alsinoideae>: *Minuartia* [*Arenaria*] *glabra* (*A. groenlandica* var. *glabra*)

This Appalachian species occurs mostly on granitic rocks or sandstones at moderate to low elevation (W). In Ky. it mostly occurs on gently sloping to flat outcrops of sandstone, sometimes associated with *PheMERanthus teretifolius*. It appears to be a short-lived perennial, based on cultivation in a rock-garden by JC.

HAB 12 == A 6. **ABU** g9 s3 -1.

1156--*Minuartia patula* (Michx.) Mattf.

Caryophyllaceae <Alsinoideae>: *Minuartia* [*Arenaria*] *patula* (var. p.)

This annual occurs mostly on calcareous outcrops and roadsides in the Ozark region, Interior Low Plateaus and other calcareous regions in midwestern and southeastern states. See notes under *muscorum*.

HAB r-12 == E 6. **ABU** g9 s9 -1?

1157--*Minuartia muscorum* (Fassett) Rabeler T

Caryophyllaceae <Alsinoideae>: *Minuartia* [*Arenaria*] *muscorum* (*patula* var. *robusta*)

This has generally been treated as *M. patula* var. *robusta* (Steyermark) Maguire. It is known mostly from the Ozark region, where it is typical of "sandy openings of mesic upland forests; also open, disturbed areas" (Y). Disjunct eastern populations have been reported in Ga., Ala., Tenn. and Ky. (as reviewed by M and FNA 5). At least in Ky., such disjunct plants have no clear difference from *patula* in distribution or life history (Baskin & Baskin 1982), and they are not mapped separately here (but see Ch and PL).

Typical *muscorum* differs from typical *patula* in its 3-veined sepals (versus 3-5); leaves mostly 1.5-3.2 mm wide (versus 0.5-1.5 mm); seeds black and muriculate-papillate (versus reddish-brown to black and tuberculate). R.K. Raebeler et al. (in FNA 5) indicated that occasional plants "from Ga., Ky. and Va. have glabrous sepals with only three strong veins, resembling those of *muscorum*; in other features, including the seeds, they are clearly referable to *patula*. The status of the plants with three-veined sepals remains ambiguous..."

1158--*Minuartia michauxii* (Fenzl) Farw.

Caryophyllaceae <Alsinoideae>: *Minuartia* [*Arenaria*] *michauxii* (var. *m.*; "A. *stricta*")

This is a widespread, variable species, typical of base-rich outcrops. Typical *michauxii* occurs from northeastern regions to Ark., Mo., Ohio, Va. and perhaps S.C. (F). There is an old coll. of C.W. Short (PH) from "wet rocky places", presumed by M to come from near Hopkinsville (CHRI). There is also a sight record from POWE (M). While somewhat tenuous, its occurrence in Ky. was also accepted by F and FNA 5.

HAB 12 +\? C? 6. **ABU** g8? s2? -2?

1159--*Scleranthus annuus* L.

Caryophyllaceae <Alsinoideae>: *Scleranthus annuus*

This alien annual is widely scattered in humid temperate regions of North America. It has increased much during recent decades on sandy soils in the Mississippi Valley (Y), and has probably been overlooked in western regions of Ky. Records from the state are mostly dated after 1980.

ALI EU. **HAB** H-10? ::: C? 6. **ABU** +4.

1160--*Silene coronaria* (L.) Clairville

Caryophyllaceae <Silenoideae>: *Silene* (*Lychnis*) *coronaria*

This perennial is escaped from cultivation (as "mullein pink" or "rose-campion") at scattered sites in eastern states. In Ky. there are few records: a coll. in 1942 from LIVI (KY-Agr. Sch.); and colls. ca. 1970 from two adjacent counties (R. Athey colls., probably at MEM). See R.K. Rabeler in Y for notes on generic treatment.

ALI EU. **HAB** F-10 ::: C? 6. **ABU** +4.

1161--*Silene latifolia* Poir.

Caryophyllaceae <Silenoideae>: *Silene* (*Lychnis*) *latifolia* (*alba*, *pratensis*) This biennial (or short-lived perennial) is widespread in North America. *S. alba* (Mill.) E.H.L. Krause is closely related and often treated as a subspecies in Europe. In North America, intermediate plants predominate and the name *latifolia* takes precedent (FNA 5), but plants have often been named *Lychnis alba* Mill. in older literature. Another closely related, intergrading perennial species, *S. dioica* (L.) Clairville (= *Lychnis d.*), has been reported from Ky., but no coll. has been located (M). There has also been confusion in nomenclature with *S. vulgaris*.

ALI EU. **HAB** F-10 ::: E 6. **ABU** +5.

1162--*Silene dichotoma* Ehrh.

Caryophyllaceae <Silenoideae>: *Silene dichotoma* (ssp. *d.*)

Although this annual is widely distributed across North America, especially northern states, it may generally be just "an occasional adventive weed" (FNA 5). The only reported colls. in Ky. date from ca. 1910 to 1940 (KY-Agr.; Gm; Rogers 1941).

ALI EU. **HAB** F-10 ::: E? 6. **ABU** +4.

1163--*Silene noctiflora* L.

Caryophyllaceae <Silenoideae>: *Silene noctiflora*

This is a widely scattered annual in temperate North America, but it does not seem to be increasing in Ky. Most records date from 1910-1940 (Gm, B, M). The few colls. during more recent decades were by J. Thieret in the northern Bluegrass.

ALI EU. **HAB** F-10 ::: D 6. **ABU** +4.

1164--*Silene antirrhina* L.

Caryophyllaceae <Silenoideae>: *Silene antirrhina*

This annual may be native across much of temperate North America. It is especially common along roadsides and railroads in eastern states, and may be somewhat adventive. But Gm considered it native: "a rather common weed in

Kentucky meadows" including clover fields. *S. antirrhina* is diploid ($2n = 24$), like the alien species of *Silene* in eastern states.

ALI w. **HAB** R-10 ::: D 6. **ABU** g10 s10 +2?

1165--*Silene csereii* Baumg.

Caryophyllaceae <Silenoideae>: *Silene csereii*

This alien biennial has become documented in eastern states mostly since 1990 (Cr, FNA 5, W). In Ky. it is known only from colls. of J. Thieret along railroads and roadsides in CAMP (KNK).

ALI EU. **HAB** F-10? ::: D? 6. **ABU** +4.

1166--*Silene vulgaris* (Moench) Garcke

Caryophyllaceae <Silenoideae>: *Silene vulgaris* (cucubalus; latifolia var. pubescens)

This rhizomatous perennial is widely scattered in North America, but generally less common than true *latifolia*, which has been confused. Early reports of "*latifolia*" generally refer to *vulgaris*; see notes under *latifolia*.

ALI EU. **HAB** F-10 ::: D 6. **ABU** +4.

1167--*Silene nivea* (Nutt.) Muhl. ex Otth

Caryophyllaceae <Silenoideae>: *Silene nivea* ("alba")

This is an uncommon native rhizomatous perennial of fertile alluvial woods in midwestern states, locally eastward to Pa. and Tenn. It was reported by Abbott et al. (2001) from Manchester Island, in the Ohio River (LEWI). It is related to the European species, *S. vulgaris*, but tetraploid ($2n = 48$ versus 24) like virtually all other native species of *Silene* in eastern states.

HAB 1,4 D? 3. **ABU** g7? s2 -2?

1168--*Silene ovata* Pursh

Caryophyllaceae <Silenoideae>: *Silene ovata*

This occurs in southern Appalachian regions and scattered disjunct localities westward to Ark., mostly on mesic wooded slopes with base-rich rocky soils. It is generally rare and deserves global listing for protection. In Ky. it is known only from a few records in the Cumberland Mts. and the Shawnee Hills, plus two sites in POWE discovered by D. Dourson during the 1990s (coll. to D. Taylor for EKY).

HAB 5,11 D 2. **ABU** g5? s2 -2?

1169--*Silene wherryi* Small

Caryophyllaceae <Silenoideae>: *Silene wherryi* (carolinana ssp. w.*)

This taxon is restricted to disjunct regions of s. Ohio, c. Ky., c. Ala., s. Mo and perhaps elsewhere. In Ky. it occurs on limestones and on black acid shale. A few colls. from ROWA and MONT (KY) may be transitional to the northeastern *S. pennsylvanica* Michx. Both taxa have been combined as varieties or subspecies with the strictly southeastern *S. caroliniana* Walt., but treatments have been inconsistent and further revision is desirable (FNA 5, W). Recent molecular analysis indicates that these three taxa are about as distinct from each other as they are from *virginica*, with which they can hybridize (Burgleigh & Holtsford 2003).

HAB 11,12 \ C 3. **ABU** g8 s8 -1.

1170--*Silene virginica* L.

Caryophyllaceae <Silenoideae>: *Silene virginica*

This is widely scattered across east-central states, including Ky. More robust plants with relatively small calices in central Appalachian regions have been named var. *robusta* Strausbaugh & Core. That taxon has been reported from Ky. but further review is needed to assess its status (Stausbaugh & Core 1978; W).

HAB 11,7 :: C 3. **ABU** g10 s10 -2.

1171--*Silene rotundifolia* Nutt.

Caryophyllaceae <Silenoideae>: *Silene rotundifolia*

This mostly occurs under sandstone cliffs in the Appalachian Plateaus, but in Ky. it also occurs further west under limestone along the Kentucky River Palisades, and in sandstone ravines of the Shawnee Hills.

HAB 5,11 // C 2. **ABU** g8 s8 =.

1172--*Silene regia* Sims

Caryophyllaceae <Silenoideae>: *Silene regia*

This globally threatend grassland species occurs at scattered localities in midwestern and southeastern regions. It often survives along rights-of-way rather or in other degraded habitats rather than good remnants of native vegetation. In Ky. it is currently known from just HARD and HART, but there are old records from at least four other counties; see M and KSNPC for details.

HAB 10,7 C 4. **ABU** g5? s2 -5.

1173--*Silene stellata* (L.) Ait. f.

Caryophyllaceae <Silenoideae>: *Silene stellata*

This perennial is widespread in east-central states. A few colls. have been referred to var. *scabrella* Palmer & Steyermark (e.g. B), but that taxon has not been recognized in recent treatments.

HAB 7,11 D 3. **ABU** g10 s10 -2.

1174--*Atocion armeria* (L.) Raf. R

Caryophyllaceae <Silenoideae>: *Atocion* [*Silene*] *armeria*

This is often cultivated and has become somewhat weedy in northeastern and northwestern regions, but it remains rare to absent in southeastern states.

There have been a few reports from Ky., from C.S. Rafinesque (under various synonyms) to FNA 5, but colls. have not been located (M). See R.K. Rabeler in Y for review of generic treatment.

ALI EU.

1175--*Agrostemma githago* L.

Caryophyllaceae <Silenoideae>: *Agrostemma* *githago*

This tall annual has been a common agricultural weed in eastern states. First recorded in Ky. during 1880-1893 (M), it was "one of the unquestionably dangerous plants" in 1914, due to its toxic saponins (Gm). Gm noted: "it grows among small grains and not among corn (maize). It is frequently seen also along roadsides and in fence corners." However, in 1943 B added: "no longer common." Today, it is widely scattered but generally infrequent to rare. The decline has presumably been due to changes in agricultural practices.

ALI EU. **HAB** H-10 ::: D 6. **ABU** +4<.

1176--*Saponaria officinalis* L.

Caryophyllaceae <Silenoideae>: *Saponaria* *officinalis*

Formerly much cultivated, this alien is now a widespread weed in temperate North America, especially along roads and railroads. Ga noted: "Everywhere along pikes, railroads, and about old premises... It is one of the old-time ornamentals belonging to the period of the Star-of-Bethlehem, periwinkle and blackberry lily."

ALI EU. **HAB** R-10 :: D 5. **ABU** +5.

1177--*Vaccaria hispanica* (P. Mill.) Rauschert W

Caryophyllaceae <Silenoideae>: *Vaccaria* [*Saponaria*] *hispanica* (*pyramidata*, *S. vaccaria*)

This alien is widely scattered across cool temperate regions of North America, but generally rare in southern states. In Ky. it is known only from an old coll. in GALL (Univ. of Cincinnati), with B's note "occasional on roadsides."

ALI EU. **HAB** R-10 ::? D? 6. **ABU** +4.

1178--*Dianthus barbatus* L. C

Caryophyllaceae <Silenoideae>: *Dianthus* *barbatus*

This commonly cultivated species ("sweet-william") may occasionally persist or escape, but it does not seem to become truly naturalized in eastern states.

There is a coll. of dubious status from a "vacant lot" in JEFF (DHL).

ALI EU.

1179--*Dianthus armeria* L.

Caryophyllaceae <Silenoideae>: *Dianthus* *armeria*

This alien has been widespread in pastures across northeastern states since Gray's (1864) time or earlier. Although widespread in Ky., it is usually just infrequent to rare. Gm noted: "In meadows. Eaten and said to be relished by horses. Not common except locally." Several other showy species of *Dianthus* or the related *Petrorhagia* may occasionally escape from cultivation but do not appear truly naturalized.

ALI EU. **HAB** G-10 ::? D 5. **ABU** +5.

1180--*Dianthus plumarius* L. C

Caryophyllaceae <Silenoideae>: *Dianthus* *plumarius*

This commonly cultivated species ("garden pink") may occasionally persist or escape, but does not seem to become truly naturalized in eastern states. There is an apparently wild coll. from ROWA (MDKY).

ALI EU.

1181--*Petrorhagia prolifera* (L.) P.W. Ball & Heywood C

Caryophyllaceae <Silenoideae>: *Petrorhagia* [*Dianthus*] *prolifera*

This cultivated species ("childing pink") can become a weed in more northern and eastern states (PL, W), but it does not appear to have become truly naturalized in Ky. The only wild record is a coll. of B from roadsides in ROBE.

ALI EU.

1182--*Cycloloma atriplicifolium* (Spreng.) Coult.

Chenopodiaceae [*Amaranthaceae*]: *Cycloloma* *atriplicifolium*

This annual occurs mostly in the southern Great Plains. In Ky. it appears to be native on or near sandy banks of Mississippi Rv. and lower Ohio Rv. But, in general, the species is adventive in southeastern states, especially along railroads (as in CAMP).

HAB 1 ::: D 6. **ABU** g9? s5? -1?

1183--Chenopodium murale L.

Chenopodiaceae [Amaranthaceae]: *Chenopodium murale*

This diploid (2n = 18) is widely naturalized in North America, but generally uncommon or rare. Its status and habitats in Ky. are not clear. Records of Gm, McFarland (1942) and others appear to have been based on misidentified album (M), and there may also be confusion with simplex.

ALI EU. **HAB** F-10 ::: D? 6? **ABU** +4.

1184--Chenopodium standleyanum Aellen

Chenopodiaceae [Amaranthaceae]: *Chenopodium standleyanum* ("boscianum")

This diploid (2n = 18) is widespread in eastern North America, typically in submesic to subxeric woods on base-rich soils, especially where soil is disturbed. It has also been reported on bottomlands, but there has probably been confusion with other species in some cases. In Ky., standleyanum and simplex are the only members of Chenopodiaceae to exhibit significant shade tolerance. In older literature the name *C. boscianum* Moq. was misapplied to standleyanum, and several records of "boscianum" should probably be reassigned here.

HAB 11,7 ::+ E 3. **ABU** g10 s8 -2.

1185--Chenopodium pratericola Rydb.

Chenopodiaceae [Amaranthaceae]: *Chenopodium pratericola* (dessicatum var. leptophylloides, "leptophyllum")

This diploid (2n = 18) is widespread across temperate North America, except in southeastern states, where perhaps just adventive. Some colls. may need to be rechecked for other species. *C. pratericola* has narrow leaves that lack secondary veins, but larger leaves are 3-nerved from the base. Similar leaves are typical of *C. pallescens* Standl. of the southern Great Plains, and *C. dessicatum* A. Nelson of more western states, which both may be expected in Ky. as waifs (Y). *C. pratericola* may also be confused with the "lanceolatum" variant of album, which does have secondary veins, and no leaves 3-nerved from the base.

ALI w. **HAB** F-10 ::: C? 6. **ABU** g10 s5? -2?

1186--Chenopodium missouriense Aellen

Chenopodiaceae [Amaranthaceae]: *Chenopodium missouriense* ("paganum"; album var. m.)

This is widespread across much of North America, but perhaps native only to the Great Plains and midwest. Distinction from the closely related album (an alien in its strict sense) and standleyanum (a native) needs further study; some authors combine missouriense with album (e.g. W). Although perhaps associated with archaeological sites of Woodland age in east-central states, identification of seeds from these sites needs confirmation (Ford 1985). There is no evidence of domestication as in buschianum, which is found much more frequently in Woodland sites.

C. missouriense may be distinguished from album as follows (Cr, St, FNA 4): leaves broader in shape, the lower ones with l/w no more than 1.5 (versus 1.5-2+); stems with purple nodes at leaf bases; inflorescence less compact, more delicate and flexuous; and seed smaller (ca. 0.9-1.2 mm versus 1-1.5 mm long). It is reported to flower only during Sep-Oct (versus May to Oct).

HAB H-10,1 ::: D 6. **ABU** g8? s8? -2?

1187--Chenopodium album L.

Chenopodiaceae [Amaranthaceae]: *Chenopodium album* (var. a.)

In its narrow sense, this cosmopolitan weedy taxon probably originated in Eurasia, but it has been combined in various treatments with some native species, especially missouriense (and see notes under var. lanceolatum). These taxa are reportedly all hexaploids (2n = 54). There has also been some confusion with the tetraploid berlandieri complex, including bushianum. Both groups of plants appear to have a deep, ancient association with mankind, providing useful food in cooked greens and ground seeds.

ALI EU? **HAB** H-10 ::: D 6. **ABU** +6.

1188--Chenopodium album L. var. lanceolatum Muhl. ex Willd.) Coss & Germ. T

Chenopodiaceae [Amaranthaceae]: *Chenopodium album* var. lanceolatum
These plants have been combined with typical album in most recent treatments, but may warrant at least informal recognition (FNA 4) or suggest introgression with boscianum (Y). They differ from typical album (F, St, FNA 4) in their leaves, which are usually lanceolate to narrowly ovate, entire, dark green, glabrous (versus broader rhombic, toothed, glaucous, farinose); inflorescences are more interrupted, with pedicels below some flowers (versus sessile); and seeds are smaller (1-1.2 mm versus 1.3-1.5 mm long). In contrast to album, lanceolatum may be native in North America, and is often associated with vacant lots and roadsides (versus cultivated fields), often with a more sprawling habit. In Ky, these plants do appear distinct sometimes (e.g.

JC from HARR for KY), but may be also associated with stress or regrowth after mowing.

1189--Chenopodium giganteum D. Don

Chenopodiaceae [Amaranthaceae]: *Chenopodium giganteum* (+ *centrorubrum*; *album* var. c.)

Further revision is needed. *C. giganteum* and *C. centrorubrum* (Makino) Nakai are closely related Asian taxa that are provisionally mapped here together. Compared to typical *album* (FNA 4), these taxa are relatively robust, with stems up to 2-3 m, and more densely farinose; leaves are up to 15 cm long, often distinctly 3-lobed (versus weakly lobed), and dentate to entire (versus densely dentate); seeds are reportedly smaller, on average.

C. centrorubrum (or *album* var. *centrorubrum* Makino) is a densely reddish-farinose plant (Ohwi 1975) that has been rarely reported in North America, but it is represented by colls. (MM for WKY) from HARR (around Pine Mt. Settlement School) and JEFF (widely escaped from cultivation of R. Cassell). This taxon may be much more widespread, but it is frequently difficult to distinguish from *giganteum* (FNA 4).

ALI AS. HAB H-10 ::: D 6. ABU +5?

1190--Chenopodium berlandieri Moq. var. zschackei (Murr.) Murr. ex Asch. T

Chenopodiaceae [Amaranthaceae]: *Chenopodium berlandieri* var. *zschackei*
This species is a variable tetraploid ($2n = 36$) that is widespread across much of North America, but uncommon to absent in most southeastern states (Cr, St, FNA 4, Y). The *berlandieri* group (including *buschianum*) has seeds clearly roughened with cellular reticulation (when viewed at $\times 10$ -20), versus smooth or obscurely roughened in the *album* complex. They also tend to have more open, slenderly branched inflorescences, with more distinct larger glomerules (ca. 4-7 mm wide versus 3-4 mm), and larger stigmas (ca. 0.3-0.5 mm versus 0.2-0.3 mm).

Var. *zschackei* is widespread in western and central North America, but perhaps only adventive in eastern states (FNA 4, W). It is locally frequent in sw. Ohio (D. Boone, pers. comm.), and a coll. from CAMP (KNK) in Ky. appears transitional from var. *zschackei* to the more eastern *C. buschianum*. Seeds of *zschackei* are smaller (ca. 1.1-1.5 mm long versus 1.5-2.3 mm), with thicker coats; style bases are distinctly yellowed; its leaves are generally less bright green; and plants tend to have an unpleasant odor.

Var. *boscianum* (Moq.) Wahl is a narrow-leaved relative with even smaller seeds that occurs mostly in coastal counties from Tex. to Va.; reports of it from Ky. (M) are probably based on *standleyanum* (see notes under that name).

ALI w?

1191--Chenopodium bushianum Aellen

Chenopodiaceae [Amaranthaceae]: *Chenopodium bushianum* (*berlandieri* var. *buschianum*; "*paganum*")

This close relative of *berlandieri* (see notes under that name) has been confused with *missouriense* and others, partly through misapplication of the name *C. paganum* Reichenb. (= probably a Eurasian form of *album*). *C. buschianum* may have originated in midwestern regions, but was apparently spread east to northeastern regions, widely cultivated and selected for its relatively large edible seeds, ca. 1000-4000 years ago (Ford 1985, Smith 2006). In Ky. *buschianum* is currently known from only a few colls. on or near banks of the Ohio Rv., but there are records from archaeological sites in the Appalachian Cliff Section.

Based on this archaeological work, other weed seeds were also eaten, especially ca. 1000-2000 years ago, and some were apparently cultivated as well, including *Polygonum erectum*, *Phalaris caroliniana*, *Hordeum pusillum*, *Iva annua* and *Helianthus annuus*, with lesser amounts of *Ambrosia trifida*, *Amaranthus* sp., *Portulaca* sp., *Galium* sp., etc. Such species probably occurred along edges of trails, campsites and villages, and in some cases on fresh alluvium. Corn and beans largely replaced these species in the diet ca. 1000-1500 years ago.

ALI w? HAB 4,1? ::: E? 6. ABU g? s4? -1?

1192--Chenopodium simplex (Torr.) Raf.

Chenopodiaceae [Amaranthaceae]: *Chenopodium simplex* (*gigantospermum*, *hybridum* var. s./g.)

This unusually large-leaved tetraploid ($2n = 36$) is widespread across North America, but rare to absent in most southeastern states (PL). In Ky. it is known mostly from ravine forests under limestone or sandstone cliffs; in Tenn. it is known only around the adjacent Cumberland Plateau (Ch). *C. simplex* has relatively large seeds (ca. 1.5-2.5 mm long), and is associated with archaeological sites of Woodland age. It does not seem to have been widely domesticated as in *buschianum* (Ford 1985), but especially large-

seeded plants (ca. 2-3 mm) from the Great Plains have been segregated as var. standleyanum (Aellen) Fern.

HAB 5,11 // D 3. **ABU** g10 s8 -1.

1193--Chenopodium glaucum L.

Chenopodiaceae [Amaranthaceae]: *Chenopodium* <Blitum> *glaucum* (var. g.)
In Ky. this diploid ($2n = 18$) is known only from the Ohio Rv. shore in BOON (A. Cusick #24687 at NCU) and the Univ. of Ky. campus in FAYE (KY).

Variation needs further study across ranges. Plants in northeastern North America can mostly be treated as var. *glaucum*, which apparently originated from Eurasia (FNA 4); they are rare to absent in southeastern states (PL). Var. *salinum* (Standl.) Boivin, which has been treated as a species by some authors, may be native in western and northern regions, but is virtually unknown in states east of the Mississippi Rv.

ALI EU? **HAB** R-10,1? ::: E? 6. **ABU** +4?

1194--Chenopodium bonus-henricus L. W

Chenopodiaceae [Amaranthaceae]: *Chenopodium* <Blitum> *bonus-henricus*
This occasionally cultivated tetraploid ($2n = 36$) perennial is locally escaped in northeastern regions, but virtually absent elsewhere in North America (FNA 4, PL). The only record from Ky. is a coll. in DAVI (MUR): Austin & Gentry #3495, 3 Aug 1966, waste pond bank by oil storage tank, 1.2 m W of US 431 on Marksburg Rd., ditch crossing road.

ALI EU.

1195--Dysphania pumilio (R. Br.) Mosyakin & Clemants

Chenopodiaceae [Amaranthaceae]: *Dysphania* [*Chenopodium**] *pumilio*
This Australian weed is widely scattered in North America, especially southeastern and Pacific region (PL).

ALI AU. **HAB** H-10,1? ::: D? 6. **ABU** +4.

1196--Dysphania botrys (L.) Mosyakin & Clemants

Chenopodiaceae [Amaranthaceae]: *Dysphania* [*Chenopodium**] *botrys*
This cosmopolitan weed is widely scattered in North America but rare to absent in southeastern states.

ALI EU. **HAB** H-10,1? ::: D? 6. **ABU** +4.

1197--Dysphania ambrosioides (L.) Mosyakin & Clemants

Chenopodiaceae [Amaranthaceae]: *Dysphania* [*Chenopodium**] *ambrosioides*

This is probably native to warmer regions, but now widespread across North America. It varies much in chromosome number ($2n = 16$ to 64) and several varieties have been proposed, but virtually all plants in Ky. have been referred to typical *ambrosioides*. Separation of var. *anthelminticum* (L.) Gray, with less bracteate spikes, may deserve further study (Y), but there is only one old report from Ky. (Short et al. 1833).

ALI S? **HAB** G-10 ::: D 6. **ABU** +6.

1198--Kochia scoparia (L.) Schrad.

Chenopodiaceae [Amaranthaceae]: *Kochia* [*Bassia*] *scoparia*
This is a widespread variable species native to Eurasia. Plants in North America are generally treated as ssp. *scoparia* (FNA 4). The common cultivar "summer cypress" can be treated as forma *trichophylla* (A. Voss) Stapf ex Schinz & Thellung (apparently = var. *culta* Farw. but not = var. *trichophylla* (Stapf) Bailey). This cultivar is less hairy, have relatively long narrow leaves, and turns bright red in the fall (see also Cr). Clearly escaped plants of this cultivar are known (M) from CAMP (KNK), MASO (sight record) and PIKE (EKY), but they are not included in the map.

ALI EU. **HAB** H-10 ::: D 6. **ABU** +4.

1199--Bassia hyssopifolia (Pallas) Kuntze W

Chenopodiaceae [Amaranthaceae]: *Bassia* *hyssopifolia* (*Kochia* h.)
This Eurasian halophyte is widespread in western North America, but it is only a rare waif in most of the east. There is a coll. from a roadside in CARR (MDKY).

ALI EU. **HAB** R-10? ::: D? 6. **ABU** +4.

1200--Atriplex glabriuscula Edmondston W

Chenopodiaceae [Amaranthaceae]: *Atriplex* *glabriuscula*
This species (with varieties) is a native diploid ($2n = 18$) of coastal regions along the North Atlantic, and it may rarely spread inland. There is a collection from FAYE (KY-Agr.) that appears to represent a waif.

ALI N?

1201--Atriplex patula L.

Chenopodiaceae [Amaranthaceae]: *Atriplex* *patula* (var. p.)
This Eurasian halophyte is widely scattered as a weed across North America, but rare to absent in southeastern states. *A. prostrata* is a closely related diploid ($2n = 18$ versus mostly 36) that may have been confused in some early records.

ALI EU. HAB F-10 :::: E 6. ABU +4.

1202--Atriplex prostrata Bouchér ex DC.

Chenopodiaceae [Amaranthaceae]: *Atriplex prostrata* (hastata; patula var. h.)
This halophyte is widely scattered across North America, including southeastern coastal marshes, but it may just be alien (F, Cr, W; FNA 4).
ALI EU? HAB F-9 :::: E 6. ABU +4.

1203--Suaeda calceoliformis (Hook.) Moq. W

Chenopodiaceae [Amaranthaceae]: *Suaeda calceoliformis* ("depressa")
This halophyte is widespread in western North America, and rarely adventive in eastern states. It has been found along a salted interstate in BOON (KNK), and it may be expected to increase with further saltings.
ALI W. HAB R-9 :::: E 6. ABU +4.

1204--Suaeda maritima (L.) Dumort. W

Chenopodiaceae [Amaranthaceae]: *Suaeda maritima*
This halophyte is widespread across Eurasia, and it may be native along the coast of eastern North America (FNA 4, W). In Ky. it has been found recorded only once, as an apparent waif in a parking lot at the Univ. of Ky. (FAYE).
ALI E.

1205--Salsola collina Pallas

Chenopodiaceae [Amaranthaceae]: *Salsola collina*
This Siberian halophyte is a diploid ($2n = 18$) that has been some confused with *tragus*, which is a closely related tetraploid (FNA 4). *S. collina* is a less problematic weed, and in North America generally rare to absent outside the Great Plains.
ALI AS. HAB R-10? :::: D? 6. ABU +4.

1206--Salsola tragus L.

Chenopodiaceae [Amaranthaceae]: *Salsola tragus* (australis; kali var. tenuifolia)
This noxious "tumbleweed" (or "Russian thistle") is common in drier western and northern regions of North America but relatively infrequent in southeastern states. The earliest report from Ky. was in 1914, when Gm noted: "appeared in a planting of alfalfa from North Dakota seed." There have been few records after 1950.
ALI EU. HAB H-10 :::: D 6. ABU +4<.

1207--Corispermum americanum (Nutt.) Nutt.

Chenopodiaceae [Amaranthaceae]: *Corispermum americanum* ("hyssopifolium")
This is a northern and western species that appears native along the Mississippi Rv., but more eastern records may be adventive (FNA 4). The genus has previously been considered native only in Eurasia (e.g. Cr), and the name *C. hyssopifolium* L. was misapplied to much American material. The only Ky. records are colls. of R. Athey and E.T. Browne (for possible accession at EKY), from sandy banks of the Mississippi Rv. in FULT. These plants have been erroneously reported as var. *rydbergii* Mosyakin or *C. villosum* Rydb. (BA).
ALI n. HAB 1 :::: D? 6. ABU g10 s2? -1?

1208--Monolepis nuttalliana (J.A. Schultes) Greene

Chenopodiaceae [Amaranthaceae]: *Monolepis nuttalliana*
During recent decades, this western species of subalkaline clays has spread to disturbed areas as far east as Ind., Ohio and Ky. (FNA 4; NS; A. Cusick, pers. comm.). It flowers and fruits relatively early for a chenopod, in Apr-May, and it has often been found on compacted soils in fairgrounds and similar sites, before mowing for the annual summer events. The only Ky. record so far is a coll. from a muddy horse show ring at the fairgrounds of OLDH: A. Cusick #36043, 2002 Apr16 (Miami University herbarium).
ALI W. HAB S-10 :::: D? 5. ABU +4?

1209--Achyranthes japonica (Miq.) Nakai

Amaranthaceae: *Achyranthes japonica*
During 1980-2000, this Japanese perennial gradually invaded riparian woods along the Big Sandy Rv. and central Ohio Rv. (Medley et al. 1985, Abbott et al. 2004; PL, W). It has recently been reported from Tenn., Ala. and Ga. (SE; C. Evans at www.rtrcwma.org).

This species is well established at several sites in s. Ind. (M. Homoya, pers. comm.), and it has probably been overlooked in many areas of Ky. near the Ohio Rv. Further documentation is needed in both JEFF (J. Wysor, pers. comm.) and BOON (D. Boone, pers., comm), where extensive patches have been observed in recent years. At the Boone County Cliffs Nature Preserve, *Achyranthes* is even spreading locally onto uplands along some trails.

A. japonica is similar to *Iresine rhizomatosa* in vegetative form, but it lacks stolons and its leaves are usually less broad-based and less long-acuminate. Plants in North America may all be referred to the relatively glabrous var. *hachijoensis* Honda.

ALI AS. HAB 4,1? ::? D? 3? **ABU** +4*.

1210--*Alternanthera philoxeroides* (Mart.) Griseb.

Amaranthaceae: *Alternanthera philoxeroides*

This floating subaquatic weed is becoming a serious invasive problem along shorelines in southeastern states.

ALI SA. HAB 2,1,9 ~:: D? 5. **ABU** +5*.

1211--*Amaranthus blitoides* S. Wats. W

Amaranthaceae: *Amaranthus* <*Albersia*> *blitoides* ("graecizans")

This western species may just be a rare adventive, but there has been some confusion from misuse of the name "graecizans" for both this species and *A. albus*. The only confirmed record is a coll. from BALL (KY): F.T. McFarland #233, 15 Sep 1949, near La Center.

ALI W. HAB H-10 ::: D? 6. **ABU** +4.

1212--*Amaranthus albus* L.

Amaranthaceae: *Amaranthus* <*Albersia*> *albus* ("graecizans")

This is native to North America, but it has become a widespread "tumbleweed" and the original range is uncertain. There has been confusion with the more southwestern *A. blitoides*. Also, the related species, *A. viridis* L. (from South America) and *A. blitum* L. (a pantropical weed), can be expected (FNA 4). Further review of colls. is desirable.

ALI w. HAB H-10 ::: E 6. **ABU** g10 s8 +1?

1213--*Amaranthus spinosus* L.

Amaranthaceae: *Amaranthus spinosus*

This is generally considered to have spread into North America from subtropical or tropical regions to the south (e.g. F, W). But it may have been present early after settlement. The earliest record in Ky. was by Short & Peter (1835). In 1914, Gm noted: "very common everywhere in Kentucky." It is only spiny member of Caryophyllales in Ky., apart from the prickly pear (*Opuntia*). Like some "smartweeds" (*Polygonaceae*), it has "chevrons" on its leaves (pale V-shaped marks--perhaps a warning to herbivores).

ALI S. HAB G-10 ::: E 6. **ABU** g10 s10 +6.

1214--*Amaranthus retroflexus* L.

Amaranthaceae: *Amaranthus retroflexus*

This was originally native in central and eastern North America, but is now a cosmopolitan weed. There has been much confusion between this species and *hybridus*, and there may be some hybridization (FNA 4). Further checking of identifications is needed among these and other congeners; see also *powellii* and *arenicola*. Some keys are difficult to use, especially if distinguishing reportedly monoecious species (including the *retroflexus*-*hybridus* group) from strictly dioecious species (subgenus *Acnida*). It is often impossible to find male florets in fruiting plants of *retroflexus* and *hybridus*; F stated that *Amaranthus* is "monoecious, dioecious or polygamous."

ALI s. HAB H-10 ::: E 6. **ABU** g10 s10 +3?

1215--*Amaranthus powellii* S. Wats.

Amaranthaceae: *Amaranthus powellii* (*retroflexus* var. p.)

This is closely related to *hybridus* (with possible hybrids) and has probably been overlooked in eastern states, where it is adventive from southwestern states and Mexico (FNA 4; W). *A. powellii* differs from *hybridus* in its longer bracts (4-7 mm versus 2-4 mm), and in its inflorescences, which are usually stiff with erect branches (versus usually soft and lax with spreading branches). In Ky. the only record is a coll. from HICK (MUR; Grubbs 1989). *A. powellii* may also hybridize with dioecious taxa in subgenus *Acnida* (FNA 4).

ALI W. HAB h-10? ::: D 6. **ABU** +4?

1216--*Amaranthus hybridus* L.

Amaranthaceae: *Amaranthus hybridus* ("paniculatus")

This is said to have originally been a "riverside pioneer in eastern North America" (FNA 4), but is now a cosmopolitan weed. There has been confusion among *retroflexus* and *powellii*, which have proven to be distinct species; hybrids can occur but are generally sterile. It appears that *retroflexus* became "very common" during the 18th century. *A. hybridus* (as "paniculatus") was "frequent in good ground, but not as common" in 1914 (Gm); now it is the more abundant species.

A. hybridus has generally narrower inflorescence branches than *retroflexus* (and often more reflexed to nodding versus just erect to reflexed at tips), shorter bracts and shorter sepals, which are acuminate to aristate versus obtuse to emarginate (F, FNA 4). Both species can have reddish hues in various plant parts, but these are highly variable characters, even within populations. *A.*

hybridus is reportedly more often reddish in inflorescences (especially bracts), but retroflexus may be more consistently reddish at stem bases.

ALI s? **HAB** H-10 ::: D 6. **ABU** +3?

1217--Amaranthus cruentus L. C

Amaranthaceae: *Amaranthus cruentus* (paniculatus, hybridus ssp. c.)
This is a cultivated ornamental or "pseudocereal" (known as blood, red or purple amaranth) that occasionally escapes, but it does not appear to be persistent. There are records from BOON, FAYE (KY), JESS and PIKE (M). *A. cruentus* originated from hybridus, probably in Central America (FNA 4). The closely related cultivar, *A. caudatus* L. ("loves-lies-bleeding") is a popular ornamental and may also be expected as an occasional escape; its sepals are less acute and its style branches are more reflexed (FNA 4). Both cultivars are closely related to hybridus but differ in their more robust inflorescences, which are usually bright red to purple, and in their relatively large seeds, which are often white to reddish (versus just brown to black in related species).

Another colorful cultivar, *A. hypochondriacus* L. ("Prince's feather") is widely grown in North America, but there are no reliable reports of naturalization. It may be largely derived from *powellii*, and has more stiff, erect inflorescences than *caudatus* or *cruentus* (FNA 4).

ALI S?

1218--Amaranthus caudatus L. C

Amaranthaceae: *Amaranthus caudatus*
See notes under *caudatus*.

ALI SA.

1219--Amaranthus arenicola I.M. Johnston

Amaranthaceae: *Amaranthus* <Acnida> *arenicola* ("torreyi")
This native of the Great Plains appears to be native on sandy banks of the Mississippi Rv. It is close to *palmeri*; identification is difficult and records should be rechecked. In staminate condition, it is also confusable with *tuberculatus* (FNA 4).

ALI w. **HAB** 1 ::: D 6. **ABU** g10 s5? -1?

1220--Amaranthus palmeri S. Wats.

Amaranthaceae: *Amaranthus* <Acnida> *palmeri*

This appears native on or near sandy banks of the Mississippi and lower Ohio Rivers. It was originally native in southwestern regions, but has become widespread elsewhere in North America (FNA 4). See also *arenicola*.

ALI w. **HAB** 1 ::: D 6. **ABU** g10? s5? -1?

1221--Amaranthus rudis Sauer

Amaranthaceae: *Amaranthus* <Acnida> *rudis* ("tamariscinus")
This may just be a western form of *tuberculatus*, originally centered in the Great Plains, and some authors have now combined these species (FNA 4, Y). *A. rudis* sometimes appears transitional from *tuberculatus* to *arenicola* or *palmeri*.

ALI w. **HAB** h-1,10? ::: D 6. **ABU** g10? s6? -1?

1222--Amaranthus tuberculatus (Moq.) Sauer

Amaranthaceae: *Amaranthus* <Acnida> *tuberculatus* (*Ac. altissima*, *subnuda*)
This may have originated in northern regions, from the Ohio Rv. to the Great Lakes, but it is now a widely scattered weed in North America (FNA 4). The mapped records here include var. *subnudus* S. Wats., which is not recognized in recent treatments. See also notes under *rudis*. *A. cannabinus* (L.) J.D. Sauer is a related species of Atlantic coastal marshes that was been reported from Ky. by BA in error (M).

HAB h-10,1? ::: D 6. **ABU** g10? s8? -1?

1223--Celosia argentea L. C

Amaranthaceae: *Celosia argentea*
This is an occasionally escaped ornamental, but perhaps not truly naturalized; there are records from LIVI and PIKE (M). The more showy cultivated plants are known as var. *crinata* (L.) Kuntze.

ALI SA?

1224--Froelichia gracilis (Hook.) Moq.

Amaranthaceae: *Froelichia gracilis*
This midwestern species has increased into eastern states, largely along railroads (FNA 4).

ALI w? **HAB** R-10,1 :: C 6? **ABU** g10 s8? -1?

1225--Froelichia campestris Small

Amaranthaceae: *Froelichia campestris* (*floridana** var. c.)
This midwestern species has sometimes (e.g. FNA 4) been combined with the southeastern *F. floridana* (Nutt.) Moq., but should be recognized at least as a

variety (Cr, W). There has also been some confusion with *gracilis*, and hybrids are possible (FNA 4); further checking of colls. is advisable.

HAB h-1,10? :: C? 6? **ABU** g9? s5? -2?

1226--*Iresine rhizomatosa* Standl.

Amaranthaceae: *Iresine rhizomatosa* ("celosioides")

This largely southeastern species is virtually restricted to thin woods and edges along the banks of larger streams and rivers, often growing into fresh fertile alluvium. It is generally described as a dioecious, paniculate, stoloniferous perennial, but there may be variation in its vegetative form (Y). In Ky. it is the only native, potential perennial of Amaranthaceae.

HAB 4,1 :: D 3. **ABU** g9 s8 -3.

1227--*Nyssa sylvatica* Marsh.

Nyssaceae [Cornaceae]: *Nyssa sylvatica* (var. s.)

This eastern tree is widespread in most regions of Ky., but much less frequent on the more fertile base-rich soils. It was virtually absent in the original woods of the central Bluegrass region (Campbell 1989). Variation needs further study. Some narrow-leaved colls. from CALL may be referred to var. *caroliniana* (Poir) Fern., but that taxon is not recognized in recent treatments. See also notes under *biflora*.

HAB 7,6,11,9 C 2. **ABU** g10 s10 -3.

1228--*Nyssa biflora* Walt.

Nyssaceae [Cornaceae]: *Nyssa biflora* (*sylvatica* var. b.)

This southeastern tree is sometimes treated as a variety of *sylvatica*. It is verified in adjacent w. Tenn. (Ch) and se. Mo. (Y), but there are only a few scattered records from Ky. (M; Clark et al. 2005), mostly with uncertain identification. A fruiting coll. from ROCK (KY; see also Wharton 1945) may be typical *biflora*, but even this has been doubted (Burckhalter 1992). It is possible there is intergradation with typical *sylvatica*.

N. biflora differs from *sylvatica* (F, Cr, W) in its fruiting peduncles usually 1-3 cm long (versus 3-5 cm), with 2 flowers (versus 3-5). Leaves are relatively thick and stiff, usually oblanceolate (versus obovate), with obtuse apex (versus acuminate), usually entire (versus often with a few distal teeth). The trunk is swollen or buttressed at base (not in *sylvatica*); and older bark has vertical furrows (versus vertical and horizontal). Identification is often difficult or impossible with leaves alone.

HAB 6,9,3 C 2. **ABU** g8 s3? -3.

1229--*Nyssa aquatica* L.

Nyssaceae [Cornaceae]: *Nyssa aquatica* (uniflora)

This southeastern tree is known only from sloughs near larger rivers in or near the Mississippian Embayment. Gm's reports from the Mississippian Plateau in TODD and WARR are dubious. However, further south the species is known from other disjunct sites in south-central Tenn. (Ch).

HAB 3,9 ~ C 3. **ABU** g8 s5 -3.

1230--*Cornus alternifolia* L. f.

Cornaceae: *Cornus* <Mesomora> *alternifolia*

In Ky. this eastern species is generally restricted to mesic forested sites, especially ravines with base-rich soils. It is rare to absent in w. Ky. and w. Tenn., but its range does extend as far as s. Ark. and s. Miss. (PL). *C. alternifolia* is sharply distinct from other North American species of *Cornus* in its relatively mesic habitat, clustered alternate leaves, and lower chromosome number (2n = 20 versus 22).

HAB 5 D 1. **ABU** g9 s8 -2.

1231--*Cornus florida* L.

Cornaceae: *Cornus* <Cynoxylon> *florida*

This southeastern species is common in most regions of Ky. It is uncommon to rare in the native woodlands of more fertile agricultural regions, but has become widely planted as an ornamental tree. In the central Bluegrass, Short (1828-9) noted: "In common with the red-bud, white oak and poplar, (tulip tree,) the dog-wood is confined in this country, to the thinner and more broken soils bordering on the Kentucky river and other water-courses, never being found on the first rate lands."

Anthracnose fungus has reduced *Cornus florida* in the Ohio Valley since the 1990s, especially within successional forests where it had prospered before under relatively deep shade (Pierce et al. 2008). Nevertheless many healthy trees remain, especially in more open areas.

HAB 7,11,8,5 C 2. **ABU** g10 s10 -2.

1232--*Cornus amomum* P. Mill.

Cornaceae: *Cornus* <Swida> *amomum* (ssp. a.*)

See notes under *obliqua*, which needs careful distinction. Compared to other eastern species of *Swida* (= *Cornus* subgenus *Kraniopsis*), both *amomum* and *obliqua* have longitudinally splitting bark (versus irregularly platy), relatively

dark brown pith (versus pale brown to white), leaves with a moderate number of lateral veins (usually 4-6 per side), and seeds strongly ridged.

HAB 2,1,9 C 4. **ABU** g9 s8 -3.

1233--*Cornus obliqua* Raf.

Cornaceae: *Cornus* <*Swida*> *obliqua* (purpusii; amomum ssp. o.*/var. schuetzeana)

There has been much confusion with amomum, which appears to intergrade in some regions east of Ky. (Z.E. Murrell in W). Some authors have combined these taxa as varieties or subspecies (e.g. J, Y). Occasional hybrids have also been suspected elsewhere with drummondii or racemosa (Y), but these are not documented in Ky. *C. obliqua* is a largely midwestern species, which generally occurs in Ky. on rocky river banks and cobble bars with rheophytic vegetation. *C. amomum* is a largely southeastern species, which generally occurs in Ky. on more hydric soils along slowly moving streams, river pools, sloughs and ponds. However, both taxa are well-dispersed by birds and can sometimes be found in atypical habitats. Also, *obliqua* has been widely planted (as "silky dogwood") along smaller streams and uplands for so-called "restoration" or other "landscaping" projects.

HAB 1 C 4. **ABU** g9 s9 -1.

1234--*Cornus stolonifera* Michx. C

Cornaceae: *Cornus* <*Swida*> *stolonifera* ("sericea")

In the Ohio Valley, this widespread northern shrub is virtually absent south of the glacial limit, and it does not even extend south along the higher Appalachians (F, W). However, it is often planted in southeastern states (as "red-osier" or "red-twig dogwood") and it may rarely escape. In Ky. there has been some confusion with other species, and old unverified reports of *stolonifera* are dubious (e.g. Gm); see also CW for recent records. The frequent planting of *stolonifera* as a "native" species in Ky. is not justified. There are two old colls., but it is not certain that these were from native plants: H. Garman, 23 Aug 1910, from HENR (KY) with no locality; and M. Wharton #1453 from LINC (check MICH). Some large plants occur at the Avon Army Depot in FAYE (JC for KY), but they may also result from planting.

Distinction from amomum can sometimes be difficult, and introgression is possible; see Z.E. Murrell in W for a modern treatment. Pith of *stolonifera* is usually thick and white (as used by Gl, Cr and others), but this may not be a generally reliable character. Both *stolonifera* and *rugosa* have relatively

smooth green or reddish bark with protruding lenticels, leaves with numerous veins (up to 5-9 per side) and axillary tufts of hairs.

ALI n. **HAB** 2,1,9? C? 4. **ABU** g10 s1? -6?

1235--*Cornus rugosa* Lam. R

Cornaceae: *Cornus* <*Swida*> *rugosa* (circinata)

This northeastern shrub has been reported from Ky. by Pr, Gm and other early authors (M). The only known coll. is from ROWA (MDKY) in the 1930s and has dubious data (Campbell et al. 1992).

1236--*Cornus stricta* Lam.

Cornaceae: *Cornus* <*Swida*> *stricta* (foemina ssp. f.*)

This southeastern species is close to the more northern *racemosa*, but colls. can be clearly distinguished in almost all cases; see Z.E. Murrell & A.S. Weakley (W) for a modern treatment. *C. stricta*, *racemosa* and *drummondii* share leaves with relatively few veins (3-5 per side).

HAB 2,3,9 C? 4. **ABU** g9 s8 -3.

1237--*Cornus racemosa* Lam.

Cornaceae: *Cornus* <*Swida*> *racemosa* (foemina ssp. r.*)

This is a widespread northeastern species of varied habitats, but in Ky. it is known only from a few sites on dry uplands of central regions. It has been confused with *obliqua* or *stricta*, and hybrids may be expected (Y, W). Dubious records due to confusion in nomenclature, possible non-native status or other problems have not been mapped here. The coll. from OHIO (MDKY) has been considered intermediate between *racemosa* and *stricta*. Seedlings of *racemosa* have been widely distributed by Kentucky Division of Forestry, using material propagated from Mo. (T. Sheehan, pers. comm.). The probable native records mapped here indicate that *racemosa* is rare in the state. Other species of *Cornus* should be preferred for general restoration.

HAB 12,10,9,1? C? 4. **ABU** g10 s5 -2.

1238--*Cornus drummondii* C.A. Mey.

Cornaceae: *Cornus* <*Swida*> *drummondii* (priceae, "asperifolia")

This distinctively pubescent species is widespread on base-rich soils from midwestern regions to the Gulf Coastal Plain. In Ky. it is concentrated in the Bluegrass region, on calcareous uplands of the Mississippian Plateaus, and along some western river bottoms. Variation across this range of habitats deserves further study, but may be generally continuous. Introgression can be expected with *obliqua*, *stricta* and other species (Y, W).

The segregate known as *C. priceae* Small from dry sites in w. Ky. and w. Tenn. (Sm, F) has been considered to have smaller fruits (3-4 mm wide versus 5-6 mm) and flowers (petals 2.5-4 mm long versus 4.5-6 mm), more scabrous upper leaf surfaces, and more consistently reddish/maroon twigs (versus green/olive to pinkish/reddish-brown). The type of *priceae* is from WARR (NY), but there has been virtually no application of this name by botanists within Ky.

HAB 8,7,11,4 E 3. **ABU** g9 s9 -3.

1239--*Deutzia scabra* Thunb.

Hydrangeaceae [Saxifragaceae]: *Deutzia scabra*

This popular ornamental shrub has become locally naturalized at Natural Bridge State Park in POWE (KY). Other records come from CW, but details are not yet available.

ALI AS. **HAB** 5,7 D? 4. **ABU** +4.

1240--*Philadelphus hirsutus* Nutt.

Hydrangeaceae [Saxifragaceae]: *Philadelphus* <*Deutzioides*> *hirsutus*

This southern Appalachian shrub is sometimes confused with other species in southeastern states. In addition to its distinctive united styles and non-caudate seeds (Hu 1954-55), *hirsutus* has exposed axillary buds (most clearly in long-shoots), whereas the other species have buds enclosed by the petiolar base (W). Also, its young twigs are hairy (versus glabrous).

HAB 12,11 +\ E 3. **ABU** g8 s7 =.

1241--*Philadelphus inodorus* L. R

Hydrangeaceae [Saxifragaceae]: *Philadelphus inodorus*

This occurs from the mountains of Tenn. and Va. to the Coastal Plain of Ala. and Fla. Although reported as native to Ky. by several authors, most or all records appear based on plants persistent or escaped from cultivation, or on misidentified *intectus*. Hu (1954-55) did not list any wild colls. from Ky., although B had reported a coll. from CUMB (check NY, US), and M reported a coll. of var. *grandiflorus* from PULA (MO) that was annotated by Hu. There are confirmed colls. from FRAN (EKY), JEFF (DHL), LEE (EKY) and SCOT (US), but these are not mapped here since they are almost certainly from plantings or escapes; records from w. Tenn. also result from cultivation (Ch; see APSU).

Compared to other North American species, *inodorus* has more stamens (ca. 60-90 versus 20-50, with 30-40 in *intectus*); larger flowers (petals ca. 15-26 mm long versus 12-15 mm); typically 1-3 flowers per inflorescence (versus 3-9); and silvery reddish-brown outer bark peeling in strips (versus dull greyish, more persistent or cracking into smaller plates in *intectus* and *pubescens*).

1242--*Philadelphus intectus* Beadle ?

Hydrangeaceae [Saxifragaceae]: *Philadelphus* cf. *intectus* (*pubescens* var. i.*) These plants have often been misidentified as *inodorus* in Ky. They generally match Hu's (1954-56) description of *intectus*, except that they typically have 3-7 flowers in each cymule, versus 5-9 in her description. *P. intectus* has been considered a glabrous variety or form of *pubescens*, but Hu revived its status as a species. *P. intectus* may only be known from limestone bluffs near the Cumberland Rv. in Ky. and Tenn. (D. Estes, pers. comm.), transitional in range and morphology between the largely Ozarkian *pubescens* and the southern Appalachian *inodorus*. Colls. from LYON (NY) and other western localities should be rechecked for *P. pubescens* var. *pubigerus* Hu, which may be transitional from *intectus* to *pubescens*.

Based on Hu's work and our local observation, *intectus* differs from *pubescens* in its smaller seeds (embryos ca. 1.25 mm versus 2 mm); smaller capsules (5-7 mm versus 7-9 mm); stigmatic surfaces unequal (adaxial/abaxial ratio ca. 2-3 versus subequal); sepals, hypanthia and pedicels glabrous (versus pubescent); cymules generally with fewer flowers, (1) 3-7 (9) versus 5-9 (11); and leaves generally glabrous on both surfaces except along veins below (versus pubescent along veins above and uniformly below), averaging larger and broader (often suborbicular on vegetative shoots).

HAB 5,11 +\ D 3. **ABU** g5? s5? =.

1243--*Philadelphus pubescens* Loisel.

Hydrangeaceae [Saxifragaceae]: *Philadelphus pubescens* (var. p.*)

This largely Ozarkian species is known from disjunct eastern areas on limestone cliffs, or sometimes sandstone. It has been difficult to determine the alien versus native status of some records, and distinction from the alien *coronarius* is often difficult; see also "cf. *intectus*" for potential taxonomic confusion. Only probable native plants are mapped as certain records. Colls. from CLAR (JC for KY) and JEFF (DHL) should perhaps be excluded since they may be derived from plantings or locally naturalized. However, there are records of native plants adjacent to JEFF in MEAD and HARD (KSNPC database).

HAB 12,11 +\ E 3. **ABU** g10 s4? =.

1244--Philadelphus coronarius L. C

Hydrangeaceae [Saxifragaceae]: *Philadelphus coronarius*

There are colls. of this commonly cultivated species from FLEM, FRAN (EKY), LYON, TRIG (APSU) and elsewhere, but these were probably just persistent plants at old home sites and not truly naturalized. A coll. from SPEN (EK) may be from a wilder context. Some identifications are tentative; it appears that inflorescences may sometimes have only 3 or 4 flowers, not 5-7 as in most descriptions.

ALI EU.

1245--Hydrangea arborescens L.

Hydrangeaceae [Saxifragaceae]: *Hydrangea arborescens* (var. a.)

Typical *arborescens* is a widespread eastern species. See notes under *cinerea*.

HAB 5,4 +\ D 3. **ABU** g10 s10 -1.

1246--Hydrangea cinerea Small T

Hydrangeaceae [Saxifragaceae]: *Hydrangea cinerea* (*arborescens* var. *discolor*, *deamii*)

There have been several reports from Ky. of *H. arborescens* var. *deamii* St. John, also known as ssp. *discolor* (Seringe) McClintock or *H. cinerea* Small. However, colls. that have been given these names seem to be only somewhat hairier forms of *arborescens*, scattered across southern regions of Ky., and they may not deserve recognition. Indeed, colls. cited under these names from across the central Mississippi Valley (in Ark., Mo., Ill., Ind., Ky. and w. Tenn.) are generally less distinct than typical *cinerea*, which occurs in and around the Southern Appalachians (in Ala, Ga., N.C., S.C. and Tenn.), where it is usually restricted to base-rich soils (McClintock 1957; Pilatowski 1982; Cr, W).

Based on McClintock and others, typical *cinerea* has dense felty white pubescence on lower leaf surfaces, while typical *arborescens* is glabrous except for major veins. Leaves of *cinerea* are broadly ovate to orbicular; *arborescens* has similar shape ($l/w = 0.5-1$) or often more narrowly ovate ($l/w = 1.5-3$). Sterile (marginal, radiant) flowers may be more frequent or larger (usually ca. 1-1.3 cm across versus ca. 0.7-1 cm in *arborescens*). But an extraordinary cultivar of *arborescens* from s. Ill. named "Annabelle" has profuse radiant flowers across the whole corymb.]

It remains possible that *cinerea* is transitional from *H. arborescens* to *H. radiata* Walt, which is largely restricted to the southern Blue Ridge escarpments (Ga., N.C., S.C., Tenn.). The only record of *radiata* from Ky. (Pr) might have been based on a *cinerea*-like plant; no coll. has been located.

HAB 5,11 E?

1247--Stewartia ovata (Cav.) Weatherby

Theaceae: *Stewartia ovata*

This small tree occurs mostly in the southern Appalachians and Piedmont, and is especially frequent on the southern Cumberland Plateau (PL, W). Reports from POWE and ROWA have not been verified (Gm; Little 1977; Campbell et al. 1989). Plants in Ky. may all have purple stamen filaments, and propagules have been sought for horticultural use. They have been named var. *grandiflora* (Bean) Weatherby, but most authors have not adopted this division (FNA 8).

HAB 11,5 A 2. **ABU** g8 s7 -1.

1248--Styrax americanus Lam.

Styracaceae: *Styrax americanus*

In Ky. this southeastern shrub is restricted to swampy woods in western regions. A few more densely pubescent colls. from CALL (KY) and OHIO (GH, MO) have been referred to var. *pulverulentus* (Michx.) Perkins. However, that taxon is typical of more southern piney flatwoods, and Ky. plants are probably no more than transitional (W).

HAB 6,9,3 C 4. **ABU** g8 s8 -3.

1249--Styrax grandifolius Ait.

Styracaceae: *Styrax grandifolius*

The only reliable record of this southeastern species is a recent coll. by E.W. Chester from LYON (APSU, EKY; reported by CW). It has been also been reported from WHIT (R. Jacobs, pers. comm.) and perhaps collected elsewhere (Cr, Gonsoulin 1974). However, it cannot be relocated at some sites, where data remain dubious (Palmer-Ball et al. 1988, Chester 1991, M). *S. grandifolius* is known from nearby counties in s. Ill., s. Ind., se. Ohio, w. Va. and across n. Tenn. (K, PL).

Compared to *americanus*, plant dimensions in *grandiflorus* are generally greater (FNA 8), especially the flowers, with corolla lobes 15-22 mm versus 10-12 mm. Also, leaves are relatively broad (l/w ca. 0.7-0.8 versus 0.5) and

hairier beneath (densely fine pale pubescent versus glabrous to dense rusty);
2n = 32 versus 16.

HAB 11,5,7? C? 3? **ABU** g8 s2 -2?

1250--Halesia tetraptera Ellis

Styracaceae: *Halesia tetraptera* ("carolina")

This southeastern tree is most frequent in southern Appalachian regions, but there are scattered populations in mesic sites across southeastern states. There is a remarkable narrow extension on slopes and terraces along the Tennessee Rv. down to its mouth in Ky. (K). Records from Appalachian regions of Ky. are old.

The record from LAWR is an 1830s coll. of C.W. Short (with locality "Louisa" at Univ. of Tex.). Presumed colls. from HARL (B: Big Black Mt., "mesophytic north face woods, rare") and MCRE (Little 1971) have not been relocated. See also M and Chester (1991) for review of old, obscure or misleading records.

Var. *monticola* (Rehd.) Reveal & Seldin may be a reasonable segregate at higher elevation in the southern Appalachians (W), and might be expected in Ky. *H. carolina* L., sensu stricto, is largely restricted to the Coastal Plain and Piedmont (K, W); but it has been combined with *tetraptera* by some authors (e.g. FNA 8). Reports of *carolina* from Ky. are based on the latter approach.

HAB 5,4 C 2. **ABU** g9 s5? -2.

1251--Galax urceolata (Poir.) Brummitt

Diapensiaceae: *Galax urceolata* ("aphylla")

This largely southern Appalachian genus is generally considered monotypic, but two chromosome races exist. All plants in Ky. are probably diploids (2n = 12, not 6 as reported in FNA 8); tetraploids occur in the Blue Ridge and further east (Nesom 1983). The latter have distinctly larger overall plant size, larger stomatal guard cell size, distinctive flavonoids, and they probably do not hybridize to a significant degree. However, taxonomic recognition is not generally supported (W).

A curious character of *Galax* is the distinctive musky odor that emanates from leaves of living plants, especially on warm days (Andrews 1915). A secondary mystery is if, or how, this plant led to the commercial perfume component, Galaxolide, which became widely synthesized after 1965. There does not seem to be any regular literature connecting the plant and the chemical. A more established use is "galax pulling" of leaves for use by

florists: "It is estimated that up to 2 billion leaves are harvested annually with a value of over \$20 million to local collectors along the Blue Ridge escarpment" (Bir 2005, W).

The congeneric species, *Shortia galactifolia* Torr. & Gray, is endemic to the southern Blue Ridge, but small patches have been established from transplants, including behind the lodge at Natural Bridge State Park in Ky. (POWE).

HAB 5,11 A 1. **ABU** g8 s7 -1.

1252--Clethra acuminata Michx.

Clethraceae [Ericaceae]: *Clethra acuminata*

This large shrub is restricted to central and southern Appalachian regions. The recent FNA 8 erroneously omitted Ky. and Va. from its mapped range; see K for a more detailed map. The more southern species, *C. alnifolia* L., has been reported but probably in error (as cited by M); in Tenn., it is known only from one southern county (Ch).

HAB 5,7 A 2. **ABU** g8 s8 -1.

1253--Rhododendron maximum L.

Ericaceae <Ericoideae>: *Rhododendron maximum*

This large colonial shrub occurs mostly in or near Appalachian regions of eastern states, and is restricted to acid soils. Disjunct western colls. from parks in CUMB (KY) and EDMO (DHL) may well be from cultivated plants but cannot be completely discounted. There is also an anomalous report from TAYL (Gm).

HAB 5,7,11,6 A 2. **ABU** g9 s8 -1.

1254--Rhododendron catawbiense Michx.

Ericaceae <Ericoideae>: *Rhododendron catawbiense*

In Ky. this southern Appalachian shrub is known only from sandstone clifftops in the Cumberland Mts., and along the southern Cliff Section in MCRE. Reports from POWE and WOLF have been dubious (M, Campbell et al. 1989).

HAB 5,11 A 3. **ABU** g8 s7 =.

1255--Rhododendron minus Michx. R

Ericaceae <Ericoideae>: *Rhododendron minus* (carolinianum)

This shrub is largely restricted to rocky summits in the Blue Ridge and Piedmont regions (PL, W), and it may not be native to Ky. The only known

wild-looking plants are in small patches at forest edges along roads or trails, all in or near parks. There are colls. from BELL (KY, MUR, RC) on Pine Mt. in or near the state park, and on Cumberland Mt. near the Hensley Settlement. There has also been some local transplanting for display in or near these parks. The WHIT (EK, MM) plants appear native, but they are along Ky. State Rt. 92 close to the entrance to Cumberland Falls State Park. See also notes under *Leiophyllum buxifolium*.

HAB 11,12? A 3. **ABU** g6 s2? -1?

1256--*Rhododendron arborescens* (Pursh) Torr.

Ericaceae <Ericoideae>: *Rhododendron* <Pentanthaera> *arborescens*
This large shrub occurs mostly in the central and southern Appalachians, and within Ky. it is largely restricted to rocky banks along larger streams in the upper Cumberland Rv. watershed. In addition to its distinctive late white flowers with long sepals (Cr, J, W), *arborescens* is glabrous in virtually all parts, and non-colonial with stems up to 5-6 m tall. Other "azaleas" (sect. *Pentanthaera*) of Ky. reach only 1-4 (5) m.

HAB 1 B 4. **ABU** g8 s7 =.

1257--*Rhododendron canescens* (Michx.) Sweet

Ericaceae <Ericoideae>: *Rhododendron* <Pentanthaera> *canescens*
In Ky. this southeastern shrub is known only from seeping toe-slopes in transitions to the floodplain of the Blood Rv. in CALL. There has been some confusion with *prinophyllum*, and the northern extent of *canescens* may remain somewhat uncertain (K, PL, W). In addition to its relatively short corolla lobes (compared to tubes) and often shorter pedicels, *canescens* differs in its generally non-glandular condition and its less conspicuously ciliate leaves (Cr, FNA 8, W). In contrast to *periclymenoides*, both species have relatively elongated capsules, are sparsely to densely hairy in general (versus glabrous to sparsely), and can become relatively large, with usually non-colonial stems up to 4-5 m tall; hybrids are known (FNA 8).

HAB 6 B 3. **ABU** g8 s2 -2.

1258--*Rhododendron prinophyllum* (Small) Millais

Ericaceae <Ericoideae>: *Rhododendron* <Pentanthaera> *prinophyllum* ("roseum")
This shrub occurs mostly in dry woods of Ozarkian and Appalachian regions, but the range is fragmented and disjunct populations are scattered across southeastern states. It may be expected in w. Ky., since it is known from s. Ill. (ML), but reports from c. Tenn. have been erroneous (K, Ch). There has been

some confusion with *canescens*, which Gm reported from GRNP but probably based on *prinophyllum*.

HAB 11,7 A 3. **ABU** g8 s8 -1.

1259--*Rhododendron periclymenoides* (Michx.) Shinnery

Ericaceae <Ericoideae>: *Rhododendron* <Pentanthaera> *periclymenoides* (*nudiflorum*)

This is a largely Appalachian shrub, restricted to acid infertile soils but ranging from subhydric to subxeric sites. Reports from Ky. of the related species, *R. viscosum* (L.) Torr., remain unverified and dubious (Defries 1884b, Gm; see notes in M). That species occurs mostly in Atlantic states, but it is also known from e. Tenn., e. Va., s. W.Va. and perhaps Ohio (Ch, HFG, K, W).

HAB 7,11,6,1 B 3. **ABU** g8 s8 -1.

1260--*Rhododendron cumberlandense* E.L. Braun

Ericaceae <Ericoideae>: *Rhododendron* <Pentanthaera> *cumberlandense* ("bakeri")

This southern Appalachian shrub is variable, and there has been some confusion with *calendulaceum*, which has a more widespread Appalachian range (Cr, FNA 8, W). *R. cumberlandense* differs in its usually smaller, more reddish flowers (versus strictly orange); usually later flowering in June, after leaves have expanded (versus May, with leaf expansion); usually smaller, blunter, less hairy leaves, which tend to dry with a blackish hue; and usually shorter stature, with more rhizome development; $2n = 26$ as in most of the genus (versus 52). In Ky. it tends to occur on damper soils, sometimes even along streamhead seeps, but there is much overlap of habitat. The coll. from BOYL (KY) is notable for its disjunction and historical interest: H. Garman, 19 Jun 1892, Junction City. Gm's unverified report of *calendulaceum* from ADAI is also intriguing.

HAB 7,6 B 3. **ABU** g8 s8 -1.

1261--*Rhododendron calendulaceum* (Michx.) Torr.

Ericaceae <Ericoideae>: *Rhododendron* <Pentanthaera> *calendulaceum*
In Ky. this shrub is restricted to dry acid soils of Appalachian regions (K, W). See notes under *cumberlandense*, which has been confused. Both species have yellowish to red "xanthic" flowers of varied hue (versus pinkish red in other Ky. azaleas), which smell acrid (versus musky or spicy). *R. calendulaceum* is considered to be an allotetraploid derived from ancestors of *cumberlandense* and *prinophyllum* (FNA 8).

HAB 11,7 B 4. **ABU** g8 s8 -1.

1262--*Kalmia latifolia* L.

Ericaceae <Ericoideae>: *Kalmia latifolia*

This colonial shrub occurs mostly in Appalachian regions, but has somewhat disjunct populations elsewhere in southeastern states. Some outlying western records in Ky. deserve further verification, especially in the Bluegrass region. The coll. from TRIM (KY) might be from a planting, stating just "roadside 3 miles NE of Bedford."

HAB 11,7 A 2. **ABU** g9 s9 -1.

1263--*Leiophyllum buxifolium* (Berg.) Ell. R

Ericaceae <Ericoideae>: *Leiophyllum* [*Kalmia*] *buxifolium*

The only record of this southern Appalachian small shrub is an old coll. from WHIT (KY): B.B. McInteer, 14 Oct 1939, Cumberland Falls, within Park by left of road going west about 100-200 yds from park entrance; "a single individual of this species was discovered... growing on a dry sandy bank" (McInteer 1940). It is possible that this plant was introduced along with establishment of the park in 1931. See also notes under *Rhododendron minus*, which still grows nearby along the road.

HAB 12? +\ A 4. **ABU** g6 s0? -6?

1264--*Eubotrys recurva* (Buckl.) Britt.

Ericaceae <Vaccinioideae>: *Eubotrys* [*Leucothoe**] *recurva*

In Ky. this small shrub of southern Appalachian regions is known only from the Bad Branch area on Pine Mt. in LETC (EKY, MDKY), and from nearby in HARL (KSNPC database).

HAB 11,5,1 A 3. **ABU** g9 s2 -1?

1265--*Eubotrys racemosa* (L.) Nutt. R

Ericaceae <Vaccinioideae>: *Eubotrys* [*Leucothoe**] *racemosa*

This small shrub occurs mostly on the southeastern Coastal Plain, and its occurrence in Ky. remains dubious. *E. racemosa* (as "Andromeda") was reported from the state by McMurtrie (1819), and is known from adjacent counties in e. Tenn.

1266--*Leucothoe fontanesiana* (Steud.) Sleumer

Ericaceae <Vaccinioideae>: *Leucothoe fontanesiana* (editorum, axillaris var. e.)

The native range of this small shrub is centered on the southern Blue Ridge, extending west to the Cumberland Plateau and Cumberland Mts. and east to the Piedmont (Ch, PL, W). It is known from several counties adjacent to Ky. in e. Tenn. and w. Va. (K, PL). *L. fontanesiana* was recently discovered in HARL and MADI by Abbott et al. (2001; BERE). However, it is likely that plants in MADI were persistent from old plantings (CW; D. Taylor, pers. comm.).

ALI s. **HAB** 5,7 A 2. **ABU** g7 s2 -1?

1267--*Lyonia ligustrina* (L.) DC.

Ericaceae <Vaccinioideae>: *Lyonia* <*Xolisma*> *ligustrina*

Variation in this southeastern shrub needs further attention. Some relatively glabrous plants in Ky. (see B, M and citations) have suggested var. *foliosiflora* (Michx.) Fern., including the synonymous var. *capreifolia* (Wats.) DC. and var. *salicifolia* (Wats.) DC. However, that taxon of the Coastal Plain is distinguished mostly by its conspicuous bracts, and probably does not occur in Ky. (FNA 8, W).

HAB 6,1,9 A 4. **ABU** g8 s8 -3.

1268--*Oxydendrum arboreum* (L.) DC.

Ericaceae <Vaccinioideae>: *Oxydendrum arboreum*

This tree is widespread across southeastern states, but restricted to acid soils. In Ky. there are no verified records from within the Bluegrass: colls. from JEFF and OLDH (DHL) come from acid shales fringing this region; Gm's report from CAMP seems dubious.

HAB 7,11,5 A 2. **ABU** g9 s9 -2.

1269--*Epigaea repens* L.

Ericaceae <Vaccinioideae>: *Epigaea repens*

This creeping subshrub is widespread across eastern North America, but only east of the Mississippi Rv., and it is largely absent from the Ohio Valley west of the Appalachians (K). It is largely restricted to dry infertile acid soils. Gm's unverified reports from several western Ky. counties may be dubious, and they are mapped here as open dots; but see also *Oxydendrum arboreum*, *Vaccinium stamineum* and *Quercus coccinea*. In the Shawnee Hills, *Epigaea* is verified from CHRI (EKY) and two counties of s. Ind. (D, PL).

HAB 11,12 A 3. **ABU** g9 s8 -1.

1270--*Gaultheria procumbens* L.

Ericaceae <Vaccinioideae>: *Gaultheria procumbens*

This erect subshrub occurs mostly in northeastern and Appalachian regions. Some disjunct western records in Ky. deserve further verification. There is a coll. from ANDE (EKY): M. Wharton #9612, 13 Oct 1955, "mesophytic woods" [but with no other data]. There is a report from EDMO (L. McKinney et al., pers. comm.; see also CW). There may be a coll. from MUHL (MM for WKY) or adjacent counties with native *Pinus strobus*.

HAB 7,11,12 A 2. **ABU** g10 s9 -1.

1271--*Gaylussacia baccata* (Wangenh.) K. Koch

Ericaceae <Vaccinioideae>: *Gaylussacia* <Decamerium> *baccata*

This small shrub is a widespread northeastern and Appalachian species, with extensions into adjacent regions on sandy soils. In older literature, there was some confusion with other species (M). Variation within the "baccata group" (sect. *Decamerium*) can be somewhat subtle, with vegetative characters often most useful (FNA 8, W). However, hybridization is not known to play a significant role.

HAB 11,12,7,10 A 3. **ABU** g10 s9 -1.

1272--*Gaylussacia frondosa* (L.) Torr. & Gray R

Ericaceae <Vaccinioideae>: *Gaylussacia* <Decamerium> *frondosa*

This small shrub occurs mostly in coastal regions of mid-Atlantic states, but it extends inland to some Appalachianian Mts., including the Ridge and Valley region of w. Va. (FNA 8, K, W). There are several old reports from Ky., starting with Gray (1889) and Pr, which might be based on colls. to be located at GH or elsewhere (M).

The related species, *Gaylussacia ursina* (M.A. Curtis) T. & G. ex Gray, is probably restricted to the southern Appalachians south of the Asheville Basin (W). It was reported from Ky. by Kearney (1893) and others, based apparently on T.H. Kearney #550 from Pine Mt. in BELL, but that coll. was redet. as *Lyonia ligustrina* by Fernald (M). *G. ursina* has also been reported recently from Cumberland Gap National Park in BELL (M. Pyne, pers. comm. to KSNPC). Further work may be needed to clarify the taxonomic and geographic limits of species within the "baccata group" (sect. *Decamerium*).

1273--*Gaylussacia dumosa* (Andr.) T. & G. R

Ericaceae <Vaccinioideae>: *Gaylussacia* <*Gaylussacia*> *dumosa*

This subshrub occurs mostly on the Atlantic and southeastern Coastal Plain, but it also extends into s. Tenn. and s. W.Va. (Ch, PL, W). It was reported from WARR by Pr, but no coll. has been located.

1274--*Gaylussacia brachycera* Michx.

Ericaceae <Vaccinioideae>: *Gaylussacia* <*Vitis-idaea*> *brachycera*

This low clonal shrub is locally abundant on the Cumberland Plateau of Ky. and Tenn., with hundreds of sites. Elsewhere, it is known in the central Appalachians from Pa., W.Va. (SC) and Va., the Piedmont of N.C., and the Coastal Plain of Md. & Del., with a total of only 100-200 sites (State Natural Heritage Systems). The species should perhaps be treated in a new monotypic genus; the name *Buxella* was used by Sm but it is an invalid homonym (FNA 8, W).

HAB 11,12 A 2. **ABU** g7 s7 =.

1275--*Vaccinium arboreum* Marsh.

Ericaceae <Vaccinioideae>: *Vaccinium* <*Batodendron*> *arboreum*

This large shrub ranges widely over warmer regions of southeastern states, usually growing in hills on dry acid soils. In Ky. it is virtually unknown north of the southern Knobs, Mississippian Plateaus and the southern Cumberland Plateau.

HAB 12,11,7 A 3. **ABU** g9 s9 -1.

1276--*Vaccinium stamineum* L.

Ericaceae <Vaccinioideae>: *Vaccinium* <*Polycodium*> *stamineum*

This small shrub is widespread in eastern states but generally absent on base-rich soils. In the Bluegrass region, the few records are from old high terraces, riverine or glacial. Lower leaf surfaces in the species are hairy or smooth (as in "neglectum"), but that character is probably not relevant (FNA 8, W). Many plants in Ky. match var. *neglectum* (Small) Deam or other varieties, as defined in previous treatments (e.g. F), but further study is needed with reference to recent revision. The widespread group of plants in east-central states with whitish-glaucous leaves (which would include most or all Ky. material), should probably be placed in a new variety, including *Polycodium candicans* Small; see notes of W.

HAB 11,7 A 2. **ABU** g10 s10 -2.

1277--*Vaccinium erythrocarpum* Michx.

Ericaceae <Vaccinioideae>: *Vaccinium* <*Oxycoccoides*> *erythrocarpum*

This southern Appalachian species has been recently discovered in HARK (EKY), on Black Mountain at ca. 3000 ft elevation, by R. Jones (Naczi et al. 2002). It is also known from within a few miles of the state line in Scott Co., Tenn. (Ch; M. Pyne, pers. comm.).

HAB 11,7 A 3. **ABU** g8 s2 =.

1278--*Vaccinium fuscatum* Ait.

Ericaceae <Vaccinioideae>: *Vaccinium* <Cyanococcus> *fuscatum* (atrococcus)

This shrub is widespread on damp sites across southeastern and Atlantic states, plus disjunct populations on the south side of the Great Lakes (K). It is closely related to the more widespread species, *corymbosum*, which tends to occur on drier sites, and these taxa have been combined by some authors (FNA 8). Intergradation is expected in western regions of Ky., and uncertain records mapped with open dots under *corymbosum* need to be reassessed. *V. fuscatum* differs in its black berries (versus blue); leaves pubescent below, typically with "dingy" brownish hairs (versus glabrous or thinly pubescent with whitish hairs); buds and twigs with brown to blackish hue (versus flesh to reddish).

HAB 6,8? B 3. **ABU** g8? s4? -1.

1279--*Vaccinium corymbosum* L.

Ericaceae <Vaccinioideae>: *Vaccinium* <Cyanococcus> *corymbosum* ("simulatum"; "constablaei")

This shrub is widespread on acid soils in much of eastern North America, but it is largely absent in the midwest. Variation and hybridization in this species and its close relatives needs further study; see notes under *fuscatum* (a relatively distinct diploid with $2n = 24$), *simulatum* (a tetraploid) and *constablaei* (a hexaploid). These and other segregates have been recognized in some treatments (Soltis et al. 2008; W) but lumped in others (FNA 8). In Ky. most or all wild plants are probably tetraploids. These "highbush" blueberries are generally taller than the rhizomatous "lowbush" group: up to (1) 2-3 (7) m versus no more than 0.5-1 m. They lack rhizomes but can shoot from running roots in some cases (see literature cited by W). Cultivars are becoming widely grown for blueberry production, and could escape in the future on suitable soils (Y).

HAB 7,11,6 B 3. **ABU** g10 s9 -2.

1280--*Vaccinium simulatum* Small T

Ericaceae <Vaccinioideae>: *Vaccinium* <Cyanococcus> *simulatum*

This is a tetraploid ($2n = 48$) member of the *corymbosum* complex occurs at moderate to high elevation in the southern Appalachian regions. Distinction is often difficult (W) and there has been much confusion in Ky. (M). Compared to typical *corymbosum*, *simulatum* is reported to have narrower leaves, widest

below the middle (versus at or above), acuminate (versus acute to short-acuminate), and serrulate (versus entire); berries are purple-black when fresh (versus blue with glaucous bloom). In Ky. colls. from BELL (GH), HARL (GH, NY), LETC (US) and elsewhere (Wharton 1945; B, M) have been identified as *simulatum*, but these do not appear clearly distinct based on initial examination. *V. simulatum* has also been determined from several sites in s. Ohio (K, PL).

1281--*Vaccinium constablaei* Gray T

Ericaceae <Vaccinioideae>: *Vaccinium* <Cyanococcus> *constablaei*

This southern Appalachian taxon may be a hexaploid derived from hybridization of *V. simulatum* and *V. altomontanum* Ashe (a lowbush blueberry from higher altitudes). The only Ky. records of *constablaei* are colls. of B from CLIN, ELLI and PULA (perhaps at US); these need to be rechecked. Soltis et al. (2008) did map the range of such hexaploids close to se. Ky.

1282--*Vaccinium pallidum* Ait.

Ericaceae <Vaccinioideae>: *Vaccinium* <Cyanococcus> *pallidum* (*vacillans*) Although segregates have been recognized in the past (especially *V. vacillans* Torr.), this widespread species of east-central states has not been subdivided in recent treatments (FNA 8, W). Distinct but closely related species in this rhizomatous "lowbush" group of blueberries are known to the north, east and south of Ky. Some have occasionally been misidentified in the state, but none are verified (M): *V. altomontanum* Ashe, *V. angustifolium* Ait. and *V. myrtilloides* Michx. The more distantly related, creeping subshrub, *V. crassifolium* Andr. also appears to have been reported in error (BA).

HAB 11,12,7,10 B 2. **ABU** g10 s10 -2.

1283--*Chimaphila umbellata* (L.) W. Bart. var. *cisatlantica* Blake R

Pyrolaceae [Ericaceae]: *Chimaphila umbellata* var. *cisatlantica*

This northern (circumboreal) subshrub has been reported from Ky. in POWE and RUSS, but not verified (Campbell et al. 1989; and Gibson 1971). It is known from the Blue Ridge region, adjacent Piedmont and eastern Coastal Plain (W).

1284--*Chimaphila maculata* (L.) Pursh

Pyrolaceae [Ericaceae]: *Chimaphila maculata*

This subshrub occurs in much of eastern North America, but it is concentrated in or near Appalachian regions. There a relatively abrupt western edge to its

range in the central and lower Ohio Valley, with only local extensions and disjunctions north to the Great Lakes region (PL).

HAB 7,11 :: B 3. **ABU** g10 s10 -2.

1285--*Orthilia secunda* (L.) House R

Pyrolaceae [Ericaceae]: *Orthilia* [Pyrola] *secunda*

This is a northern (circumboreal) rhizomatous herb that extends south to N.J., Pa., Md. and Ind. There is a coll. reportedly from LAWR (NY): J.H. Christ #9782, 8 Sep 1938; "Blaine, on Trail Creek divide, east of Ketchum, under spruces." This curious record needs to be checked; the note "under spruces" suggests a labelling error or cultivated status.

1286--*Pyrola americana* Sweet

Pyrolaceae [Ericaceae]: *Pyrola americana* (*rotundifolia* var. a.)

This northeastern rhizomatous herb extends south into several counties of se. Ohio, s. W.Va. and e. Va., within 10-50 miles of the Ky. line. The only verified Ky. record is a coll. by B in HARL (US) during the 1930s: "rare, oak-chestnut forest of higher ridges of Black Mountain." This population has not been relocated. There is also a somewhat dubious report from POWE (Campbell et al. 1989).

HAB 11,5 A 2. **ABU** g10 s1 -4?

1287--*Monotropa uniflora* L.

Monotropaceae [Ericaceae]: *Monotropa uniflora*

This mycotrophic herb is widespread in moist temperate or montane regions across the Northern Hemisphere, except in Europe. An initial molecular investigation has indicated that segregates may well be warranted (Neyland & Hennigan 2004).

HAB 5,7 C 1. **ABU** g10 s9 -2.

1288--*Hypopitys monotropa* Crantz

Monotropaceae [Ericaceae]: *Hypopitys* [*Monotropa**] *monotropa* (M. *hypopitys**)

This mycotrophic herb is widely scattered across the Northern Hemisphere, but North American plants may deserve distinction as *H. americanus* (DC.) Small. The spelling "hypopithys" is incorrect at either genus or species level; see Y and W for taxonomic review.

HAB 7,11 B 1. **ABU** g10 s8 -2.

1289--*Monotropis odorata* Schwein. ex Ell.

Monotropaceae [Ericaceae]: *Monotropis odorata*

In Ky. this largely southern Appalachian mycotrophic herb is known only from a few sites on dry sandstone ridges and slopes in pine-oak woods.

Flowers usually appear in March or April, but occasionally as early as late January (D. Dourson and A. Risk, pers. comm.) or even October (D. Boone and M. Klooster, pers. comm.; see also notes in W). The powerful spicy smell of its flowers have sometimes aided in discovery by botanists.

HAB 11,5 A 2. **ABU** g6 s5 -2?

1290--*Diospyros virginiana* L. var. *virginiana*

Ebenaceae: *Diospyros virginiana* var. v.

This tree is widespread in eastern states but generally uncommon to absent on fertile base-rich soils. Further study of variation is needed to distinguish var. *pubescens*; see notes under that name.

HAB 8,7,6,11 C 4. **ABU** g10 s10 -1.

1291--*Diospyros virginiana* L. var. *pubescens* (Pursh) Dippel

Ebenaceae: *Diospyros virginiana* var. *pubescens*

Mapping here is provisional. Var. *pubescens* is recognizable mostly along the Mississippi and further west (Cr, W), where it is most distinct in wetlands (D. Estes, pers. comm.). It may be associated with the higher chromosome number ($2n = 90$ versus 60) that has been shown in this species (Baldwin & Culp 1941, Raymond 2006). However, variation often appears to be more complex or continuous, perhaps involving past hybridization with *D. texana* Scheele ($2n = 30$) to the southwest; more analysis is needed (Y, FNA 8). The leaves of var. *pubescens* are thinly but persistently covered with relatively long hairs below (versus glabrous or glabrescent), subcordate (versus cuneate to rounded) and often relatively large; also, twigs are hirsutulous (versus glabrous).

Another potential segregate, var. *platycarpa* Sarg., has been included under *pubescens*, as "an early ripening extreme with depressed fruits up to 7.5 cm across" (F) that is known from west of the Mississippi. In w. and s. Ky., relatively large fruits (ca. 3-5 cm across) are sometimes encountered, but never as large as reported for var. *platycarpa*.

HAB 6,7,8? C 4. **ABU** g9? s7? -2.

1292--*Sideroxylon lanuginosum* Michx. ssp. *oblongifolium* (Nutt.) T.D. Pennington R

Sapotaceae: *Sideroxylon* (*Bumelia*) *lanuginosum* ssp. *oblongifolium*

This species has a more southern (ssp. *lanuginosum*) and western (ssp. *oblongifolium*) range, compared to *lycioides*, but overlapping (FNA 8, K). It may be more concentrated in relatively mesic habitats, where ranges overlap (W). *S. lanuginosum* differs in having persistently hairy twigs and leaves (versus more or less glabrate), and smaller fruits (ca. 6-8 mm long versus 10-15 mm). Ssp. *oblongifolia* occurs widely in the lower Mississippi watershed, but has not been verified in Ky. or Tenn. (Ch, K). It was reportedly collected ca. 1979 by R. Hannan & L. Phillippe (KSNPC) at Floyd's Woods in MCLE, but the plant has not been relocated in herbarium or field (M).

Early records of the largely maritime southeastern species, *S. tenax* L., might have been based on *lanuginosa* (M). There has been some confusion among these and other taxa, especially in regions of overlap, and hybridization is suspected; see keys and notes in FNA 8, Y and W.

1293--*Sideroxylon lycioides* L.

Sapotaceae: *Sideroxylon* (*Bumelia*) *lycioides*

This southeastern small tree is generally restricted to base-rich soils, but in a wide range of habitats from swamp margins to rocky bluffs (W). In Ky. it is most common on subxeric to xeric sites, but can also occur on damper sites. See notes under *lanuginosum*.

HAB 12,11,7,10 E 4. **ABU** g8? s7 -3.

1294--*Dodecatheon amethystinum* (Fassett) Fassett R

Primulaceae: *Dodecatheon* [*Primula*] *amethystinum* (?*radicatum*)

This is known mostly from the "Driftless Area" of sw. Wisc. and adjacent states, but there are also scattered reports from Mo., Ky., W.Va. and Pa. (F, Cr, PL). Records from W.Va. are based on *meadia*, according to FNA 8. The only potential Ky. record is a coll. at GH with little data: Lesquereaux s.n., "Kentucky near the Ohio River"; det. N.C. Fassett (F, M). The identity and context of that coll. needs further study. Distinction of *amethystinum* from *frenchii* and *meadia* has been based simply on its capsules, which have thinner walls when fully mature ("pliable" versus "rigid"), and tend to be lighter reddish brown to yellowish (versus dark reddish brown). It is restricted to relatively mesic sites, usually below calcareous cliffs.

1295--*Dodecatheon frenchii* (Vasey) Rydb.

Primulaceae: *Dodecatheon* [*Primula*] *frenchii* (*meadia* var. *f.*)

This is restricted to ledges below sandstone cliffs in east-central states, mostly in the Ozarks and Shawnee Hills. See notes under *meadia*.

HAB 5,11 // B 3. **ABU** g6 s5 =.

1296--*Dodecatheon meadia* L.

Primulaceae: *Dodecatheon* [*Primula*] *meadia* (var. *m.*)

This is widespread in woods across east-central states on base-rich soils. In Ky. it is virtually unknown from more rugged Appalachian hills, except for a coll. of L. Garrison from LESL (EKY). Fruiting plants are sometimes heavily browsed by deer; an extensive but much browsed population in ANDE has generally failed to reproduce for over 20 years (LC of ANDE, pers. comm.). *D. meadia* is closely related to other North American species of this genus, but relatively robust in several dimensions; also $2n = 88$ (versus 44). There is recent cladistic support for including *Dodecatheon* within *Primula* (Mast & Reveal 2007; FNA 8, W), though the latter has a distinct series of chromosome numbers within North America ($2n = 18, 54, 72$).

HAB 11,5,12,7 +\ E 3. **ABU** g10 s9 -2.

1297--*Hottonia inflata* Ell.

Primulaceae: *Hottonia inflata*

This floating aquatic occurs widely but sporadically on the coastal plain and nearby wetlands from Me. to Tex., with a curious gap in most of S.C., Ga. and Fla. (K, W). In Ky. records for BATH and JEFF date from the 1830s (Campbell et al. 1992; M), but the species is still locally frequent in more extensive western wetlands.

HAB 2 ~ C? 6. **ABU** g8 s6 -4.

1298--*Centunculus minimus* L.

Myrsinaceae [*Primulaceae**]: *Centunculus* [*Anagallis*] *minimus*

This is a cosmopolitan ephemeral annual of seasonally damp bare soil in warmer temperate regions; $2n = 24$. Generic placement remains uncertain; the name *Anagallis minima* (L.) E.H. Krause may be preferred (FNA 8, W). It has rarely been recorded in Ky., but probably often overlooked. It was collected by C.W. Short (PH) but he labelled it *Peplis americana* (= *Elatine* a.): "common around Greenville [MUHL], in thin, poor soils, June 1, 1840"; "common in the poor lands and pastures of Muhlenberg county" (Short 1840). In recent years, there has been a coll. of R. Thompson from MADI (BEREA) from a ditch along Interstate 75 at the KY 21 exit (Abbott et al. 2001); and a coll. of D. Boone from the old road into Eastview Barrens in HARD (for NKY).

HAB R-9,2 ::: C? 6. **ABU** g10 s2? -3?

1299--*Anagallis arvensis* L. var. *arvensis*

Myrsinaceae [Primulaceae*]: *Anagallis arvensis* var. a.

This is a widespread weedy species in temperate regions, but with little consistent differentiation of segregates; $2n = 40$. See notes under var. *caerulea*.

ALI EU. **HAB** S-10 :::: D 6. **ABU** +4.

1300--*Anagallis arvensis* L. var. *caerulea* (Schreb.) Gren. & Godr.

Myrsinaceae [Primulaceae*]: *Anagallis arvensis* var. *caerulea* ("ssp. *foemina*"*)

This segregate of *arvensis* has been treated as a forma, variety, subspecies, or distinct species, and its status still seems uncertain (FNA 8). It is occasionally scattered with the typical plants in Ky. but much less common, and perhaps concentrated on the most fertile soils.

ALI EU. **HAB** S-10 :::: E 6. **ABU** +4.

1301--*Lysimachia clethroides* Duby

Myrsinaceae [Primulaceae*]: *Lysimachia* (Palladia) *clethroides*

This tall white-spiked herb is known only from an old field in MCRA (R. Athey #1929, WKY, EKY). It is a Japanese species that is sometimes cultivated in North America but rarely naturalized.

ALI AS. **HAB** F-10? C? 5? **ABU** +4.

1302--*Lysimachia fraseri* Duby

Myrsinaceae [Primulaceae*]: *Lysimachia fraseri*

This globally rare species is known only from the southern Blue Ridge or nearby, plus disjunct localities in s. Ill., w. Ky. and nw. Tenn. (Stewart Co., near the Ky. line). W noted that populations of young or suppressed plants can develop in woodlands, but they need canopy gaps to flower, then growing up to 2 m tall with a robust terminal panicle. Despite recent hunting, the only Ky. records are colls. of R. Athey from CALL and MARS (WKY, EKY) made during the 1970s.

HAB 7,11? D? 3. **ABU** g5 s2 -4?

1303--*Lysimachia vulgaris* L.

Myrsinaceae [Primulaceae*]: *Lysimachia vulgaris*

This alien has been widely grown for ornament, and has escaped in a few places; $2n = 56$ or 84 .

ALI EU. **HAB** r-4,6,7? D? 4? **ABU** +4.

1304--*Lysimachia terrestris* (L.) B.S.P.

Myrsinaceae [Primulaceae*]: *Lysimachia terrestris*

This species of northeastern wetlands is known only from a few colls. along the Ohio Rv. Cr listed the hybrid with *L. quadrifolia* (*X producta*) for Ky. but details are unknown.

HAB f-9,6 C? 3. **ABU** g8? s4? -4?

1305--*Lysimachia quadrifolia* L.

Myrsinaceae [Primulaceae*]: *Lysimachia quadrifolia*

This is widespread across eastern states, but generally restricted to woods on relatively dry acid soils. It is known to hybridize with *terrestris*; $2n = 84$ in both species.

HAB f-7,11,10 B 3. **ABU** g10 s10 -2.

1306--*Lysimachia nummularia* L.

Myrsinaceae [Primulaceae*]: *Lysimachia nummularia*

This creeping alien has become widespread in eastern North America, especially on trails or other disturbed ground in damp woodlands. Plants spread clonally, and there is little reported seed production; much more variation may exist in Eurasia (FNA 8). The first Ky. records may be colls. of B during the 1930s.

ALI EU. **HAB** f-6,4,9 :: D 3. **ABU** +6.

1307--*Lysimachia ciliata* L.

Myrsinaceae [Primulaceae*]: *Lysimachia* <Steironema> *ciliata*

This is widespread across eastern and central North America, generally in thin woods on well-drained levees and streambanks. Variation needs further study.

Some less robust southeastern plants, especially in more swampy woods of the lower Mississippi Valley, tend to have narrower leaf blades (ca. 1.5-3 cm versus 4-6 cm; l/w ca. 3-4 versus 2-2.5), inflorescences with less branching into subverticillate clusters, smaller flowers with more sharply dentate petals, and less conspicuous sepal venation. Such plants have been collected from GRAV (R. Athey 2351 at MO) and adjacent Stewart Co., Tenn. (APSU). They may deserve taxonomic recognition, or perhaps just represent transitions to *lanceolata*.

The potential for fertile hybrids among species of section *Seleucia* (= *Steironema*) is well known, though further documentation is needed from the field (Coffey & Jones 1980; F, W). Diploids ($2n = 34$) predominate in these species, except that *ciliata* mostly has much higher numbers ($2n = 92-112$),

with diploids reported only from southeastern states. *L. ciliata*, *L. hybrida* and *L. lanceolata* form a species-complex with petioles usually ciliate for most of their length, and erect stems on spreading rhizomes.

HAB 4,5 D 3. **ABU** g10 s10 -3.

1308--*Lysimachia hybrida* Michx.

Myrsinaceae [Primulaceae*]: *Lysimachia* <Steironema> *hybrida* (*lanceolata* var. h.)

This occurs mostly in base-rich wetlands of upper midwestern and northeastern coastal regions, but with widely scattered disjunct populations across North America. It has been treated as a variety or subspecies of *lanceolata* by some authors (Ray 1956, Coffey & Jones 1980), and it has also been confused with narrow-leaved plants of *ciliata*. Treatments and keys have been rather discordant; see also Sm, F, St, Cr, W.

Compared to *lanceolata*, *hybrida* usually has more conspicuous sepal venation and larger capsules (ca. 3-6.5 x 4-4.5 mm versus 2-4.5 x 2.5-4 mm). Leaves usually lack cilia on blade bases (as found in typical *lanceolata*); blades are usually plain green (versus bluish), the larger mid-cauline ones relatively broad (l/w ca. 4-6 versus 8-12), with more rounded and petiolate bases. Plants tend to be taller (up to 9-10 dm versus 5-6 dm), with more, longer branches; leaves tend to decline in size up stems and do not persist at bases (versus increasing up stems and persisting at bases). Rhizomes are relatively short and freely rooting (versus long and stoloniform).

There are a few old colls. of *hybrida* from FAYE (C.W. Short at GH/KY from "moist meadows/ ground near/ around Lexington"), MERC (Univ. of Illinois) and perhaps MCRE (B). But the only convincing post-1950 colls. in Ky. are by W. Meijer from JESS (KY, MO) and E.W. Chester from LYON and TRIG (APSU). Chester also collected an unusually narrow-leaved plant in LYON that suggests a transition to *quadriflora*.

HAB 6,7,4? D? 4? **ABU** g8? s3? -4?

1309--*Lysimachia lanceolata* Walt.

Myrsinaceae [Primulaceae*]: *Lysimachia* <Steironema> *lanceolata* (var. l.) This widespread eastern species is highly variable, especially in leaf width, even within plants, the upper ones typically much more elongated than lower. This variation may be associated with habitats. In Ky. *lanceolata* occurs mostly in openings on damp soils that dry out in summer and fall, ranging

from rocky riverbanks to seeps, swales and ditches on ridges. It is curiously rare or absent from the Bluegrass region to central Tenn. (PL).

Potentially segregated plants on seasonally xeric sandy soils in southeastern states known as *L. heterophylla* Michx. have generally narrower upper leaves and other differences from typical *lanceolata*, which may be centered in midwestern regions (Sm). In Ky. plants from rocky banks of the Cumberland Rv. and its major tributaries may be referred to *heterophylla*; these are in PULA, ROCK, MCRE and WHIT. But some other narrow-leaved plants can appear transitional to *hybrida* and may also be confused with *quadriflora*; see notes under those names. There may also be some hybridization with *ciliata* in southeastern states, as det. by J. Coffey and others at MO, NCU and elsewhere.

HAB f-7,11,6,10 C? 4. **ABU** g10 s10 -2.

1310--*Lysimachia quadriflora* Sims

Myrsinaceae [Primulaceae*]: *Lysimachia* <Steironema> *quadriflora* This largely midwestern species of wet meadows, fens and streambanks is very rare in southeastern states Ray 1956, W), where replaced locally in Ala. and Ga. by the related species, *L. graminea* (Greene) Hand.-Mazz. The few Ky. records of *quadriflora* are mostly old and obscure, from BATH (or perhaps ROWA, based on M's interpretation of a Short & Peter coll. at PH from "Licking River" area), JEFF (C.W. Short at PH, from "slate bluff below Louisville"), and MCRE (Rogers 1941). In Tenn. it is known only from Bradley Co. (TENN).

L. quadriflora can be confused with *hybrida* (see notes there), but has less distinctly veined sepals; also, narrower leaves (2-7 mm versus mostly 5-20 mm), with no distinct petiole, more prominent mid-vein but less distinct secondary veins, and smooth revolute margins (versus scabrellous to ciliate, not revolute).

HAB 9,6,1 D? 4? **ABU** g8? s2? -5?

1311--*Lysimachia radicans* Hook.

Myrsinaceae [Primulaceae*]: *Lysimachia* <Steironema> *radicans* This southeastern species occurs mostly in swampy woods of the lower Mississippi watershed. It resembles small plants of *ciliata*, but is quite distinct in its prostrate stoloniferous habit and other characters.

HAB 6,3? D? 2. **ABU** g7? s2 -4?

1312--*Lysimachia tonsa* (Wood) Wood ex Pax & R. Knuth

Myrsinaceae [Primulaceae*]: *Lysimachia* <*Steironema*> *tonsa* (S. intermedia)
This largely southern Appalachian species of dry woods resembles the much more widespread *ciliata* of lowlands. The outlying coll. reported from HEND (MO) by Ray (1956) is presumably *ciliata*, and should be rechecked; see also Ch.

HAB 11,5 C 2. **ABU** g8 s7 =.

1313--*Trientalis borealis* Raf.

Myrsinaceae [Primulaceae*]: *Trientalis* [*Lysimachia*] *borealis*
South of W.Va. and Va., this northeastern species is known only from a few cooler Appalachian localities. It was discovered below sandstone cliffs at two close localities in WOLF by D. Dourson (Campbell et al. 1989), mostly growing on slightly drier ground above large patches of *Oxalis montana* on lower slopes. Without flowers, it can be mistaken for a stunted *Lysimachia quadrifolia*. It is much shorter (ca. 1-2 dm versus 3-9 dm), with only one whorl of leaves, but it has one of the highest chromosome numbers of North American Primulaceae; 2n = 96.

HAB 5 / A 1. **ABU** g10 s2 =.

1314--*Samolus parviflorus* Raf.

Samolaceae [Primulaceae*]: *Samolus parviflorus* (*floribundus**; *valerandi* ssp. p.)

This ranges widely across humid, temperate and tropical regions of the Americas, but it is remarkably uniform, with no recognized segregates; 2n = 26 (FNA 8). Although typically found along small streams in partial shade, it can also occur in various damp upland situations, sometimes growing from dormant seed when soil is disturbed. See FNA 8 and W (with cited literature) for notes on nomenclature at species and family level; arguments can be made for Primulaceae, Theophrastaceae and Samolaceae.

HAB f-4,6,9 ::: D 4. **ABU** g10 s10 -2.

1315--*Ipomopsis rubra* (L.) Wherry C

Polemoniaceae: *Ipomopsis rubra* (*Gilia* r.)

This southeastern biennial has been cultivated in gardens north of its range. The only Ky. record is a coll. from MCRA by R. Athey (#347, probably at MEM; BA).

1316--*Phlox divaricata* L. var. *divaricata*

Polemoniaceae: *Phlox* <*Divaricatae*> *divaricata* var. d.

This species is widespread in mesic woods of eastern states; see also under var. *laphamii*.

HAB 5,7,4 D 1. **ABU** g10 s10 -3.

1317--*Phlox divaricata* L. var. *laphamii* Wood

Polemoniaceae: *Phlox* <*Divaricatae*> *divaricata* var. *laphamii*

This largely midwestern taxon with unnotched petals is generally distinct from var. *divaricata*, which is centered in Appalachian regions. Their ranges have little overlap in Ky. or elsewhere (Wherry 1955). But a coll. from HEND (EKY) does appear intermediate.

Also, occasional hybridization with *pilosa* and other species of eastern North America can be expected (Wherry 1955, Levin 1966); 2n = 14 in most of these species. A coll. from Backusburg Hill in CALL (EKY) suggests hybridization with *amoena* or *pilosa*. Recent analysis of DNA sequences in diverse taxa has failed to clarify some relationships, probably because reticulate evolution has played a significant role in the genus (Ferguson & Jansen 2002).

HAB 5,7,4 D 1. **ABU** g9 s8 -3.

1318--*Phlox pilosa* L.

Polemoniaceae: *Phlox* <*Divaricatae*> *pilosa* (ssp. p., *aristata*)

This early-flowering species of native grasslands and open woodlands has a widespread range in eastern North America, but often occurs in highly fragmented populations. It may be relatively sensitive to spring burning, browsing, mowing or herbiciding, compared to more late flowering wildflowers. In Ky. it is concentrated in remnants of "barrens" and rocky glades in three disjunct regions: (1) western margins of Appalachian Plateaus and adjacent Knobs; (2) northern Karst Plain and western Knobs; (3) Coastal Plain and transitions to the Pennyrhile karst plain (mapped here with open dots).

Further work is needed on potential taxonomic differences between these three regions. Plants in Ky. mostly have long hairs, with frequent glands in the inflorescence, and are referable to var. *pilosa* of east-central states (including var. *virens*). At least some of the plants in region 3 have only long eglandular hairs and may be referable to var. *amplexicaulis* (Raf.) Wherry sensu lato (including the less pubescent ssp. *pulcherrima* Lundell according to Cr), which occurs in the lower Mississippi Valley and west to Texas; but see also notes under ssp. *deamii*. Records of the more northwestern var. *fulgida*

Wherry and the more southwestern var. *ozarkana* Wherry appear to be erroneous (M).

HAB r-10,12,7 D 4. **ABU** g9 s7 -4.

1319--Phlox pilosa L. ssp. deamii Levin

Polemoniaceae: Phlox <Divaricatae> *pilosa* ssp. *deamii* (?var. *amplexicaulis*) Mapping here is provisional. These globally imperiled plants are known only from sw. Ind., w. Ky. and nw. Tenn., usually on medium acid soils (Levin 1966, Cr). They may be derived from hybridization of *pilosa* and *amoena*, with some back-crossing into *pilosa*. Wherry (1955) included them within *P. pilosa* var. *pulcherrima* Lundell, which occurs mostly further south in oak/pine woods of the lower Mississippi Valley. The Ky. records are clustered between the western cluster of *pilosa* (which may be at least partly var. *pulcherrima*) and, in south-central counties, *amoena*.

These plants are similar to *pilosa* in their (non-glandular) pubescent corolla tubes, but approach *amoena* in their more compact cymes (pedicels up to 3-7 mm) and less elongated leaves (l/w ca. 7-10). The uncertain record from CALL (EKY) is based on a plant that may result from hybridization between *divaricata* and *amoena* or *pilosa*.

HAB r-10,12,7 C? 4. **ABU** g4? s4? -4?

1320--Phlox amoena Sims var. amoena

Polemoniaceae: Phlox <Divaricatae> *amoena* var. *a*.

In Ky. this southeastern species is a somewhat conservative remnant of more open woodland and grassland on acid soils. It remains locally common on the Cumberland Plateau and adjacent hills to the west, especially along rights-of-way. But it has become rare or locally extinct further west in the former Big Barrens region, where most colls. date from before 1950. There are also 1840s colls. of "*pilosa*" by C.W. Short (GH, NY) from "barrens of Ky.", some stating "abundant"; these may be from CHRI. For "*pilosa*" Short (1840) noted: "It occurs in great abundance in early spring in the barrens; and it is a very handsome, low species, with dark purple flowers."

Compared to *pilosa*, *amoena* has distinctively compact cymes (with longest pedicel branches ca. 2-5 mm versus 5-15 mm), and deeper red-purple corollas with glabrous tubes (versus usually hairy). Also, its mid-cauline leaves are usually shorter (ca. 1.5-3 cm versus 3-4.5 cm), more or less oblanceolate (versus lanceolate to a sharp tip), with l/w ca. 4-6 (versus 9-12). Plants are generally shorter (ca. 15-30 cm versus 30-60 cm) and somewhat

decumbent (versus more or less erect). Pubescence is strictly non-glandular (versus non-glandular or glandular). *P. amoena* tends to occur on more acid, infertile soils than *pilosa*, and does not persist in gardens without special care (Wherry 1955; confirmed by personal experience of JC).

HAB r-10,12,7 C 4. **ABU** g8 s7 -3.

1321--Phlox amoena Sims var. nov.

Polemoniaceae: Phlox <Divaricatae> *amoena* var. nov. {Big South Fork type} This segregate of *amoena* is known only from open boulder-cobble bars along the Big South Fork of Cumberland Rv. (in MCRE. Ky., and Scott Co., Tenn.), and along the Obed Rv. (Morgan Co., Tenn.). [These plants were initially referred by M in error to *P. pilosa* var. *detonsa* (Gray) Wherry, which is a glabrous plant of pine woods further south.] Typical *amoena* occurs on adjacent uplands, but is generally absent on the river bars. In plants on the bars, leaves below the inflorescence are largely glabrous, except for the margins of petiolar bases; stems are thinly hirsute. In typical *amoena*, leaves and stems are densely hirsute. Local adaptation to stream-scouring (rheophytic) conditions is also known in *P. pilosa* ssp. *sangamonensis* Levin & D.M Smith of c. Ill., and in *P. pilosa* var. *riparia* Wherry on the Edwards Plateau in Tex. (Wherry 1955; Cr).

HAB 1 C? 5. **ABU** g6 s4 -1.

1322--Phlox amplifolia Britt.

Polemoniaceae: Phlox <Paniculatae> *amplifolia*

This is distributed in east-central states with a curiously fragmented range. One concentration of records occurs in s. Ind. and nc. Ky., perhaps centered on glacial refugia along the lower Kentucky River (as in *Boechera dentata*) and lower Salt River (as in *Phlox pilosa*). It has sometimes been confused with *paniculata*, but differs in many characters and tends to occur in more mesic woods on slopes, while *paniculata* usually occurs on floodplains (Wherry 1929-34; F, Cr, W). A few colls. suggest hybridization between these two species, but there is no definitive evidence.

HAB 5,4,7? D 2. **ABU** g8 s8 -3.

1323--Phlox paniculata L.

Polemoniaceae: Phlox <Paniculatae> *paniculata*

This vigorous riparian species is widespread in east-central states. It is also widely cultivated, and native status remains uncertain in a few of the records mapped here. The white-flowered form is infrequent in the wild, but relatively common in cultivation. See notes under *amplifolia*.

HAB 4,6,7 D 3. **ABU** g10 s10 -3.

1324--Phlox ovata L. R

Polemoniaceae: Phlox <Ovatae> ovata (latifolia)

This occurs mostly in the Allegheny and Blue Ridge mountains, but with disjunct sites west to e. Ind., across the Ohio Rv. from JEFF and MEAD. In Ky. there is a record of Pr (addenda) from WARR, but a coll. has not been located (M). BA's report was based on misidentified triflora (M). Locklear (2011) has noted the correctness of ovata as the name for this species.

1325--Phlox triflora Michx.

Polemoniaceae: Phlox <Ovatae> triflora (glaberrima* var. t., carolina var. t.)

This largely Appalachian taxon has been treated as a variety of the east-central glaberrima or the southeastern carolina (see notes under those species), but further revision is needed. Initial DNA-sequencing has indicated that triflora does not clearly belong to either species, and some samples suggest a near-basal position in the whole glaberrima-pilosa complex or even affinity to paniculata (Ferguson & Jansen 2002).

P. triflora appears to be generally distinct in Ky., and it may be closest to glaberrima, based on its "subcampanulate" calyx (W). Records from the Shawnee Hills of w. Ky. and s. Ind. are verified (see also D), but other disjunct western colls. should be rechecked for transitions to glaberrima or carolina. Curiously, triflora is unknown in the Cumberland Mts. (at least in Ky.) and elsewhere in the higher central Appalachians (where latifolia is centered). However, its range wraps around from east to south to west (Wherry 1955; W). The habitat for triflora is sometimes reported to be mostly "wet" (like glaberrima), but in Ky. these plants are generally on well drained sites (like some carolina).

P. triflora generally differs from glaberrima and carolina (Wherry 1955) in its smaller inflorescences (with ca. 12-25 flowers versus 15-125), but its flower parts tend to be larger, on average. It is a relatively short plant (ca. 4-6 dm) with only ca. 7-9 leaf-bearing nodes and moderately narrow leaves (ca. 5-10 mm wide), but the other two species vary much in those characters. The clearest differences from glaberrima (W) may be its less elongated leaves (l/w averaging ca. 6 versus 12), shorter sepals (8-12 mm versus 7-9 mm), and smaller ultimate cymules (usually with 3 versus 5-7 flowers).

HAB 8,7,4? B 3. **ABU** g8? s8 -2.

1326--Phlox glaberrima L. var. glaberrima R

Polemoniaceae: Phlox <Ovatae> glaberrima* var. g. (melampyrifolia)

Further revision is needed, but this taxon appears to be largely centered on the Piedmont further east (Va., N.C. & S.C.), disjunct from var. interior (Wherry 1955; W). Wherry (1929-34) did initially map this taxon in MARS and MCRA, and F indicated a broad southern range including w. Ky. However, these and other reports of var. glaberrima or var. melampyrifolia (Salisb.) Wherry may be erroneous (M).

1327--Phlox glaberrima L. var. interior Wherry

Polemoniaceae: Phlox <Ovatae> glaberrima* var. interior

All material of this species in Ky. seems to be var. interior, which occurs largely on the Interior Low Plateaus and adjacent glacial plains, especially in Ind. and Ill. However, colls. should also be rechecked for possible confusion or intergradation with other taxa.

HAB 9,6,10? C 4. **ABU** g8 s8 -4.

1328--Phlox carolina L. ssp. carolina R

Polemoniaceae: Phlox <Ovatae> carolina ssp. carolina ("glaberrima"*)

P. carolina (broadly defined) may be distinguished from glaberrima (broadly defined) as follows (W): "calyx subcylindric (versus subcampanulate), the sepals fairly broad, with a rather weak midrib, the junction membranes thin, narrow, narrow, becoming markedly plicate keeled." Sm noted that typical carolina "represents an intermediate between [latifolia, glaberrima and maculata], and grades into them in some colonies." It appears closest to glaberrima, but usually has purple-streaked stems like maculata; see notes under maculata.

Ssp. carolina is centered around the southern Piedmont and southern Appalachians, while ssp. angusta ranges more widely across the southeast (see notes under that name). Wherry (1955) mapped ssp. carolina in w. Tenn. and se. Mo., close to w. Ky. Although verification is needed, there appears to be at least one coll. of this southeastern taxon from CALL (MUR; see also BA).

1329--Phlox carolina L. ssp. angusta Wherry

Polemoniaceae: Phlox <Ovatae> carolina ssp. angusta

This rather poorly known segregate of P. carolina is distinguished by having relatively narrow, basally-concentrated leaves. It occurs on damp sandy soils, including open boggy sites and sandy river-banks, from sw. N.C. to ne. Tex. and north to s. Ill. (Wherry 1955; W). Wherry (1955) mapped it on the Coastal

Plain within w. Ky. (included here as imprecise uncertain locations), and there appears to be a coll. of this taxon from MCRE, "on sandstone shelf at Pitch Rapid" of Cumberland Rv. (R. Jacobs #205801 at EKY).

Wherry noted "late spring" for the blooming period of *angusta*, but flowering colls. from the Cumberland Plateau are dated much later: Jul 23 (MCRE); Jul 29 (on banks of Daddy's Creek in Cumberland Co., Tenn.); and Oct 10 (on banks on Obed River in Morgan Co., Tenn.); and see other colls. at TENN. *P. Zale* (pers. comm.) has found a similar range of flowering by ssp. *angusta* in cultivation.

HAB 9,1? B? 4. **ABU** g8? s2? -3?

1330--Phlox maculata L. var. pyramidalis (Sm.) Wherry

Polemoniaceae: *Phlox* <Ovatae> *maculata* var. *pyramidalis* (purpurea)
Variation in this eastern species needs further attention. Most plants in Ky. are clearly referable to var. *pyramidalis*, which has more numerous, crowded, narrower leaves and later flowering (Wherry 1955; F, W). Some appear at least transitional to the more northern var. *maculata*, but that taxon may not be clearly distinguishable in Ky. Reported ranges of these varieties overlap extensively in Ky.

Some plants mapped here under *maculata* lack purple spotting on the stems, and have been confused with *glaberrima*. These appear concentrated in southeastern counties: including HARL, JACK, MCRE and WAYN (EKY). Natural hybrids between *glaberrima* and *maculata* have been documented, and appear suggestively similar to *carolina* (Levin 1963).

HAB 9,6,1 B 4. **ABU** g9 s8 -3.

1331--Phlox maculata L. var. maculata

Polemoniaceae: *Phlox* <Ovatae> *maculata* var. *m*.
Mapping here is tentative; see notes under var. *pyramidalis*. The definitive records (solid dots on map) come from B, who consulted with Wherry (1929-34, 1955). Other records are based on colls. examined by JC that have relatively short but with thick stems, broad subcordate leaves and large flowers; these include colls. at EKY from LAWR, MENI, PULA and WOLF.
HAB 9,6,1 B 4. **ABU** g9 s5? -3.

1332--Phlox stolonifera Sims

Polemoniaceae: *Phlox* <Stoloniferae> *stolonifera*

This occurs mostly in the central and southern Appalachians. It is generally uncommon but locally abundant, as in Ky. on terraces along streams of the central and northern Cliff Section. It is curiously rare or absent in most of the Red Rv. watershed. *P. stolonifera* differs from all other eastern species of *Phlox* in its sterile prostrate basal stolons, produced at anthesis, that form large clonal patches of stems with spatulate to obovate leaves; also $2n = 28$ (versus usually 14). *P. divaricata* is also somewhat stoloniferous, but has elliptic to oblong leaves. Also, flowers of *stolonifera* are deep red-purple with unnotched petals, unlike typical *divaricata*.

HAB 5,4,7 B 2. **ABU** g8 s6 -2.

1333--Phlox subulata L. var. australis Wherry

Polemoniaceae: *Phlox* <Subulatae> *subulata* var. *australis*
This is known only from central Appalachian regions further east (sometimes combined with var. *brittonii* in var. *setacea*), and along the disjunct western margins of the Appalachian Plateaus in Ohio and Ky. (Wherry 1955, Cr). Similar distribution patterns are found in *Paxistima canbyi* and *Solidago harrisii* Campbell et al. (1993); see also *Draba ramosissima*. Typical var. *subulata* is more northern.

Records mapped here are from plants that appear native, excluding the generally more robust cultivars that occasionally persist along roadside banks. These cultivars include hybrids of *subulata* with *bifida*, some of which are known as "Stellaria" (Wherry 1955). Hybrids of *subulata* with *P. nivalis* Lodd. ("Froncosa") and *P. stolonifera* Sims ("Amoena") may also be cultivated.

HAB 12 +\ D 4. **ABU** g8 s6 =.

1334--Phlox bifida Beck var. bifida

Polemoniaceae: *Phlox* <Subulatae> *bifida* var. *b*.
This occurs in midwestern regions, usually on sandy soils. In Ky it is known only from two disjunct localities in Ky.: (1) on a gravelly ridge in CALL (MUR); and (2) on limestone clifftops along the Green River in HART (KY) and perhaps EDMO (Faller 1973). The latter plants (2) appear somewhat transitional to var. *cedaria*.

HAB 12 +\ D 4. **ABU** g8 s2 -2?

1335--Phlox bifida Beck var. cedaria (Brand) Fern.

Polemoniaceae: *Phlox* <Subulatae> *bifida* var. *cedaria* (ssp. *stellaria**)
This variety is known only from c. Tenn., c. Ky. and s. Ind. In Ky. it is known only from a few populations on clifftops of narrow points along the Kentucky

River Palisades. It is distinguished by its relatively glabrous, eglandular inflorescence, but there is much variation in pubescence and flower shape that needs to be studied further.

HAB 12 +\ E 4. **ABU** g6 s4 =.

1336--*Polemonium reptans* L. var. *reptans*

Polemoniaceae: *Polemonium reptans* var. r.

This is centered in east-central states. Some colls. mapped here may be transitional to var. *villosum*.

HAB 5,4,7 D 1. **ABU** g10 s10 -3.

1337--*Polemonium reptans* L. var. *villosum* E.L. Braun

Polemoniaceae: *Polemonium reptans* var. *villosum*

This occurs only in Ohio and Ky., on relatively acid soils along the western edge of the Appalachian Plateaus and in the adjacent Knobs. Uncertain records (mapped as open dots) are unusually pubescent, but they lack the dense long glandular hairs of typical var. *villosum*, and they mostly occur west of Appalachian regions.

HAB 5,4,7 C 1. **ABU** g7 s7 -2.

1338--*Impatiens balsamina* L. C

Balsaminaceae: *Impatiens balsamina*

This subtropical species from south Asia is widely cultivated. It occasionally escapes but it may not be truly naturalized in North America. In Ky. there are records from PIKE, PULA (MM for WKY) and ROWA (MDKY).

ALI AS.

1339--*Impatiens pallida* Nutt.

Balsaminaceae: *Impatiens pallida*

This tall woodland herb is widespread in eastern North America, except on the southeastern Coastal Plain (K, W). Before flowering, *pallida* can usually be distinguished from *capensis* by the glaucous bloom on its young stems and upper leaf surfaces; also, the crenulations on its leaves tend to be more rounded. *I. pallida* is reportedly pollinated by bumble-bees in general, while *capensis* may be largely dependent on humming-birds (as reviewed by Y); hybrids are unknown. Rare plants of *pallida* with creamy white flowers, named forma *speciosa* Jenn., have been observed by D. Dourson (pers. comm.) and JC along Indian Creek in MENI.

HAB 4,5 :: D 2. **ABU** g10 s10 -3.

1340--*Impatiens capensis* Meerb.

Balsaminaceae: *Impatiens capensis* (biflora)

This ranges widely over eastern and central North America, and it occurs in more open, stressed or disturbed habitats than *pallida*. Forms with unusual flower colors have been reported in other states (e.g. F, Y), but are unknown in Ky.

HAB 4,6,7,9 ::: D 3. **ABU** g10 s10 -2.

1341--*Mertensia virginica* (L.) Pers. ex Link

Boraginaceae: *Mertensia virginica*

This occurs in east-central states, generally in woods on toe-slopes and terraces with moist fertile soils. In Ky. many localities are restricted to islands, where plants may have been protected from browsing and rooting by livestock. It is unusually extensive up to clifflines in a few areas, suggesting more local protection: e.g., in and near Flora Cliff Nature Preserve of FAYE and along the Green Rv. in EDMO (A. Meier, pers. comm.).

HAB 5,4,7 D 2. **ABU** g9 s9 -4.

1342--*Onosmodium hispidissimum* Mack.

Boraginaceae: *Onosmodium hispidissimum* (molle ssp. h.)

This largely midwestern species has become rare in Ky. and elsewhere (Y) within the past few decades, surviving in rocky calcareous old fields and rough pastures with little fescue or other improvement. Most records date from before 1970 and come from the Bluegrass Region. Some historical records suggest association with large trails or licks used by bison or other large herbivores before settlement.

Most colls. are referable to typical *hispidissimum* ($2n = 24$), which was treated by Cronquist as a variety of *O. molle* ($2n =$ unknown). A few colls. from LOGA, TODD (WKY) and perhaps elsewhere are more or less transitional to typical *molle*; see notes under that name. Further research across east-central states is also needed to check on distinction of the western *O. occidentale* (see below), and the southeastern *O. virginianum* (L.) DC. (? = *O. carolinianum* DC. of Pr). The latter has been reported from the state but probably in error (M).

HAB g-10,12 + E 5. **ABU** g7? s3 -5.

1343--*Onosmodium molle* Michx. T

Boraginaceae: *Onosmodium molle* (ssp. m.)

See notes under hispidissimum, which seems to intergrade with molle in LOGA and perhaps elsewhere. The status and distribution of true molle (as a var., ssp. or species) remains uncertain, given the varied treatments and identifications (e.g. Baskin et al. 1983, Turner 1995a; and their citations). Typical molle may be virtually restricted to c. Tenn., where it is locally common in the cedar glades and nearby farmland. The only other verified records may be from one locality in s. Ill. and one in n. Ala. It differs from hispidissimum in its distinctly pitted nutlets, smaller leaves (up to 8 x 2 cm versus 15 x 4 cm), relatively dense soft pubescence on leaves (giving plants a distinctive greyish appearance), denser somewhat corymbiform inflorescence, and shorter stature (mostly 30-70 dm tall versus 50-120 cm).
HAB g-12,10? + D 5. **ABU** g6 s1? -5?

1344--Onosmodium occidentale Mackenzie

Boraginaceae: *Onosmodium occidentale* (molle ssp. o.)
This member of the molle complex may be relatively distinct, based on morphology and chromosome number ($2n = 28$); see Y and his citations. It is centered in the Great Plains.
HAB g-12,10? + D? 4. **ABU** g8 s1 -6?

1345--Lithospermum croceum Fern. R

Boraginaceae: *Lithospermum croceum* (caroliniense var. c.)
This is not verified from Ky. Most or all reports have been based on misidentified colls. of *canescens* from ADAI (at Field) or perhaps *tuberosum* (M). However, *croceum* may be expected in Ky. since it is widespread in the midwest and Great Lakes region, including se. MO. (Y), much of Ill. and w. Ind. (PL). The closely related southeastern species, *L. caroliniense* (Walter ex J.F. Gmel.) MacMill., appears to intergrade with *croceum* in Mo. (Y), but remains unknown in Tenn. (Ch); $2n = 24$ in both species.

1346--Lithospermum canescens (Michx.) Lehm.

Boraginaceae: *Lithospermum canescens*
This diploid ($2n = 14$) is widespread in midwestern and eastern regions. In Ky. it is generally restricted to remnants of native grassland on rocky calcareous sites.
HAB 12,10 + E 5. **ABU** g9 s8 -3.

1347--Lithospermum tuberosum Rugel ex DC.

Boraginaceae: *Lithospermum tuberosum*

This southeastern species is typical of woodlands on mesic to subxeric calcareous soils, especially along animal trails. Reports from ROBE and PIKE are dubious, pending location of colls. (M).
HAB 11,5,7 +? D 3. **ABU** g8 s7 -2.

1348--Lithospermum latifolium Michx.

Boraginaceae: *Lithospermum latifolium*
This tetraploid ($2n = 28$) is widespread in east-central states and the Great Lakes Region, but relatively uncommon. In Ky. it is largely restricted to subxeric woods on rocky calcareous slopes, especially along leached ledges or leads.
HAB 11,5 +? C? 3. **ABU** g9 s8 -2.

1349--Lithospermum officinale L. R

Boraginaceae: *Lithospermum officinale*
This Eurasian weed ($2n = 28$) was reported from Ky. by McFarland (1942) and others, but no coll. is known and there has been some confusion with *latifolium*. It has not been confirmed in southeastern states (Ch, W).
ALI EU.

1350--Buglossoides arvensis (L.) I.M. Johnston

Boraginaceae: *Buglossoides* [*Lithospermum*] *arvensis*
This tetraploid ($2n = 28$) was first reported by Short (1837): "within the last year or two has made its first appearance in this neighborhood, where it is rapidly over-running the lots and commons around Lexington and is likely soon to become a pestiferous weed." Gm noted in 1914: "a very common pasture weed... also in clover and alfalfa meadows. Commonly observed on waste land. Locally abundant."
ALI EU. **HAB** F-10,12 ::? D 6. **ABU** +5.

1351--Echium vulgare L.

Boraginaceae: *Echium vulgare*
This Mediterranean weed is widely scattered in Ky. but usually in small numbers. Colls. from GARR (KY) and elsewhere appear transitional to var. *pustulatum* (Sibthorp & Sm.) Coincy, which is treated as a species by some authors. However, no colls. are clearly referable to that taxon (M).
ALI EU. **HAB** R-10,12 ::? D 6. **ABU** +5.

1352--Symphytum officinale L. C

Boraginaceae: *Symphytum officinale* (ssp. o.)

This commonly cultivated Eurasian plant ("comfrey") sometimes persists in old gardens, and it was reportedly naturalized in some places early after settlement (Short & Peter 1835). However, it has not become established in the wild (Gm, M). Although considered medicinal for varied purposes and used as forage for some livestock, this species--and several other Boraginaceae--can become toxic for generalist herbivores due to pyrrolizidine alkaloids (Culvenor 2000, Stewart & Steenkamp 2001).

ALI EU.

1353--*Symphytum asperum* Lepechin C

Boraginaceae: *Symphytum asperum* (asperimum; plus hybrids)

In North America, this Caucasian alien is largely restricted to northern regions. The only record from Ky. is the note of Gm: "seen in cultivation, or as an escape." The frequently cultivated plant known as "Russian comfrey" is a robust vigorous hybrid between officinale, which is a variable species (2n = 20 to 56), and asperum, which is more uniform (2n = 32). This hybrid is named *S. X uplandicum* Nym., and usually has 2n = 36 or 40. It has been confused with typical *asperum* in North America; see Gadella (1984) for details.

ALI EU.

1354--*Myosotis scorpioides* L.

Boraginaceae: *Myosotis scorpioides* (var. s.)

This perennial "forget-me-not" is sometimes cultivated, and occasionally persists or escapes.

ALI EU. **HAB** 9,1 ::? C 6. **ABU** +4.

1355--*Myosotis laxa* Lehm.

Boraginaceae: *Myosotis laxa*

This is a widespread northern (circumboreal) species that extends south along the higher Appalachian Mts. In Ky. the only record is a coll. from ROWA (MDKY): S. Ison #89, 10 Oct 1973, "Triplett Creek bed sandbar, sunny wet, probably rich soil."

HAB 2,1? ::? C? 6? **ABU** g10 s2? -4?

1356--*Myosotis arvensis* (L.) Hill

Boraginaceae: *Myosotis arvensis* (*scorpioides* var. a.)

This alien is widespread across northern regions of North America, but in Ky. there only a few records. Several unverified reports are not mapped (M); there has been confusion with the native *macrosperma*.

ALI EU. **HAB** F-10 ::?: E? 6. **ABU** +4.

1357--*Myosotis stricta* Link ex Roemer & J.A. Schultes

Boraginaceae: *Myosotis stricta* ("micrantha")

Within North America, this weedy alien occurs mostly in northern regions.

ALI EU. **HAB** F-10 ::?: D? 6. **ABU** +4.

1358--*Myosotis macrosperma* Engelm.

Boraginaceae: *Myosotis macrosperma* (*verna* var. m.)

This widespread eastern species is sometimes confused with *verna*, but it differs in several characters and its woodland habitat. There is no evidence of intergradation (Y).

HAB 7,8,10 :: D 3. **ABU** g9 s9 -2?

1359--*Myosotis verna* Nutt.

Boraginaceae: *Myosotis verna* ("virginica")

This weedy native is widespread across North America.

HAB F-10,12,8 :: D 4. **ABU** g10 s8 -2?

1360--*Cynoglossum virginianum* L.

Boraginaceae: *Cynoglossum virginianum*

This widespread southeastern species is typical of submesic to subxeric woods in Ky. It is locally abundant along trails and in association with dense populations of deer, who presumably disperse the seeds and avoid browsing on the foliage.

HAB 7,11,5 :: C 3. **ABU** g10 s10 -2.

1361--*Cynoglossum officinale* L.

Boraginaceae: *Cynoglossum officinale*

This biennial, a widely scattered noxious weed, has not been reported in Ky. since the 1950s (M). The first report was by Short (1828-2): "This plant, originally exotic, has been gradually dispersed over the greater part of the Union. Common in pastures and waste grounds." In 1914, Gm noted: "most often seen growing locally along roadsides and railroads... [and] occasionally gets...a foothold in neglected pasture land..." It is toxic to livestock and may have been associated with rough sheep pasture, which landuse declined after 1940. Also, spread of *Festuca arundinacea* may have suppressed this weed.

ALI EU. **HAB** G-10 ::? D? 5? **ABU** +4<.

1362--*Hackelia virginiana* (L.) I.M. Johnston

Boraginaceae: *Hackelia* [*Lappula*] *virginiana*

This widespread eastern species is scattered through woods on damp fertile soils in Ky., especially along trails. However, it is rarely abundant, and often overlooked or confused with other boraginaceous plants.

HAB 7,8,5 ::? D 3. **ABU** g9 s9 -2.

1363--*Lappula squarrosa* (Retz.) Dumort.

Boraginaceae: *Lappula squarrosa* (*echinata*)

This alien weed is common across much of North America, but virtually absent in southeastern states, beyond the lower Mississippi Rv. and lower Ohio Rv. (PL).

ALI EU. **HAB** F-10 ::? D? 6. **ABU** +4.

1364--*Heliotropium indicum* L.

Heliotropiaceae [Boraginaceae*]: *Heliotropium* [*Tiaridium*] *indicum*

This pantropical weed is said to be introduced from Brazil or elsewhere in South America (W), but there are some early reports from North America, e.g., Rafinesque (1819). Reports of *H. europaeum* L. from Ky. are probably all based on *indicum* (M).

ALI s. **HAB** 9,2,1 ::? D? 6. **ABU** g10? s8 -1?

1365--*Heliotropium tenellum* (Nutt.) Torr.

Heliotropiaceae [Boraginaceae*]: *Heliotropium* [*Lithococca*] *tenellum*

This winter annual occurs mostly in the central and lower Mississippi Rv. watershed. It is largely restricted to rocky glades on calcareous soils.

HAB 12 == E 6. **ABU** g8 s7 -2.

1366--*Phacelia ranunculacea* (Nutt.) Constance

Hydrophyllaceae [Boraginaceae]: *Phacelia* <*Cosmanthus*> *ranunculacea*

In its strict sense, this species is restricted to lowlands of the central Mississippi Valley.

Sewell & Vincent (2006) have resurrected *P. covillei* Wats., a segregate with highly fragmented range: from Mo., Ill. and Ind. (Wabash Rv.); to Ohio (including Lawrence Co. adjacent to Ky.) and W.Va.; to Md., Va. and N.C. It is expected in Ky., and differs from *ranunculacea* as follows: hairs at mid-stem sparse, mostly appressed/strigose, rarely spreading (versus dense, mostly spreading/pilose, some retrorse), plus a few glands <2 mm tall (versus dense and mostly >2 mm); terminal leaflets subtending inflorescence with acute-cuneate or nearly attenuate bases (versus obtuse-rounded or truncate); 2n = 28

(versus 12). Habitats are similar, typically on fertile soils in subhydric to mesic forests on floodplain terrace or toe-slopes.

HAB 7,8,4? ::? E? 3. **ABU** g6 s5 -4.

1367--*Phacelia hirsuta* Nutt. ? T

Hydrophyllaceae [Boraginaceae]: *Phacelia* <*Cosmanthus*> cf. *hirsuta*

A plant resembling *hirsuta* was recently collected in MCRE (EKY), at the end of Harley-Coffee Road by Doug Stephens (R. Jones, pers. comm.). That largely Ozarkian species is considered to be a "casual adventive" in eastern states (F), but it has been confused with the southern Appalachian *P. maculata* Wood (W). More likely as a native in se. or sc. Ky. is the closely related *P. dubia* (L.) Trel. (2n - 12), which occurs in close or adjacent counties of Tenn., including its var. *interior* Fern. (Ch).

ALI W. **HAB** 12,10? + D? 3? **ABU** +4?

1368--*Phacelia purshii* Buckl.

Hydrophyllaceae [Boraginaceae]: *Phacelia* <*Cosmanthus*> *purshii*

This winter annual is largely restricted to thin woods and edges on moist base-rich soils in east-central states, and it is especially common in the central Ohio Valley. The common name is usually "Miami mist" apparently after the Miami Rv. in sw. Ohio, where this species used to carpet many miles of low woodland floors. Short (1828-9) listed it under the misapplied name *P. fimbriata*: "abundant throughout the western country... Moist meadows." It was formerly widespread on deep fertile soils of upland and lowlands in the Bluegrass region, including less manicured roadsides, but it has been grazed, mowed or herbicided out of many areas during recent decades.

Related taxa (all with 2n = 18), or transitional plants, may also be expected in Ky. At Mantle Rock (LIVI), near Grassland (EDMO), and perhaps on other sandstone outcrops in the Shawnee Hills, *purshii*-like plants are locally abundant but the dry habitats are more typical of the largely Ozarkian *P. gilioides* Brand. In "barren soil" of c. Tenn. (Sm), plants with relatively small flowers and capsules, short pedicels, and style branches longer than united portion have been segregated as *P. bicknellii* Small and may deserve recognition (W). The closely related *P. fimbriata* Michx. is largely restricted to cooler zones in the Blue Ridge, but also reported from the southern Appalachian Plateaus in Ala. (Small 1933).

HAB 7,8,4 ::? E 3. **ABU** g9 s9 -4.

1369--*Phacelia bipinnatifida* Michx.

Hydrophyllaceae [Boraginaceae]: *Phacelia bipinnatifida*

This robust biennial is largely restricted to rocky woods on moist base-rich soils in east-central states; $2n = 18$. Southern plants with smaller flowers, less exerted stamens and styles, larger less divided leaf segments, and sparser pubescence have been named var. *plummeri* Wood (F, W). However, that taxon has not been generally accepted.

HAB 5 + E 2. **ABU** g9 s9 -2.

1370--*Hydrophyllum macrophyllum* Nutt.

Hydrophyllaceae [Boraginaceae]: *Hydrophyllum macrophyllum*

This rosette-forming perennial occurs mostly in the Ohio Valley (including Tennessee Rv.), where it replaces the closely related northern species, *virginianum*. *H. macrophyllum* typically grows in mesic to subxeric woods with base-rich soils, on slightly drier sites than *canadense*. Its distinctive leaves are hairy, pinnatifid and the lower ones usually mottled with pale patches. Although *virginianum* has been widely used by humans for edible greens, there is no clear record of such use for *macrophyllum*.

HAB 5,11,7 D 1. **ABU** g9 s9 -3.

1371--*Hydrophyllum virginianum* L.

Hydrophyllaceae [Boraginaceae]: *Hydrophyllum virginianum*

This is widespread in most northeastern states and adjacent Canada, including the Ozark region and s Ill., but it is absent in most of Ky. and Tenn. In southern Appalachian regions it is largely restricted to upper elevations. The intriguing colls. from FAYE are correctly identified but old: "Milburn's Fence opposite Fonshee's Gate" in 1878 (A.M. Peter at KY-Agr.); "Lex." in 1908 (H. Garman at KY-Agr.). There are also more dubious records from the Bluegrass region: ANDE (E. Carr, pers. comm.) and WOOD (Wharton & Barbour 1991).

Var. *atranthum* (E.J. Alexander) Constance is a potential segregate in central Appalachian regions that does occur in Ky. on Black Mt. in HARL (R. Cranfill #2606 at KY); see also W and his citations. That taxon differs in its deep purple to maroon flower color (versus white to pale purple), and lower stems usually glabrous to slightly retrorse pubescent (versus slightly to densely retrorse or spreading). It needs better circumscription in Ky. and elsewhere.

HAB 5,7 D 1. **ABU** g9 s6 -1?

1372--*Hydrophyllum canadense* L.

Hydrophyllaceae [Boraginaceae]: *Hydrophyllum canadense*

This rhizomatous perennial occurs widely in mesic woods across northeastern states, including Appalachian regions. It is locally abundant in deeper woods on toe-slopes and terraces along larger streams, and may have extended into smaller tributaries before effects of settlement. In the central Bluegrass, Short (1828-9) listed the common name "Shawnee salad" and noted: "The leaves are said to be eaten by the Indians as a salad. Common in half cultivated lands, about fence corners &c."

HAB 5,4 D 1. **ABU** g9 s9 -3.

1373--*Hydrophyllum appendiculatum* Michx.

Hydrophyllaceae [Boraginaceae]: *Hydrophyllum appendiculatum*

This biennial ranges through much of the central Mississippi River and Ohio River watersheds, but with some extension into adjacent Appalachian lowlands. It typically grows in thin woods on toe-slopes and terraces with damp fertile soil.

HAB 7,4,5 E 2. **ABU** g9 s9 -3.

1374--*Nemophila aphylla* (L.) Brummitt

Hydrophyllaceae [Boraginaceae]: *Nemophila aphylla* (microcalyx, triloba)

This southeastern winter annual of lowland woods on damp fertile soils is easily overlooked or confused with *Phacelia ranunculacea* (W). It may be more widespread in small remnants of suitable habitat than records suggest. It is scattered across much of c. Tenn. (Ch).

HAB 7,4,6? E? 2. **ABU** g8 s4 -5.

1375--*Ellisia nyctelea* (L.) L.

Hydrophyllaceae [Boraginaceae]: *Ellisia nyctelea*

This winter annual is centered in the midwest (often in thin woods with *Floerkea* nearby). It has widely scattered occurrences elsewhere, but perhaps adventive in some cases. There is a coll. by G.F. Buddell from CAMP (KNK): "yardweed growing along sides of house and garage", 320 Fairview Drive, Dayton. There is also an old report from BOON (Nelson 1919).

HAB 7,6,4? E? 3. **ABU** g9 s2 -5?

1376--*Cephalanthus occidentalis* L.

Rubiaceae <Naucleae>: *Cephalanthus occidentalis*

This shrub is widespread in wetlands of eastern North America and Central America. Record mapped here include var. *pubescens* Raf., which is collected from JEFF (DHL) and probably elsewhere. That taxon has not been recognized in most recent treatments (W).

HAB 2,3,1 ~ D 4. **ABU** g10 s10 -2.

1377--*Mitchella repens* L.

Rubiaceae <Mitchelleae>: *Mitchella repens*

This creeping stoloniferous plant is widespread across eastern North America, but largely restricted to woods on acid soils in somewhat mesic sites.

HAB 7,5,11 B 1. **ABU** g10 s9 -2.

1378--*Oldenlandia boscii* (DC.) Chapman

Rubiaceae <Spermacoaceae>: *Oldenlandia* [Hedyotis] *boscii*

This perennial occurs on the southeastern Coastal Plain along shorelines and in ponded places; 2n = 36.

HAB 9,2? ::? D? 6? **ABU** g8? s4? -4?

1379--*Oldenlandia uniflora* L.

Rubiaceae <Spermacoaceae>: *Oldenlandia* [Hedyotis] *uniflora*

This southeastern annual occurs mostly on the Coastal Plain along shorelines of stagnant waters; 2n = 36, 72.

HAB 2,9 ::? C? 6. **ABU** g9? s3? -4?

1380--*Houstonia nigricans* (Lam.) Fern. var. *nigricans*

Rubiaceae <Spermacoaceae>: *Houstonia* <*Stenaria*> [Hedyotis] *nigricans* var. n.? (*angustifolia*)

This species may have been overlooked or undercollected in western regions of the state, where there are sight records from rocky glades that are not mapped here. *H. nigricans* varies greatly over its broad midwestern and southern range, and it deserves further collection and analysis; 2n = 18, 20, 36 and 40 (Church & Taylor 2005). Several southwestern segregates have been recognized, but the remaining widespread variety has not been divided (Terrell 2001).

Based on seed characters and chromosome numbers, Terrell (1996, 2001) proposed that *nigricans* belongs in a new genus, as *Stenaria nigricans* (Raf.) Terrell. Morphological and molecular data do not provide strong support for distinction of this genus from *Houstonia* (Church & Taylor 2005; W), but it could be a reasonable section.

HAB 12 == E 6. **ABU** g9 s8 -1.

1381--*Houstonia nigricans* (Lam.) Fern. var. *rupestris* (Raf.) new comb.

Rubiaceae <Spermacoaceae>: *Houstonia* <*Stenaria*> [Hedyotis] *nigricans** var. *rupestris*? {broad-leaved variant}

Terrell (2001) did not distinguish this taxon, which has no established type coll. But Rafinesque referred to it four times (Merrill 1949) and there is a potential type at NY (acc. no. 00131898): [collector not stated] "*Houstonia rupestris* Raf. ... ad rupes. fluvi. Kentucky" [cliffs bordering Kentucky Rv.]. It also appears to be the unnamed *Houstonia* of Short & Peter (1835): "only among the rich debris of the limestone cliffs bordering the Kentucky river, where rooting deeply in the fissures of the rock, it forms dense clumps of considerable magnitude, with numerous semi-prostrate stems a foot long."

Based on a review of colls. at GH, MO, NY and elsewhere, this variant of *nigricans* appears largely restricted to limestone cliff-tops along the Kentucky River Palisades, the Cumberland Rv. in Ky. and Tenn., and perhaps the Sequatchie Valley in Tenn. (KY, APSU, TENN). The largest leaves in each plant (generally at mid-stem) are ca. 3-6 mm wide, and there is less reduction into the inflorescence; axillary fascicles of narrow leaves are lacking. In typical *nigricans*, the largest leaves are usually 1-2.5 (3) mm wide; leaves are much reduced into the inflorescence; and axillary fascicles are usually present at mid-stem. The broad-leaved variant also appears to have a more decumbent, spreading habit and less congested inflorescences, with about 5-10 pure white flowers per square cm in pressed specimens; typical *nigricans* has about 10-20 pale bluish flowers per square cm. More analysis is needed to determine the degree of distinction.

HAB 12 +\ E 6. **ABU** g5? s5? =.

1382--*Houstonia caerulea* L.

Rubiaceae <Spermacoaceae>: *Houstonia* <*Houstonia*> [Hedyotis] *caerulea*

This small rhizomatous perennial is widespread on acid soils in eastern North America, except on the Gulf Coastal Plain. It is most common in thin woods and disturbed openings, and sometimes locally abundant in mowed areas. Although variable in ploidy (2n = 16, 32, 48), no segregates have been generally recognized (Cr; Church & Taylor 2005).

HAB s-7,10,11 :: B? 3. **ABU** g10 s10 -2.

1383--*Houstonia serpyllifolia* Michx.

Rubiaceae <Spermacoaceae>: *Houstonia* <*Houstonia*> [Hedyotis] *serpyllifolia* (He. michauxii)

This prostrate perennial is restricted to central and southern Appalachian regions, where it generally occurs on banks of small streams, wet rocky sites and seeps; $2n = 32$ and 48 .

HAB 1,6 ~| B 4. **ABU** g8 s2 =.

1384--Houstonia pusilla Schoepf

Rubiaceae <Spermacoaceae>: *Houstonia* <*Houstonia*> [*Hedyotis*] *pusilla* (*patens*, ?*minima*; *He. crassifolia*)

This weedy diploid ($2n = 16$) annual is widespread across southeastern states. In Ky. it occurs mostly on disturbed ground in warmer regions.

Mapped records here include *H. minima* Beck from ALLE (WKY), HICK (MUR), FULT (MUR), ?MCRA (Terrell 1996) and WARR (WKY). *F* considered *minima* to be distinct, due to its larger calyx lobes; also it tends to have smaller leaves and a lower, more sprawling habit. But Terrell indicated that this largely midwestern taxon intergrades extensively with the more widespread southern *H. pusilla*, and should not be segregated. In Ky. there is no clear difference in range or habitat.

A more distinct ($2n = 14$), southwestern relative is *H. rosea* (Raf.) Terrell, with white to pink flowers, which is known from se. Mo., close to Ky. (Terrell 1996).

HAB S-10,7 ::: C 6. **ABU** g9 s8 +1?

1385--Houstonia purpurea L.

Rubiaceae <Spermacoaceae>: *Houstonia* <*Amphiotis*> [*Hedyotis*] *purpurea* (var. p.*)

This widely distributed species of southeastern states is generally distinct from *lanceolata*, but several colls. in western regions seem transitional; see notes under *lanceolata*. Some plants of southern regions are unusually hairy: from CALL, CHRI, MCRE and TODD. Smaller plants from rocky areas can also appear distinct locally, somewhat resembling *H. montana* Small of the southern Blue Ridge. Further revision of this whole complex is needed; $2n = 12$ and 24 in most taxa of sect. *Amphiotis* (Church & Taylor 2005).

HAB 7,11,5 C 3. **ABU** g9 s9 -2.

1386--Houstonia lanceolata (Poir.) Britt.

Rubiaceae <Spermacoaceae>: *Houstonia* <*Amphiotis*> [*Hedyotis*] *lanceolata* (*purpurea** var. *calycosa*)

This largely midwestern segregate of *purpurea* differs in its narrower leaves, with l/w 3-7 (versus 1-3.2), which usually dry to a pale hue (versus uniformly darkening). Also, its calyx lobes are (3.5) 4-7 mm long (versus 2-3.5 mm), and often broader at their base. *H. lanceolata* occurs typically in open woods, fields, and rocky glades, usually on base-rich soils; whereas *purpurea* typically occurs in somewhat mesic woods or at edges, on acid soils.

Clarification of segregates within the *purpurea* complex is needed. Terrell (1996) treated *lanceolata* as *H. purpurea* var. *calycosa* A. Gray, noting that it "intergrades with var. *purpurea* in many localities, particularly at the northern part of its range (e.g. in Illinois)." But he also noted: "Anyone observing var. *calycosa* in the cedar glades [of Ala. and Tenn.] is likely to be impressed with its distinctiveness there." In Ky., only ca. 1-5% of colls. suggest transitions to *purpurea*. Other variants may deserve further study, including some unusually hairy plants within both *purpurea* and *lanceolata*. Colls. mapped here from HARL (KY, WKY) are possibly transitional from *lanceolata* to *longifolia* or a distinct variant.

HAB f-7,12,10 D 4. **ABU** g9 s9 -3.

1387--Houstonia canadensis Willd. ex Roemer & J.A. Schultes

Rubiaceae <Spermacoaceae>: *Houstonia* <*Amphiotis*> [*Hedyotis*] *canadensis* (*ciliolata*)

This is largely restricted to the northeastern Interior Low Plateaus, west-central Appalachian regions, and the western Great Lakes region. *H. canadensis* is usually found on limestone, but there are records from various shales and other substrates, and some differentiation is expected across its range; $2n = 12, 14$ and 32 (Cr; Church & Taylor 2005). In Ky., Short & Peter (1835) noted: "a plant profusely abundant on the denuded hills around the Blue-licks, in this state, and the knobs back of New Albany, Indiana..." Colls. mapped here from w. Ky. extend the range mapped by Terrell (1996), but some of these suggest intergradation with *lanceolata* (colls. from BARR and SIMP at WKU). There may also be some intergradation with *longifolia*, especially in Ind.

Although often misidentified as *longifolia* or other species, careful examination shows that *canadensis* is generally distinct due to its persistent basal rosettes of basal leaves, generally with marginal hairs 0.2-0.8 mm long; its stems with only 3-6 internodes (below the inflorescence); its lower cauline leaves often oblanceolate or obovate (Terrell 1996); and its early flowering, during April-May in Ky. (B).

Plants with unusually glabrate or short-haired basal leaves have been collected from NELS (KY), ROCK (MICH), and s. Ohio (GH). Unusually pubescent plants from sw. Va., in "The Cedars" area of Lee Co., have been named *H. setiscaphia* L.G. Carr (or *H. canadensis* var. *setiscaphia* (L.G. Carr) C.F. Reed). Similarly pubescent plants have been found in Adams Co., Ohio (GH), and should be searched for in Ky. Such plants have not been segregated by Terrell (1996) or others in recent treatments.

HAB f-12,10 == D 6. **ABU** g9 s9 -2.

1388--*Houstonia longifolia* Gaertn. var. *compacta* Terrell

Rubiaceae <Spermacoaceae>: *Houstonia* <Amphiotis> [*Hedyotis*] *longifolia** var. *compacta* {"Appalachian group"}

W's treatment is followed here, but further work is needed. Terrell (1996) indicated these largely central Appalachian plants could be named var. *compacta* (?= *H. geniculata* Raf. 1836, 4:102), but he ultimately combined them with the more northern var. *longifolia*. These plants tend to have "stems densely puberulent, especially near base, internodes (4-) 6-12 (-13), usually 15-40 mm long; inflorescences especially of northern and central Appalachian populations indeterminate and continuing to produce flowers into the autumn." Several of the scattered records mapped here are tentative, pending further analysis of the *longifolia* complex. Some may be transitional to (or confused with) *tenuifolia*, *canadensis*, *lanceolata* or *purpurea*.

HAB 12,10 == D? 4. **ABU** g9 s7? -2.

1389--*Houstonia longifolia* Gaertn. {Ozark-Ouachita group and transitions}

Rubiaceae <Spermacoaceae>: *Houstonia* <Amphiotis> [*Hedyotis*] *longifolia** variant {Ozark-Ouachita group and transitions}

Needing further study, these plants appear more robust and stiffly erect than typical *tenuifolia* of Appalachian regions, and perhaps part of a somewhat distinct western taxon centered in the Ozarks. They are tentatively referred to Terrell's (1996) "Ozark-Ouachita group" of *longifolia*, which he described as having "stems usually puberulent, internodes 4-7, usually longer than in the other groups (20-70 mm long); inflorescence sometimes diffuse; flowering determinate with plants flowering principally in April May and early June." However, he also noted that this group often grades into plants that resemble *tenuifolia*.

HAB 11 + B? 3. **ABU** g9? s6? -3.

1390--*Houstonia tenuifolia* Nutt.

Rubiaceae <Spermacoaceae>: *Houstonia* <Amphiotis> [*Hedyotis*] *tenuifolia* (*longifolia* var. t., ?*He. nuttalliana*)

Within *H. longifolia*, sensu lato, Terrell (1996) noted that the "*tenuifolia* group... is the most distinct group... It is a morphological extreme of *longifolia* that has long internodes (20-80 mm), linear or filiform leaves, diffuse internodes with sometimes divaricate or slightly reflexed branches and filiform pedicels to 20 mm long, short calyx lobes usually 0.5-2.0 mm long, and small capsules (1.0-) 1.5-2.5 (-3.0 mm) long." W has provided support for recognizing these plants as a species. In Appalachian regions they are relatively distinct, but in Ozarkian regions similar plants (*nuttalliana*) intergrade extensively with Terrell's (1996) "Ozark-Ouachita group" of *longifolia*. Terrell preferred to combine all these groups within *longifolia*, but did detail several segregates in addition to those known in Ky. Further analysis is needed, including re-examination of types.

HAB 11 + B 2. **ABU** g8? s8 -1.

1391--*Spermacoce glabra* Michx.

Rubiaceae <Spermacoaceae>: *Spermacoce glabra*

This decumbent perennial occurs mostly along shorelines and disturbed lowlands in the central and lower Mississippi watershed, and on the Gulf Coastal Plain. *S. glabra* is similar in general habit and morphology to the two *Diodia* species, and although treatable in distinct genera, these three species form a distinctly weedy group along the gradient from wet to dry; 2n = 28 in all.

HAB 1,2,9? ::? D 6. **ABU** g9 s8 -2?

1392--*Diodia virginiana* L.

Rubiaceae <Spermacoaceae>: *Diodia virginiana*

This prostrate annual (or perennial?) grows on shorelines and disturbed wet ground throughout most regions of the southeastern states. However, in Ky. it is uncommon to rare in more calcareous landscapes.

HAB f-2,9 ::: C 6. **ABU** g9 s9 +1?

1393--*Diodia teres* Walt.

Rubiaceae <Spermacoaceae>: *Diodia* <*Diodella*> *teres*

This annual is widespread from eastern states to tropical America, but largely restricted to open or disturbed ground on dry acid soils. Several Ky. colls. have been referred to var. *setigera* Fern. & Grisc., including some from BULL, ESTI, LETC, MCRA, METC and WAYN (B, Anderson 1947); see

also M. However, that largely midwestern taxon has not been recognized in recent treatments.

HAB F-10,12,9 :: B 6. **ABU** g9 s9 +1?

1394--Galium latifolium Michx.

Rubiaceae <Rubiaceae>: Galium latifolium

This perennial is largely restricted to somewhat mesic woods in central and southern Appalachian regions. In Ky. it is restricted to the Cumberland Mts.

HAB 5,7 C 2. **ABU** g8 s7 -1.

1395--Galium boreale L. R

Rubiaceae <Rubiaceae>: Galium boreale

This northern, circumboreal perennial was reported from Ky. by Short et al. (1833), G1 (as var. intermedium DC.), and Cr (without separation of varieties). However, no colls. have been found, and the closest verified plants are in higher mountains of W.Va. and Va. (W). G. boreale is similar to latifolium, but has smaller fruits (ca. 2 mm versus 3-4 mm), flowers white (versus purple) in rather showy cymose panicles (versus groups of 1-4 at upper 1-3 nodes), leaves lance-linear (versus lanceolate to lance-ovate) with rounded apices (versus acute to acuminate), and frequent axillary fascicles of small leaves.

1396--Galium lanceolatum Torr.

Rubiaceae <Rubiaceae>: Galium lanceolatum

This robust relative of circaezans occurs in mesic to subxeric woods of northeastern regions. In Ky. the only record from west of Appalachian regions and the adjacent Knobs is a coll. (EKY) from near Jessamine Gorge in JESS. The coll. from FLOY (KY) appears transitional to circaezans.

HAB 5,11 C 2. **ABU** g9 s8 -1.

1397--Galium circaezans Michx.

Rubiaceae <Rubiaceae>: Galium circaezans

This perennial diploid ($2n = 22$) is widespread in subxeric woods across eastern states. There are records from ADAI, OWEN, WAYN and perhaps elsewhere that may be referred to the relatively northern var. hypomaculatum Fern. However, it is not clear if this variety is worth recognizing.

HAB 11,7,5 C 2. **ABU** g10 s10 -2.

1398--Galium pilosum Ait.

Rubiaceae <Rubiaceae>: Galium pilosum

This perennial diploid ($2n = 22$) is widespread in eastern states, but largely restricted to thin woodlands and grasslands on dry acid soils. Colls. from BELL (B), LIVI (R. Athey #253) and perhaps elsewhere may be referred to the relatively southern var. punctulosum (Michx.) Torr. & Gray. Further assessment of that taxon is needed in Ky. and elsewhere (W).

HAB F-10,12 B 4. **ABU** g9 s9 -3?

1399--Galium triflorum Michx.

Rubiaceae <Rubiaceae>: Galium triflorum

This circumboreal perennial is widespread in temperate regions of North America. Variation may deserve further study; $2n = 44$ and 66 . Under typical plants, F noted "passing into" the more southern var. asprelliforme Fern., which has more paniculate inflorescences (versus axillary).

HAB 7,5,11 D 2. **ABU** g10 s10 -3.

1400--Galium concinnum Torr. & Gray

Rubiaceae <Rubiaceae>: Galium concinnum

This perennial occurs mostly in subxeric woods of midwestern regions, usually on somewhat base-rich soils.

HAB 11,5 D 2. **ABU** g9 s9 -3.

1401--Galium tinctorium L.

Rubiaceae <Rubiaceae>: Galium tinctorium (trifidum var. tinctorium)

This perennial is widespread in open wetlands of eastern North America, usually on medium acid soils. Old reports of G. trifidum L. from Ky. are referable to tinctorium (M); these species were combined in earlier treatments. Variation needs further study: var. floridanum Wieg. is a more robust southern segregate with larger fruits and leaves that has been reported from se. Ky. (Puff 1976; W). Puff elevated the two taxa to subspecies, but noted: "The separation... sometimes becomes problematic where their distribution overlaps because intergrading seems to take place." He mapped three colls. of floridanum in Ky., to the west and south, and three to the north and east.

HAB f-9,6,2 C 4. **ABU** g9 s8 -3.

1402--Galium obtusum Bigelow

Rubiaceae <Rubiaceae>: Galium obtusum

This perennial is widespread in thin swampy woods and marshy openings across eastern North America, usually on somewhat base-rich soils. If G1 is followed, most plants in Ky. are referable to the largely midwestern var. ramosum Gleason, and colls. from ADAI, LETC, JEFF (EKY) and WARR

(WKY) are the more southeastern var. obtusum. However, this distinction has not been made in recent treatments (Cr, W).

G. obtusum has often been confused with *tincorium*, but can be distinguished (F, Cr, W) by its larger flowers (4-merous versus 3-merous) and fruits (ca. 3-5 mm long versus 2-3 mm). Stems are usually more erect (versus often reclining to low and matted) and mostly glabrous (versus slightly retrorse-scabrid), except at nodes; leaves are mostly larger (ca. 1-3 cm long versus 0.5-2 cm); $2n = 48$ (versus 24).

HAB 6,9 D 3. **ABU** g10 s8 -3.

1403--*Galium divaricatum* Pourr. ex Lam.

Rubiaceae <Rubiaceae>: *Galium divaricatum* (parisiense* var. leiocarpum, in part; anglicum var. d.)

In North America, this European annual is known mostly from the Interior Low Plateaus or nearby (Cr, W; Lipscomb & Nesom 2007). It has been considered part of *G. parisiense* L., sensu lato (with $2n = 22$ to 66). Reported colls. from POWE (MICH) by Wharton (1945), and from HENR (not at KY) by Gentry (1963), are believable but need to be verified. There are also doubtful reports from WOLF and WOOD (M). It is possible that other segregates of the parisiense complex are present: *G. parisiense*, sensu stricto; and *G. anglicum* Huds. Those two taxa are known from Tenn. (Lipscomb & Nesom 2007).

ALI EU. **HAB** F-10? ::? C? 5. **ABU** +4.

1404--*Galium aparine* L.

Rubiaceae <Rubiaceae>: *Galium aparine*

This winter annual is widespread across temperate North America. There may be historical evidence and archaeological evidence (e.g. Henderson 1998) that this species is native. Gray (1864; see also F) noted: "Shaded ground, throughout the continent; probably as an introduced plant eastward." In Ky., it was first recorded early after settlement by Rafinesque and others (McMurtrie 1819), but it has generally been considered alien (Gm). Cr noted variation in chromosome number, from plants with relatively large seeds and long leaves ($2n = 44$ to 88 usually), to more depauperate plants (with $2n = 20$ usually) that are potentially segregated as var. *echinospermum* (Wallr.) Farw. However, there does not appear to have been a comprehensive study of variation within this annoying species.

ALI m. **HAB** f-8,10,7 ::? D 3. **ABU** g10 s10 +1?

1405--*Galium mollugo* L.

Rubiaceae <Rubiaceae>: *Galium mollugo*

This perennial is a widely scattered weed in northeastern regions, but uncommon to absent in southeastern states. The first record from Ky. was provided by Medley et al. (1983). *G. mollugo* is now locally abundant in low fields and stream corridors within northern counties of Ky. bordering the Ohio Rv., but it has not yet been found elsewhere. Variation needs further study (Cr, W); $2n = 22$ to 88.

ALI EU. **HAB** F-10 ::? C? 5. **ABU** +4.

1406--*Galium verum* L.

Rubiaceae <Rubiaceae>: *Galium verum*

This alien perennial is a widely scattered weed in northeastern regions, but uncommon to absent in southeastern states. It was first collected in Ky. during 1984 (M). Colls. should be rechecked against verified *G. wirtgenii* F.W. Schultz (verum ssp. *wirtgenii*), which may be difficult to distinguish in dried material (Cr, W). *G. wirtgenii* differs in its odorless, lemon-yellow flowers (versus fragrant, golden-yellow), and its more interrupted inflorescence; $2n = 22$ (versus 22 or 44).

ALI EU. **HAB** F-10 ::? D? 5. **ABU** +4.

1407--*Cruciata pedemontana* (Bellardi) Ehrend.

Rubiaceae <Rubiaceae>: *Cruciata* [*Galium**] *pedemontana*

The first North American records of this European annual were from Ky. ca. 1940 (Bartholomew 1941). Since then it has spread steadily into grassy places across most of the state, especially the Bluegrass region. It is also widely scattered in other east-central states (PL). Distinction of *Cruciata* from *Galium* is well founded (W); $n = 9$ versus $n =$ usually 11.

ALI EU. **HAB** F-10,12 :: D 5. **ABU** +5*.

1408--*Sherardia arvensis* L.

Rubiaceae <Rubiaceae>: *Sherardia arvensis*

This Mediterranean annual weed is now widely scattered across southeastern states, especially in frequently mowed areas. The first record from Ky. was provided by Browne & Athey (1978). This monotypic genus shares several features with *Galium*; $2n = 22$.

ALI EU. **HAB** S-10 ::: C 6. **ABU** +5.

1409--*Sabatia campestris* Nutt.

Gentianaceae: *Sabatia campestris*

This annual occurs from the lower Mississippi Valley to Tex.; $2n = 26$. A coll. from CALL (MUR) is verified, with accession number 558 but the collector's name lacking: 20 June 1940, from "Kentucky Wildlife Refuge" [presumably along the Tennessee Rv. before impoundment]. It was initially determined as *S. angularis*.

HAB 10 ::? D? 5. **ABU** g8 s2 -6.

1410--*Sabatia campanulata* (L.) Torr.

Gentianaceae: *Sabatia campanulata* (*gracilis*)

In Ky. this southeastern perennial is restricted to a few seasonally wet meadows on acid soils of high terraces among the eastern Knobs and on the southern Appalachian (Cumberland) Plateau. Habitat has been destroyed at several sites, and none of the few remaining sites for this species or its associated vegetation are protected. Efforts to propagate this species from seed have failed.

HAB 9 ::? A 5. **ABU** g8 s2 -6.

1411--*Sabatia brachiata* Ell.

Gentianaceae: *Sabatia brachiata*

This biennial is closely related to *angularis*, but more concentrated on the southeastern Coastal Plain, especially on acid sandy soils (Cr, W). It has narrower leaves (l/w ca. 2.5-4 versus 1.5-3), broadest near the middle above the tapered base (versus near the rounded-subcordate base); also, stems are not winged below the middle (versus winged); flowers tend to be smaller and less numerous; $2n = 32$ versus 38. A patch of about 30 plants was discovered in 1994 by J. Kiser (KY), on a roadside by the large powerline on uplands at Duck Run in se. MCRE. Some plants had white flowers. These have not reappeared in recent years; fire or soil disturbance is probably required to allow fresh establishment, but mowing has been excessive.

HAB 10 ::? A? 5. **ABU** g8 s2 -5.

1412--*Sabatia angularis* (L.) Pursh

Gentianaceae: *Sabatia angularis*

This biennial has a broad southeastern range, but, at least within the Ohio Valley, it is uncommon to absent in calcareous regions.

HAB f-10,7,9 ::? C 5. **ABU** g9 s9 -2.

1413--*Gentiana saponaria* L.

Gentianaceae: *Gentiana saponaria* (?*cherokeensis*)

This is a variable species, distributed widely across southeastern states, usually in thin swampy woods and brushy wet meadows on medium acid soils. Pringle (1967) and other have found that occasional hybrids of *andrewsii* and *puberulenta* resemble *saponaria*, but he considered it unlikely that *saponaria* originated from such hybridization.

HAB r-9,6 C 4. **ABU** g9 s8 -3.

1414--*Gentiana cherokeensis* (W.P. Lemmon) Fern. T

Gentianaceae: *Gentiana cherokeensis*

This southern Appalachian taxon has unusually narrow leaves and deeper blue flowers (F). It has generally been combined with *saponaria* (Pringle 1967), but may deserve some distinction (W). E.L. Braun wrote "*cherokeensis*" in her catalog at US for coll. #4885 from MCRE (near Yamacraw at Big South Fk.), but that coll. cannot now be found at GH or US.

1415--*Gentiana andrewsii* Griseb.

Gentianaceae: *Gentiana andrewsii*

This is largely midwestern species of damp soils, but it ranges widely across northern states and adjacent Canada, extending south to near the Ky. line in W.Va., Ohio, Ind., Ill. and Mo. (K). *G. andrewsii* may intergrade with *saponaria* and *puberulenta* to a limited extent (Cr, Pringle 1967); see det. of J.S. Pringle at Field Museum and elsewhere. It has been recently collected from CAMP in wet woods along the Ohio Rv. (KNK, Naczi et al. 2002).

Older records (M) are based on misidentified *saponaria* (ADAI & TAYL at Field) or remain doubtful. There are colls. of *andrewsii* by C.W. Short (GH, PH) that may be from Ky. but with uncertain provenance; the coll. at GH is mounted on the same sheet as a coll. of *saponaria*, which is labelled "banks of the Ohio River, Ky., Oct 1842". However, it is unclear if the *andrewsii* came from the same location. See also notes under *puberulenta*.

Another northern gentian of damp sites, *Gentianopsis crinita* (Frölich) Ma, was reported from Ky. by Gray (1864), but no coll. has been located and the record did not become accepted (F, K, M).

HAB 9,6 C? 4. **ABU** g9 s2 -5?

1416--*Gentiana decora* Pollard

Gentianaceae: *Gentiana decora*

This is restricted to southern Appalachian regions at upper elevations. In Ky. it is restricted to the Cumberland Mts., where it mostly occurs along or near trails.

HAB r-7,8,11,12? A 4. **ABU** g7 s5 -2.

1417--*Gentiana puberulenta* J. Pringle

Gentianaceae: *Gentiana puberulenta* ("puberula")

This largely midwestern species occurs only in scattered remnants of native grassland, and has become rare across much of its range. In Ky. most records date from before 1950, and they are clustered in or near the western karst plains, especially near Mammoth Cave and in other land between the karst plain and the Shawnee Hills. Despite much searching, the only well-documented extant population is in HARD (KY), where management with fire has allowed recovery in a more natural area.

G. puberulenta has a curious, tortuous nomenclatural history in Ky. and elsewhere. It became widely known as *G. puberula* Michx. after Gray's (1864) early floras, but Pringle (1966, 1967) considered that Michaux's (1803) type (from s. Ill.) is really an unusual puberulent coll. of *saponaria*, and he established the current name instead. Hybrids between these two species are rare, but Pringle found that hybrids of *puberulenta* and *andrewsii* can resemble *puberulenta*.

C.S. Rafinesque probably included *puberulenta* in his colls., but none of his epithets became recognized for species of *Gentiana*. It is likely that Raf. was referring to this species in one of two names: "shortiana... common in the glades of Kentucky, Tennessee, Illinois, &c."; and his "torreyana... In the glades with the foregoing..." (Merrill 1949, and citations). Those two taxa were almost the only species that Rafinesque named in honor of Short or Torrey! C.W. Short himself provided the earliest clear record of *puberulenta* from Ky., under the misapplied name *G. rubricaulis* Schwein., with a coll. from "Barrens of Ky. Sept. 20th 1835 near Mammoth Cave" (NCU, PH; see also, Short & Peter 1835).

HAB 10,12 D 5. **ABU** g7 s2 -5.

1418--*Gentiana villosa* L.

Gentianaceae: *Gentiana villosa* (*ochroleuca*)

This occurs widely across southeastern states, usually in submesic woods on acid soils. Of all *Gentiana* species in eastern North America, it is the most typical of deeper woods; $2n = 36$ versus 26 in most or all others, and hybrids

are virtually unknown. Corollas are usually whitish at first with green veins, but often become flushed with purple and then can be confused with other species.

HAB 7,8,10 B 3. **ABU** g8 s8 -2.

1419--*Gentiana alba* Muhl. ex Nutt.

Gentianaceae: *Gentiana alba* (*flavida**)

This largely midwestern species occurs in remnants of native grasslands, typically on damper sites than *puberulenta* (perhaps with more clay and less sand). Hybrids with *puberulenta* have occasionally been found in other states (Pringle 1967). For over a century, there has been controversy about the nomenclatural validity of *alba* versus *flavida* as the epithet, which still needs to be resolved (Wilbur 1988, W).

In Ky. *alba* is endangered. There have been a few reports during recent decades, especially in the eastern Knobs and Blue Licks area; the species is also known in s Ohio. But more verification is needed in most cases, with photos or colls. (including several reports to M and NP). *G. villosa* has sometimes been misidentified as *alba*. Before B's coll. in the 1930s from "prairie patches" of Clack Mt. in ROWA, the only record from Ky. was in the unverifiable list of McMurtrie (1819). There is no evidence that Short et al. (1833-40) ever found this species.

The southern limit of this species needs clarification. Records of *alba* that are mapped by NP (see also K) from w. Ky. in BUTL, LOGA and WARR remain dubious. There are no known colls. from the broadly defined "Big Barrens" region of Ky. and Tenn. However, *alba* is well-known from a few counties along the Ohio Rv. in s. Ind. (D) and s. Ill. (ML).

HAB 10,9 D 5. **ABU** g8 s2 -5.

1420--*Gentianella quinquefolia* (L.) Small

Gentianaceae: *Gentianella* [*Gentiana*] *quinquefolia*

This biennial occurs widely on base-rich soils in east-central states, but it is generally uncommon and its range is somewhat fragmented (K). The three clusters of records within Ky. are intriguing: (1) on the western edge of the southern Cumberland Plateau (extending south into Tenn.); (2) in the western Knobs and adjacent karst plain (extending north into Ind.); (3) in or near the eastern Knobs (extending north into Ohio).

Most or all *Gentianella* in Ky. seems to be var. *occidentalis* (Gray) Small, but further review of colls. is needed (F, Cr, W). Var. *occidentalis* occurs mostly in the upper midwest, while typical *quinquefolia* occurs mostly in Appalachian regions; reportedly, $2n = 38$ in both.

HAB r-10,12,7 D 4. **ABU** g8 s7 -4.

1421--*Frasera caroliniensis* Walt.

Gentianaceae: *Frasera* (*Swertia*) *caroliniensis*

This extraordinary monocarpic perennial ranges widely across east-central states but it is only locally abundant, usually in thin woods on seasonally dry base-rich soils. When flowering, it is by far the tallest species of Gentianaceae in eastern North America, at ca. 1-2 m; $2n = 78$. Threadgill et al. (1981) showed that rosettes live for years or decades before flowering, which occurs after a minimum size is reached.

HAB 11,8,7 E 3. **ABU** g9 s8 -2.

1422--*Bartonia virginica* (L.) B.S.P.

Gentianaceae: *Bartonia virginica*

This slender mycotrophic annual is widely scattered across eastern North America but largely restricted to seasonally wet open areas on strongly acid boggy soils. It appears to intergrade with *paniculata* at the Hazel Dell site in PULA, and occasional intermediates are reported in other states (Gillett 1959); $2n = 52$ in both species.

HAB 9,10 ::? A 5. **ABU** g10 s4 -4.

1423--*Bartonia paniculata* (Michx.) Muhl.

Gentianaceae: *Bartonia paniculata*

This has range and habitat similar to *virginica*, but typically occurs in more woody vegetation with some shade.

HAB 9,6 ::? A 3. **ABU** g9 s7 -3.

1424--*Obolaria virginica* L.

Gentianaceae: *Obolaria virginica*

This mycotrophic perennial is widely distributed across southeastern states. *Obolaria* (a monotypic genus) usually occurs in somewhat mesic woods, which is unusual for Gentianaceae, and it is the smallest member of the family in eastern North America; $2n = 56$.

HAB 7,5 ::? C 1. **ABU** g9 s9 -2.

1425--*Spigelia marilandica* (L.) L.

Loganiaceae: *Spigelia marilandica*

This southeastern perennial typically occurs in thin woods on dry base-rich soils.

HAB 7,11 D 3. **ABU** g9 s8 -2.

1426--*Vinca minor* L.

Apocynaceae: *Vinca minor*

This low evergreen creeper from southern Europe spreads vegetatively from plantings, but establishment from seed is not documented in Ky. Although cultivated here since early settlement (Gm), it was not properly documented as an escape until the 1930s (B). It is sometimes abundant over several acres in and around old cemeteries.

ALI EU. **HAB** 7,5,11 D 1. **ABU** +5*.

1427--*Vinca major* L. C

Apocynaceae: *Vinca major*

This robust relative of *minor* has similar original range in southern Europe, but not extending as far north. *V. major* has been widely grown and locally naturalized in southeastern states, but in most of Ky. it is not hardy enough for horticultural use. Gm noted "not often seen" in 1914; there are more recent colls. from CALL (MUR) and perhaps CHRI (M). But it is not clear if these records represent real spread into wild vegetation.

ALI EU.

1428--*Thyrsanthella difforme* (Walter) Pichon

Apocynaceae: *Thyrsanthella* ["*Trachelospermum*"] *difforme*

This southeastern vine occurs in damp soil along shorelines of various types, from stagnant sloughs to rocky riverbanks. Although reportedly "high climbing" in warmer states, it is generally no more than 1-2 m tall and barely woody in Ky. Reassignment of this species from *Trachelospermum* to the monotypic genus, *Thyrsanthella*, is supported by global analysis of Apocynaceae (Livshultz et al. 2007). *Trachelospermum* is largely East Asian.

HAB 1,2,6 ::? C 3. **ABU** g10 s7 -2?

1429--*Apocynum cannabinum* L.

Apocynaceae: *Apocynum cannabinum* (var. c.)

This is a common weed in eastern and central states. Records mapped here include var. *glaberrima* A. DC. and var. *pubescens* (Mitchell ex R. Br.) Woods, which are not generally recognized in recent treatments. There are

also a few records of hybrids with *sibiricum* or *androsaemifolium*; $2n = 16$ in all three taxa. See notes under those names.

HAB F-10,1 D 5. **ABU** g10 s10 +2?

1430--*Apocynum sibiricum* Jacq.

Apocynaceae: *Apocynum sibiricum* (cannabinum* var. *hypericifolia*)
This has often been treated as a distinct northern species (e.g. F, W), but there may be some intergradation with typical *cannabinum* along its southern borders, and specimens are often impossible to assign (Y). Variety status is often preferred (Cr) or even complete combination (Y, J). Colls. often lack middle stem leaves, which have characteristically short petioles (ca. 0-3 mm versus 5-10 mm) and rounded to cordate bases (versus cuneate to rounded).

HAB F-10? C? 5. **ABU** g10 s5? -1?

1431--*Apocynum* ×*floribundum* Greene (pro sp.)

Apocynaceae: *Apocynum androsaemifolium* x *cannabinum* (X *floribundum*, medium)

Plants mapped appear to be largely of hybrid origin but may include a few more or less pure plants of *androsaemifolium*. The latter ranges widely over northeastern and western North America, but tends to occur in more woody habitats. It extends south in or near the higher Appalachians to c. Ga. (W).

There are a few records of pure *A. androsaemifolium* L. from ROWA (MDKY; Campbell et al. 1992) and perhaps elsewhere. Gm stated of it: "not uncommon about meadows and in open woodland in western Ky."

HAB f-8,7,12? D? 4. **ABU** g10? s5? -3?

1432--*Amsonia tabernaemontana* Walt.

Apocynaceae: *Amsonia tabernaemontana* (var. t.)

This southeastern species has a generally abrupt northern limit. The disjunct coll. from JEFF (DHL) may be from a cultivated plant. Treatment of *tabernaemontana* and its segregates remains uncertain ($2n = 16, 22, 32$); see notes under *salicifolia*.

HAB 7,4,5 C 3. **ABU** g8 s8 -3.

1433--*Amsonia salicifolia* Pursh

Apocynaceae: *Amsonia salicifolia* (*tabernaemontanum** var. s. and *gatteringeri*)
This southeastern taxon is generally distinct from typical *tabernaemontanum* in its denser inflorescence, narrower leaves (ca. 1-3 cm wide versus 3-6 cm), denser clonal growth, and preference for more sunny conditions. Differences are clear in cultivated plants grown side by side.

The name *A. tabernaemontanum* var. *gatteringeri* Woodson has been applied to plants of the Interior Low Plateaus (especially along rivers) that differ from *salicifolia* in their more pubescent, greener lower leaf surfaces (versus glabrous, glaucous), and denser inflorescences (F, W). Such plants include colls. from HOPK (KY), MCRA (NCU) and perhaps elsewhere, but there is not enough information to justify general recognition in Ky. (see also Y).

The largely Ozarkian *A. illustris* Woodson is a more distinct taxon in this complex (Y). *A. illustris* is widely cultivated but may be native to riverbanks in c. Tenn., where perhaps indistinguishable from *gatteringeri* (D. Estes, pers. comm.). Not mapped here are colls. from CAMP (KNK, NCU) initially referred to *illustris*, which were probably spread from cultivation; their identify and provenance remain uncertain.

HAB r-9,1? C 5. **ABU** g8? s5? -4.

1434--*Asclepias exaltata* L.

Asclepiadaceae [Apocynaceae]: *Asclepias exaltata* (phytolaccoides)
This occurs in northeastern and Appalachian regions, usually in relatively mesic woodlands and edges.

HAB 8,7,5 C 3. **ABU** g9 s7 -3.

1435--*Asclepias purpurascens* L.

Asclepiadaceae [Apocynaceae]: *Asclepias purpurascens*
This is widely scattered over eastern states, but it is rare in southern regions of its range and virtually absent on the Coastal Plain (W). It may have been most frequent in thin woods and edges on fertile, submesic lowlands and terraces, now increasingly influenced by agriculture and colonized by the more weedy, closely related species, *syriaca*; hybrids are known (Y). In 1914, Gm noted that *purpurascens* was "common on low ground, along streams and ditches." But it can also occur on seasonally dry uplands. Since 1980, it has been found in Ky. (pers. comm.) by D. Boone & R. Cassell on roadsides north of Mammoth Cave (EDMO/HART); by D. White along a trail at Big Bone Lick (BOON); and by D. Estes along a road in MCRE. In 30 years of field work in the state, JC and MM have recognized this species on only two or three occasions.

A. purpurascens differs from *syriaca* in its smooth fruits (versus muricate), its more deeply purplish flowers, which have hoods without distinct lateral lobes, and its generally fewer umbels. Also, its leaves are more densely

puberulent below ("velvety-downy" versus "grayish-tomentose"), more glossy above, and generally narrower (F, Cr, W).

HAB r-10,9,8,6? D? 4. **ABU** g8? s4? -4.

1436--*Asclepias syriaca* L.

Asclepiadaceae [Apocynaceae]: *Asclepias syriaca* (intermedia)

Although common across northeastern states, this weedy species has a rather abrupt southern limit across Ky. and Tenn. In the Mississippian Embayment, and even in the southern Interior Low Plateaus of Tenn., Ala. and Ga., it is rare to absent. It can cross with some other *Asclepias* species (as reviewed by Y); $2n = 22$ in most or all species of Ky. However, no hybrids have been documented in the state.

HAB R-10 ::? D 6. **ABU** g10 s10 +3.

1437--*Asclepias quadrifolia* Jacq.

Asclepiadaceae [Apocynaceae]: *Asclepias quadrifolia*

This ranges across east-central states, usually in somewhat subxeric woods on base-rich soils.

HAB 11,5,7 D 3. **ABU** g9 s9 -2.

1438--*Asclepias variegata* L.

Asclepiadaceae [Apocynaceae]: *Asclepias variegata*

This is widely distributed across southeastern states but generally restricted to dry acid soils in thin woods and edges.

HAB r-10,7,11 B 3. **ABU** g9 s8 -2.

1439--*Asclepias sullivantii* Engelm. ex Gray R

Asclepiadaceae [Apocynaceae]: *Asclepias sullivantii*

This midwestern prairie species is unlikely in Ky., but there are one or two colls. that have been reported with this name (M). B's coll. from HARD (US) was redet. as *viridiflora*.

1440--*Asclepias perennis* Walt.

Asclepiadaceae [Apocynaceae]: *Asclepias perennis* (parviflora)

This southeastern species occurs mostly in thin swampy woods.

HAB 9,6 D? 3. **ABU** g8 s8 -3.

1441--*Asclepias incarnata* L.

Asclepiadaceae [Apocynaceae]: *Asclepias incarnata*

This is widespread in open wetlands across eastern and central North America, usually on somewhat base-rich soils. In Ky. some colls. from HICK, ROWA and probably elsewhere may be referable to var. *pulchra* (Ehrh. ex Willd.) Pers., which was treated as a ssp. by Woods. However, more work is needed to determine if that northeastern taxon of more boggy soils can be consistently distinguished within the state. It is more hairy; leaves are broader; and plants are less branched (W).

HAB f-9,2 D 5. **ABU** g10 s10 -2?

1442--*Asclepias amplexicaulis* Sm.

Asclepiadaceae [Apocynaceae]: *Asclepias amplexicaulis*

This is widely scattered over eastern states but largely restricted to open areas on dry acid soils.

HAB f-10,7,12 B 4. **ABU** g10 s7 -4.

1443--*Asclepias verticillata* L.

Asclepiadaceae [Apocynaceae]: *Asclepias verticillata*

This is widely scattered over eastern and central states, but generally restricted to remnants of native grassland on dry base-rich soils. A few records may represent adventive plants along roadsides (e.g. in WOOD).

HAB f-12,10 D 5. **ABU** g10 s8 -3.

1444--*Asclepias tuberosa* L.

Asclepiadaceae [Apocynaceae]: *Asclepias tuberosa* (+ var. *interior*)

This is widespread across eastern and central states. Most Ky. plants appear at least transitional to be the western var. *interior* (Woods) Shinnery. But colls. that are closer to the more eastern var. *tuberosa* are also scattered widely over the state. These taxa may not be worth separating in Ky., but see Y to west and W to east; they often been treated as subspecies. Woodson's research (culminating in 1964) indicated that distinction of these taxa became reduced due to migration and mixing along roadsides during the 20th Century.

HAB f-10,12,8 C 5. **ABU** g10 s10 -2?

1445--*Asclepias viridis* Walt.

Asclepiadaceae [Apocynaceae]: *Asclepias* <*Asclepiodora*> *viridis*

This occurs mostly in the central and lower Mississippi watershed, and along the Gulf Coast. It typically occurs in grazed or mowed grassland on dry base-rich soils.

HAB F-10,12 ::? E 5. **ABU** g10 s8 -3?

1446--*Asclepias viridiflora* Raf.

Asclepiadaceae [Apocynaceae]: *Asclepias* <*Acerates*> *viridiflora*

This is centered in the Great Plains but extends into the rocky glades of east-central states, especially on xeric base-rich soils.

HAB 12 E 5. **ABU** g9 s8 -3.

1447--*Asclepias hirtella* (Pennell) Woods.

Asclepiadaceae [Apocynaceae]: *Asclepias* <*Acerates*> *hirtella* (*longifolia* var. h.)

Typical *hirtella* is centered in the upper midwest, and occurs mostly on drier ground, often with calcareous soil. The closely related *A. longifolia* Michx. has been reported from Ky. (BA) but not verified; it occurs mostly in wet pine savannas on the Coastal Plain in southeastern states (W). Plants named *hirtella* on seasonally wet acid soils in PULA (BEREA), with disjunct *Gymnopogon brevifolius*, also typical of wet pine savannas, should be rechecked for possible integration with *longifolia*. The Ozarkian relative, *A. stenophylla* Gray, has also been reported (BA) but apparently in error (M).

HAB 9,10,12? C? 5. **ABU** g8 s4 -5.

1448--*Cynanchum laeve* (Michx.) Pers.

Asclepiadaceae [Apocynaceae]: *Cynanchum* (*Ampelamus**) *laeve* (*A. albidus**)

This is a widespread herbaceous vine in southeastern states, most common on fertile base-rich soils. There has been continuing uncertainty about its generic assignment (W).

HAB R-8,10,7 D 4. **ABU** g9 s9 +2?

1449--*Cynanchum louiseae* Kartesz & Gandhi C

Asclepiadaceae [Apocynaceae]: *Cynanchum* (*Vincetoxicum*) *louiseae* ("nigrum")

There is little evidence that this occasionally cultivated Mediterranean vine is truly naturalized in the Ohio Valley or central Mississippi Valley, but records are scattered widely across northeastern regions (PL). In Ky. it is known from only one coll., from a "dry roadside thicket at Lake Louisville" in 1957 (JEFF at DHL).

ALI EU.

1450--*Matelea obliqua* (Jacq.) Woods.

Asclepiadaceae [Apocynaceae]: *Matelea obliqua* (*Gonolobus* o.; ?*G. shortii*)

This is a fairly widespread species of calcareous soils in east-central states. It has generally been combined with the Appalachian *Gonolobus shortii* (Gray) Gray, but further study is needed. There are rather few good colls. of *Matelea* (or *Gonolobus*) from Ky., and they have often been damaged by insects in our herbaria. *G. shortii* has been recorded from JESS (Gm), LEWI (MDKY), ROWA (B) and elsewhere.

Compared to typical *obliqua*, *shortii* has been distinguished (F) by its longer (13-15 mm versus 6-12 mm), broader (2-2.5 mm versus 1.5-2) corolla lobes, which are dark "chocolate-purple" (versus greenish-fuscous outside, purple inside); also, the crown is reportedly thinner (Gray 1889). *G. shortii* suggests a transition to *decipiens*.

HAB 8,11,7 E 4. **ABU** g8 s8 -3.

1451--*Matelea decipiens* (Alexander) Woods. R

Asclepiadaceae [Apocynaceae]: *Matelea decipiens* (*Gonolobus* d.)

This species of base-rich soils in the mid-south (S.C. to Okla.) has been reported from Ky. (including CARL, MARS and WARR) based on colls. of R. Athey and M. Medley, but it is not yet verified (M). Identification has been difficult due to inadequate colls. and varied treatments, with *obliqua* often confused; figures of flowers appear switched in G1 but not corrected in Holmgren et al. (1998).

Based on more reliable treatments (perhaps F and Y), the corolla lobes of *decipiens* are usually brownish-purple to almost black (versus usually paler in *obliqua*), (7) 10-18 mm long and 3-6 mm broad, widest at or above the middle (versus more linear), with l/w ca. 2-4 (versus 4-6). See further notes under *obliqua*.

HAB 8,7,6? E? 4. **ABU** g8 s4? -5.

1452--*Matelea carolinensis* (Jacq.) Woods.

Asclepiadaceae [Apocynaceae]: *Matelea carolinensis* (*Gonolobus* c.)

There have been few reports of widespread southeastern species from Ky. and some of these remain unverified. *M. caroliniana* is close to *decipiens* and intermediates have been reported further south. It may be less concentrated on base-rich soils but still "nutrient-rich" (W).

Compared to *decipiens*, corolla lobes of *carolinensis* are shorter (usually 7-12 mm versus 11-15 mm), broader (40-50% as long versus 25-33%), and rotate (versus ascending); buds are bluntly ovoid (versus oblong-conical). In

both species, corolla lobes are widest at or above the middle (versus tapering from the base to an acute apex in obliqua), and the crown is thin, with alternate lobes prolonged into acute or acuminate tips (versus fleshy, with lobes all truncate or emarginate in obliqua).

HAB 8,10,7 C? 4. **ABU** g10 s4? -3?

1453--Gonolobus suberosus var. granulatus (Scheele) Krings & Q.Y.

Xiang

Asclepiadaceae [Apocynaceae]: *Gonolobus* [Matelea*] *suberosus* var. *granulatus* ("gonocarpus"*)

This is centered in the lower Mississippi Valley and Gulf Coastal Plain, but has been submerged within the more southeastern *G. suberosus* (L.) Ait. in most past treatments. Typical *suberosus* (= *Vincetoxicum gonocarpos* Walt.) is not known definitively from Ky., although Kriangs (2006) cited a coll. of a transplant from JESS to the Univ. of North Carolina in 1963. There is an abrupt shift between the two taxa from the Interior Low Plateaus to the Ridge-and-Valley, with no proven overlap but molecular data suggests incomplete genetic separation.

Based on recent analysis (Krings & Xiang 2005), *granulatus* should be recognized at least as a variety. It differs from typical *suberosus* in its uniformly olive-green to orange corolla lobes, on fresh upper surfaces (versus multi-colored, generally dark maroon to brownish near the base and green to yellowish near the tips). Also, laminar dorsal anther appendages are yellow, with apex rounded or truncate (versus dark purplish or maroon-tinted, with apex bilobed to emarginate).

See Y and W for recent taxonomic review at genus and species level. In addition to clear differences from *Matelea* in fruits and flowers, *Gonolobus* tends to be less hairy (with sparse versus moderate to dense hairs on lower leaf surfaces), and leaves tend to have narrower shape (oblong-ovate to broadly ovate versus ovate to suborbicular).

HAB 8,7,6? D? 3. **ABU** g8 s8 -3.

1454--Ligustrum ovalifolium Hassk. T

Oleaceae: *Ligustrum ovalifolium*

Although often called "California privet" this shrub is native to Japan. There are purported colls. from FAYE (KY), FRAN (EKY), LAWR (EKY) and MADI (BEREA); see also Gm and CW. However, distinction of *ovalifolium* from other species needs further study, as well as the extent to which it is truly

naturalized. It is similar to *sinense* but has glabrous, glossy branchlets; leaves tend to be larger and more narrowed at base; flowers are said to be irritably fragrant.

ALI AS.

1455--Ligustrum obtusifolium Sieb. & Zucc.

Oleaceae: *Ligustrum obtusifolium* (var. o.)

Mapping here is provisional. This Japanese species was first recorded from Ky. by Woodward (1967), and most records come from the recent work of CW. It has often been confused with other species, including *amurense*. Some of the colls. mapped here may also refer to the popular hybrid with *ovalifolium* known as "Ibodium Privet" (*X ibodium* Coe), which has been grown in Ky. (perhaps including "ibota" of Gm).

Compared to *sinense* and *vulgare*, typical *obtusifolium* has relatively long corolla tubes (ca. 2-3 x lobes versus 0.8-1.2). Inflorescences are relatively short (1.5-4 cm versus 3-11 cm) and dense, but showy and early. Leaves tend to be narrower (l/w mostly ca. 2.5-3 versus 2-2.5) and more deep glossy green.

ALI AS. **HAB** f-8 E? 3? **ABU** +4.

1456--Ligustrum amurense Carr. R

Oleaceae: *Ligustrum amurense* (*obtusifolium* var. *suave/a.*)

This shrub from northern China is closely related to *obtusifolium* and may be combined as var. *suave* (Kitagawa) H. Hara. It is less hairy, and has shorter corolla tubes (W). Colls. have been provisionally identified from BARR (WKY), CART (MDKY), WARR (WKY) and WAYN (MM for WKY). However, CW did not verify any naturalized plants in Ky.

ALI AS. **HAB** f-8 C? 3? **ABU** +4.

1457--Ligustrum sinense Lour.

Oleaceae: *Ligustrum sinense*

During recent decades, this Chinese species has rapidly become the most abundant species of *Ligustrum* across southeastern states (Ch, W). It was first reported from Ky. by Browne (1967), much later than *vulgare*, but it has now become more common in some regions, especially to the south. Most records in Ky. come from the recent work of CW.

L. sinense has been much confused with *vulgare*. Its leaves tend to be more ovate (widest below the middle versus more or less elliptic), less acute (often

obtuse or retuse versus often slightly acuminate), less rigid, and more hairy below on the mid-vein (versus mostly glabrous). Twigs tend to be more pubescent (in density or hair length). Panicles tend to be longer (ca. 4-11 cm versus 3-6 cm) and more open. Corolla tubes are relatively short, often barely exerted from the calyx (versus distinctly exerted), and often allowing anthers to be more exerted (versus included).

ALI AS. HAB f-8,7 D? 3. **ABU** +5*.

1458--Ligustrum vulgare L.

Oleaceae: Ligustrum vulgare

This shrub from southern Europe is widely naturalized in North America, but concentrated in humid mid-temperate regions to the north of sinense (K). In Ky. vulgare was first planted for ornamental hedges a century ago or more (Gm), and it became locally naturalized. Some colls. should be rechecked for related species that have been more recently introduced; see especially notes under sinense.

ALI EU. HAB f-8,7 D? 3. **ABU** +5*.

1459--Syringa vulgaris L. C

Oleaceae: Syringa vulgaris

This favorite ornamental shrub from southeastern Europe is widely naturalized in northeastern states and adjacent Canada. In Ky. is frequently planted, and can persist at old-home sites, but seedlings have not been found; CW mapped it in CALL, LEWI, SHEL and WOLF.

ALI EU.

1460--Chionanthus virginicus L.

Oleaceae: Chionanthus virginicus

This small tree species is widely scattered over southeastern states, but it is most common in Atlantic states and rare to absent in the central and lower Ohio Valley (K). In Ky. it occurs mostly on or near cliffs and rocky riverbanks, usually on medium-acid well-drained soils. Populations are generally thin, with mature individuals often separated by 100-1000 m.

C. virginicus is sometimes confused with the East Asian species, C. retusus Lindl. & Paxton, which is a popular cultivated ornamental that can become invasive (Dirr 1997; Flora of China Vol. 15; R. Olsen, pers. comm.). Panicles of retusus are on leading shoots (versus lateral branches), tend to be smaller (ca. 3-12 cm long versus 10-25 cm long), and usually appear in May about 2-3 weeks earlier than virginicus; its fruits are smaller (ca. 1-1.5 cm long versus

1.5-2 cm). Leaves of retusus typically tend to be smaller (ca. 3-12 x 2-6.5 cm versus 7-20 x 2.5-10 cm), broader in shape, more lustrous dark-green above and more uniformly pubescent below. However, there is much variation in leaves of both species; a global revision is still needed.

HAB 12,11,1,9? + C 4. **ABU** g9 s8 -2.

1461--Forsythia suspensa (Thunb.) Vahl C

Oleaceae: Forsythia suspensa

This commonly cultivated species sometimes persists at old home sites, but it has generally spread into the wild. There are colls. of this species or the closely related F. viridissima Lindl. from persistent or escaped plants in BALL, DAVI, JEFF, LYON, MCRE and TRIG (M, CW; APSU).

ALI AS.

1462--Forestiera acuminata (Michx.) Poir.

Oleaceae: Forestiera acuminata

This large shrub of southeastern states is restricted to swampy woods and thickets, usually on base-rich clayey soils.

HAB 2,3 E? 4. **ABU** g8 s8 -2.

1463--Forestiera ligustrina (Michx.) Poir.

Oleaceae: Forestiera ligustrina

This shrub is centered on the Gulf Coastal Plain, Ozarks and southern Interior Low Plateaus, usually growing in thin woods and thickets on dry calcareous soils. It is probably the plant Rafinesque (1836, 3:92) described as Nudilus paradoxus: "from West Kentucky to Texas, very rare, a small shrub 3 to 5 feet high..."

HAB 12,11,7? E 4. **ABU** g7 s4 -3.

1464--Fraxinus quadrangulata Michx.

Oleaceae: Fraxinus <Dipetalae> quadrangulata

This highly distinct species of ash (Wallender 2008) occurs on calcareous soils across east-central states, with some more or less disjunct sections in its range (Little 1971; PL). Its flowers are perfect, in contrast to other eastern species, which are largely dioecious. A blue dye was made from its bark in olden times, but no analysis of the chemistry has been published. Horses often nibble the bark in woodland pastures of the Bluegrass region, but generally refrain from complete consumption of the cambium. Initial experiments with the Emerald Ash Borer in Ohio have shown that quadrangulata may be the

only eastern ash with some significant resistance to this pest (D. Herms, pers. comm.).

HAB 11,7,12 E 2. **ABU** g9 s8 -3.

1465--Fraxinus nigra Marsh. R

Oleaceae: Fraxinus <Fraxinus> nigra (sambucifolia)

Short (1828), Gray (1878-86) and others reported this northeastern tree from Ky. during 1770-1860 (GI, M; Campbell 1989). But only one coll. has been located, and it is not clear if this was from a wild or cultivated tree: J.S. Terrill, 7 Sep 1893, from "Lexington" in FAYE (KY). *F. nigra* still occurs within 5-50 miles of the state line in s. Ind., s. Ohio (where discovered recently by D. Boone on a seeping base of Indian Hill in Hamilton Co.), and w. Va (D, Braun 1961, Little 1971, HW+).

F. nigra is closely related to, and sometimes confused with, the European *F. excelsior* L. (Wallender 2008), which is sometimes cultivated in northeastern states but rarely if ever escapes (F, Cr, W). Both species have short flattened samaras, no calyx, sessile leaflets and blackish buds. Leaflets of *excelsior* are less hairy at their bases (versus densely covered with rusty hairs at junctions with rachis); terminal buds are usually deeper black, more rounded and adjacent to the upper pair of lateral buds (versus distinctly separated); twigs are slightly 4-angled (versus terete), and petiole bases are raised (versus flush with twigs), leaving more or less semicircular scars (versus suborbicular). Both species are diploids ($2n = 46$), but hybrids have not been reported. The more closely related East Asian species, *F. mandschurica* Ruprecht, has also been planted in cooler regions of North America, including selected cultivars and hybrids with *nigra*.

1466--Fraxinus pennsylvanica Marsh. var. subintegerrima (Vahl) Fern.

Oleaceae: Fraxinus <Melicoides> pennsylvanica var. subintegerrima (lanceolata)

This diploid species ($2n = 46$) ranges widely across eastern North America and into the Great Plains. Its leaves vary much in size, shape, serration, pubescence, and length of petiolules, but the taxonomic significance remains uncertain (Cr, Nesom 2010b). Trees mapped here with largely glabrous leaves and twigs are much more common than hairy ones in Ky., especially in riparian zones and nearby sloughs. Open dots mapped here indicate colls. of the species, but with uncertain assignment to variety.

Cultivars from western states, especially the largely male "Marshall's Seedless" from Utah, have been widely planted in developed areas of eastern states within the past 50 years but tend to grow poorly in southeastern states (Stoutamire & McArdle 1983; Gilman & Watson 1993). Leaflets of trees like Marshall's Seedless clearly differ from var. subintegerrima of east-central states in their shorter petiolules (0-2 mm versus 1-12 mm) and deeper serration (ca. 0.5-1 mm versus 0-0.5 mm); also, they tend to be fewer (mostly 5-7 versus 7-9), smaller and often broader in shape. Their occasional samaras tend to be shorter (mostly 2.6-3.7 cm versus 3.4-4.6 cm), broader/blunter (often spatulate-oblongate versus linear-lanceolate) and more prominently veined. These trees may include the types of *F. campestris* Britt. and var. *austinii* Fern. (F, GI); they probably deserve a distinct varietal name, to be determined. Seedlings are sometimes found that appear partly derived from these planted trees. "Marshall's Seedless" has sometimes been confused with species of sect. Fraxinus, which generally have sessile leaflets.

HAB 9,6? E 2. **ABU** g10 s9 -3.

1467--Fraxinus pennsylvanica Marsh. var. pennsylvanica

Oleaceae: Fraxinus <Melicoides> pennsylvanica var. p.

These relatively hairy plants extend less into the Great Plains than var. subintegerrima, and less onto the southeastern Coastal Plain (F, RAB, St). Within Ky. they tend to occur on sites with more seasonal drying, including streamheads on limestone and drier terraces on sandy alluvium. Mapping here is somewhat provisional, pending more detailed assessment; pubescence may vary continuously (from glabrous to tomentose) and tends to be overlooked in field and herbarium. Lower leaf surfaces are often pale due to hairs, causing misidentification as *americana*.

HAB 6,9,4 D? 2. **ABU** g9? s8? -3.

1468--Fraxinus profunda (Bush) Bush

Oleaceae: Fraxinus <Melicoides> profunda (tomentosa; pennsylvanica var. profunda)

This hexaploid ($2n = 138$) is widely distributed over eastern states, but concentrated in more permanent wetlands and with a fragmented range similar to that of *Populus heterophylla* (Little 1971; PL). In addition to being locally frequent in swamps of the lower Ohio Valley, there are scattered populations on base-rich soils further upstream.

F. profunda has often been confused with *pennsylvanica* or *americana* (sensu lato), but hybridization has not been demonstrated (Nesom 2010b). It

has larger fruits (mostly 40-70 x 6-11 mm versus 20-45 x 4-8 mm), and larger leaflets (mostly 9-15 x 3.5-7 cm versus 7.5-11 x 2.5-5 cm), usually with more rounded bases and longer petiolules. Young twigs, rachises and leaflets are tomentose (versus glabrous to tomentose).

HAB 9,3 E? 2. **ABU** g8 s7 -4.

1469--Fraxinus americana L.

Oleaceae: *Fraxinus* <*Melicoides*> *americana* (var. a.)

In its broad sense this widespread eastern species is highly variable, including polyploids (Wallander 2008, Nesom 2010c, W). Nesom has revived division into three species: *americana* (2n = 46), *smallii* (92) and *biltmoreana* (138). All three taxa differ from other eastern ashes in their minutely reticulated, waxy-whitened lower leaf surfaces.

F. americana, sensu stricto, has a relatively northern range, being rare to absent on the southeastern Coastal Plain. It differs from the other two taxa in its generally smaller fruits (mostly 25-32 mm long versus 33-54 mm), deeply notched petiole bases usually wrapped around buds (versus shallow-notched to truncate, the sides no more than level with tops of buds), usually glabrous leaves except along major veins (at least in Ky.), and glabrous twigs (versus glabrous or hairy). Its leaves tend to be smaller, on average, with upper surfaces usually plain yellowish-green (versus bluish) and less glossy. In Ky. confirmed records of *americana*, sensu stricto (mapped as solid symbols), are concentrated in the Bluegrass region and surrounding Knobs; some of the uncertain records mapped here (open dots) may be *smallii* instead. Typical *americana* appears to be much less frequent to virtually unknown in western regions of Ky. and Tenn., except along larger valleys of the Cumberland Rv. and Tennessee Rv. (Nesom 2010c).

Hybrids between the *americana* group and the *pennsylvanica* group are often suspected, but there is no conclusive evidence from the wild. Nesom found virtually no indication of hybrids, based on examination of many herbarium colls. JC has found a few specimens (< 1%) that cannot be confidently assigned, and suspects that sun-leaves may have more waxy lower leaf surfaces.

HAB 7,5,11 D? 2. **ABU** g10 s8 -3.

1470--Fraxinus smallii Beadle

Oleaceae: *Fraxinus* <*Melicoides*> *smallii* (*americana* var. *subcoriacea*)

Mapping here is provisional; see also notes under *americana* and *biltmoreana*. *F. smallii* is reported to range widely across eastern states south of the Great Lakes and New England (Nesom 2010c). Compared to *biltmoreana*, it has largely glabrous twigs, petioles and rachises (versus sparsely to densely hairy); fruits are smaller, on average (up to 44 mm long versus 54 mm). In Ky. leaflets are usually pubescent below, relatively large and bluish (like *biltmoreana* but unlike *americana*), but there is much variation in these characters. Although Nesom (2010c) indicated that *smallii* is tetraploid, recent testing with flow cytometry by R. Olsen (National Arboretum, pers. comm.) has shown that all submitted specimens of *smallii* so far are hexaploids, as in *biltmoreana*; these include four by JC from south-central Ky. It may be more reasonable to treat these trees as a relatively smooth variety of *biltmoreana*.

Initial mapping here is based partly on Nesom's data (triangles), pending further study of variation in the *americana* group. Uncertain records (open dots) are based on colls. without fruits but that generally match *smallii* based on leaves and twigs. *F. smallii* appears to be widespread in Ky. and at least twice as frequent as typical *americana*. However, fruiting or flowering specimens form a much smaller percentage of colls. (EKY, KY): ca. 10-20% versus 60% of *americana*.

HAB 10,11,7? D? 2. **ABU** g9 s9 -2.

1471--Fraxinus biltmoreana Beadle

Oleaceae: *Fraxinus* <*Melicoides*> *biltmoreana* (*americana* var. b.)

Mapping here is provisional; see notes under *americana* and *smallii*. *F. biltmoreana* occurs widely in eastern states south of the Great Lakes and New England, and may be most frequent on rocky soils in the Ohio Rv. watershed and in the Ridge-and-Valley region (Nesom 2010c). Fresh twigs, petioles and rachises are densely to sparsely hairy; lower leaflet surfaces are usually covered with dense hairs, but in a few colls. hairs are confined to midribs and primary veins. *F. biltmoreana* tends to occur more frequently on relatively dry sites. In Ky. it appears to be about as frequent as *smallii*, based on provisional examination of colls. at KY and EKY. However, flowering or fruiting specimens form only ca. 1-5% of the colls. in those herbaria; compare data noted under *smallii*.

HAB 10,11,7? D? 2. **ABU** g9 s9 -2.

1472--Polypremum procumbens L.

Tetrachondraceae [*Loganiaceae**]: *Polypremum procumbens*

HAB H-10,9? ::? C? 5. **ABU** g10 s4? -4?

1473--*Campsis radicans* (L.) Seem. ex Bureau

Bignoniaceae: *Campsis radicans*

This weedy vine is widespread across southeastern states, especially on damp fertile soils. It probably occurs in all counties of Ky., but it is much less common in forested hilly regions. In addition to being typical of old fencerows and roadsides in farmland, *Campsis* is locally common in native vegetation along wetland margins and riverbanks.

HAB f-8,6,4,1 D? 4. **ABU** g10 s10 +2?

1474--*Bignonia capreolata* L.

Bignoniaceae: *Bignonia (Anisostichus) capreolata*

This monotypic genus of southeastern states has a northern limit just north of the Ohio Rv., where it occurs on warmer slopes in s. Ohio and sw. W.Va. It has not yet been recorded in most adjacent Ky. counties, where north and east aspects prevail along the major river valleys, but it is abundant along ravines further south in the Bluegrass region. *Bignonia* is the almost only evergreen woody vine that is native to Ky. (most *Smilax* spp. sometimes have partially persistent leaves). It may be the basis for "Jessamine" County, where local history indicates that the county was named after a common flower along Jessamine Creek.

HAB 7,4,5,6 D 2. **ABU** g10 s10 -2.

1475--*Catalpa speciosa* (Warder) Warder ex Engelm.

Bignoniaceae: *Catalpa speciosa*

The original main range of this widely planted tree was probably in the central to lower Mississippi Valley (Little 1971; W). Colls. from the Mississippi and Ohio Rv. bottomland in CARL, FULT, HICK, MCLE, UNIO and perhaps elsewhere appear to be from native plants. Rafinesque (1836, 1:31-32) suggested that this species was spread to the north by Indian tribes. There is archaeological evidence that *speciosa* occurred upstream along the Ohio in W.Va. before 1500 AD (Hemmings & Core 1976), and this species is currently frequent in the lower Kanawha Rv. valley. Much *speciosa* is still planted throughout the whole Ohio Valley, and there are frequent escapes. Consistent distinction of native from adventive plants is not attempted here. Also, distinction from *bignonioides* needs to be rechecked in several cases; see notes under that species.

ALI s. **HAB** f-4,6,7? D? 4. **ABU** g8 s8 +1.

1476--*Catalpa bignonioides* Walt.

Bignoniaceae: *Catalpa bignonioides*

The main range of this widely planted southeastern tree was probably on the Coastal Plain from Ga. to Miss., probably on more acid, infertile and siliceous soils than *speciosa* (Little 1971; W; R. Olsen, pers. comm.). Status in Ky. and Tenn. remains somewhat uncertain. All Ky. records may come from escaped plants, but native status has been suggested in MCLE, MCRE, TRIG, WHIT and perhaps elsewhere (Clark & Bauer 2001; CW, M).

C. bignonioides is often confused with *speciosa*, especially without its distinctive smaller flowers and fruits (Gm, F, Cr, J, Y; R. Olsen, pers. comm.). Leaves of *bignonioides* tend to be more malodorous, more persistently pubescent (with stellate hairs as well as straight ones), and less long-tapered. Its bark is initially light brown (versus reddish-brown); older trunks have distinctive short thin scaly plates (versus elongated ridges and furrows); trees tend to be short, with more spreading branches. There is genetic evidence that some cultivated plants are derived from hybridization (R. Olsen, pers. comm.).

ALI s. **HAB** 4,6? C? 4. **ABU** g8 s5? -1?

1477--*Proboscidea louisianica* (P. Mill.) Thellung

Martyniaceae [Pedaliaceae*]: *Proboscidea [Martinia] louisianica*

This widespread southern weed is sometimes cultivated for its fruits. It may be native in Ky. on some western lowlands and along the Ohio Rv., but adventive elsewhere (FAYE, JESS, WASH). Further evaluation of the records and localities is needed. *P. parviflora* (Woot.) Woot. & Standl. is a more southwestern species that was cultivated for fiber by native people (Ford 1985).

ALI s. **HAB** GH-10,9? ::? E? 6? **ABU** g9? s6? -3?

1478--*Paulownia tomentosa* (Thunb.) Sieb. & Zucc. ex Steud.

Paulowniaceae [Scrophulariaceae]: *Paulownia tomentosa*

This Chinese tree is famous for its attractive blue flowers, unusually large leaves, and valuable light strong wood. Assignment to family remains uncertain (APG, W). *Paulownia* has been widely planted in southeastern states, and has become much naturalized, especially in a zone from Va. to Ark. (K, SE). In Ky. it is locally frequent along roadsides, and sometimes colonizes gaps within mature native forest. Some mapped colls. may come from planted trees, but the species is clearly self-seeded at many sites. Sight records of SE are added as open dots.

ALI AS. **HAB** r-8,7 C 4. **ABU** +5*.

1479--*Buddleja davidii* Franch. W

Scrophulariaceae (sensu stricto): *Buddleja davidii*

Although widely cultivated (as "butterfly bush"), there are few reports of this Chinese shrub escaping in eastern North America (PL, W). In southeastern states, it may be increasing in Appalachian regions. JC recently collected a seedling at the edge of woods on a sandy ridge in PULA. It also been reported from PIKE (SE).

ALI AS.

1480--*Scrophularia marilandica* L.

Scrophulariaceae (sensu stricto): *Scrophularia marilandica*

This tall herb is widespread across eastern North America, except in Atlantic and Gulf Coastal states. It is most frequent in thin woods and edges on moist fertile soils. The closely related northern species, *S. lanceolata* Pursh, has been reported from CARR (Miller 1986; BA) and occurs near Ky. in Va., but no coll. has been located. In *lanceolata*, the sterile filament is yellowish-green (versus dark purple or brownish) and relatively broad; flowering is earlier, and capsules tend to be larger; leaves are more coarsely serrate, and $2n = 92-96$ versus ca. 86 (Pennell 1935; Cr, W).

HAB 7,8,10,4 D 3. **ABU** g9 s9 -3.

1481--*Verbascum blattaria* L.

Scrophulariaceae (sensu stricto): *Verbascum blattaria*

This Eurasian biennial is a widespread weed across temperate North America, and it became common in Ky. early after settlement. Short (1828-29) noted: "It is found in similar situations with the common mullein, and is frequently seen growing between the bricks of pavements and moist walls." White and rarely red color forms are collected from JEFF (DHL) and elsewhere. Reports from Ky. of the closely related *V. phoenicium* L., which has purple flowers, appear to have been based on misidentified *blattaria* (as reviewed by M)

ALI EU. **HAB** F-10 :: D 5. **ABU** +6.

1482--*Verbascum thapsus* L.

Scrophulariaceae (sensu stricto): *Verbascum thapsus*

This tall biennial from Europe is a widespread weed across temperate North America, especially on disturbed ground. In Ky. it has been common since early after settlement. In the central Bluegrass, Short (1828-9) noted: "Everyone is familiar with this very common plant, which though originally introduced is now but too thoroughly naturalized among us... Abundant in old

fields, stony grounds, and washed hill-sides.." Rafinesque (1936, 1:31) even expressed uncertainty about its naturalized versus native status in North America.

ALI EU. **HAB** R-10,12 :: D 6. **ABU** +6.

1483--*Verbascum phlomoides* L.

Scrophulariaceae (sensu stricto): *Verbascum phlomoides*

Although widely scattered in northern and eastern regions of North America, this alien is rare in southeastern states. In Ky. virtually the only records (M) are from Gm during 1888-1914: "common all along the [Nolin] river" in the counties mapped here, where it had "probably been introduced along the railroad and its seeds carried down stream." In 1914, he noted: "It has not spread to other parts of the State as was anticipated at the time, and is still restricted, as far as I have learned, to the region in which it was discovered."

ALI EU. **HAB** R-10 :: C? 6. **ABU** +4<.

1484--*Linaria vulgaris* P. Mill.

Veronicaceae <Antirrhineae> [Scrophulariaceae*]: *Linaria vulgaris*

This attractive perennial weed (common toadflax or "butter-and-eggs") is widespread in temperate North America. In Ky. it established early after settlement (Short et al. 1833). In 1914, Gm noted: "most frequently observed on waste ground and commons around towns." It is now widely scattered across farmed regions.

ALI EU. **HAB** F-10 ::? C 6. **ABU** +5.

1485--*Nuttallanthus texanus* (Scheele) D.A. Sutton

Veronicaceae <Antirrhineae> [Scrophulariaceae*]: *Nuttallanthus* [*Linaria*] *texanus* (*canadensis* var. t.)

This annual is widespread from southern states to temperate regions of South America, but it be largely adventive in eastern states (F, Cr, W). In Ky. it appears somewhat weedy and adventive, but it may be native on sandy soils of the Mississippian Embayment, as in w. Tenn. (Ch; D. Estes, pers. comm.). See also notes under *canadensis*.

ALI w. **HAB** F-10 ::? C? 6? **ABU** g10 s6 -1?

1486--*Nuttallanthus canadensis* (L.) D.A. Sutton W

Veronicaceae <Antirrhineae> [Scrophulariaceae*]: *Nuttallanthus* [*Linaria*] *canadensis* (var. c.)

This widespread northern annual has been confused with *texanus*, and all records deserve to be rechecked. It has been collected recently from a brushy

old field in MADI (Poindexter & Thompson 2008; at BERA), and there has been a report from PIKE (F. Levy, pers. comm.; check NCU); see also BA. N. canadensis is also verified in se. Tenn. (D. Estes, pers. comm.). It differs from texanus in its smaller flowers: 8-13 mm long (versus 14-22 mm), from tip of spur to tip of upper lip, with the spur 5-9 mm long (versus 2-6 mm). Also, seeds are longitudinally ridged (versus densely tuberculate).

1487--Chaenorhinum minus (L.) Lange

Veronicaceae <Antirrhineae> [Scrophulariaceae*]: Chaenorhinum [Linaria] minus

This weedy annual is widespread in northeastern states, especially along railroads. Variation may need further study; two subspecies are recognized in Europe (2n = 14 and 28).

ALI EU. **HAB** R-10 ::: D 6. **ABU** +5.

1488--Cymbalaria muralis P.G. Gaertn., B. Mey. & Scherb.

Veronicaceae <Antirrhineae> [Scrophulariaceae*]: Cymbalaria [Linaria] muralis

Although widely scattered over northern regions of North America, this ornamental weedy annual of wall-crevices and similar places has remained rare in southeastern states. The few Ky. records mostly date from 1900-1950.

ALI EU. **HAB** 12 || E 6. **ABU** +4<.

1489--Kickxia spuria (L.) Dumort. R

Veronicaceae <Antirrhineae> [Scrophulariaceae*]: Kickxia [Linaria] spuria

This Mediterranean annual is rarely established in eastern states. In Ky. there are reports from LAUR (M) and the Mississippian Embayment (J), but colls. have not yet been seen.

ALI EU.

1490--Kickxia elatine (L.) Dumort.

Veronicaceae <Antirrhineae> [Scrophulariaceae*]: Kickxia [Linaria] elatine

This Eurasian annual is a widely scattered weed in eastern states, especially in sandy soils. Variation needs further study (Cr, W); two subspecies are recognized in southeastern states (2n = 16 and 36).

ALI EU. **HAB** F-10 ::: C? 6. **ABU** +4.

1491--Misopates orontium (L.) Raf. R

Veronicaceae <Antirrhineae> [Scrophulariaceae*]: Misopates [Antirrhinum] orontium

This is an ornamental annual from southern Europe that has become naturalized at a few sites in North America, especially in the Pacific northwest (PL). It was reported from Ky. by Pennell (1935), but no coll. has been located. The more showy perennial "snapdragon" from Mediterranean regions, Antirrhinum majus L., is not known to have escaped in Ky. at all. Despite much cultivation and occasional escapes, neither species appears to be truly persistent in eastern states (F, Cr, W).

ALI EU.

1492--Collinsia verna Nutt.

Veronicaceae <Cheloneae> [Scrophulariaceae*]: Collinsia verna

This winter-annual is widely scattered in east-central states, centered on the central Mississippi Rv. and upper Ohio Rv. watersheds. However, it is largely restricted to damp woods on highly fertile soils, often with much patchiness and local genetic differentiation (Greenlee & Rai 1986). In Ky. it is most frequent within the Bluegrass region, but even there the distribution is fragmented to a degree not explained by current habitat. In the central Bluegrass, Short (1828-9) noted: "This beautiful little plant, which is seen in profuse abundance on many parts of the Dry-ridge road to Cincinnati, is occasionally, though rarely, found in this immediate vicinity."

C. verna may be most abundant where thin woods are recovering from past grazing, sometimes expanding within a few decades to cover 10s of acres (e.g. at Raven Run in FAYE; Campbell et al. 1995). It is generally absent in deeper woods with less obvious history of disturbance. Also, although this species is capable of some self-pollination (Kalisz et al. 2004), initial horticultural experience in Ky. suggests that small starter populations of ca. 10-100 plants may not be able to attract sufficient pollinators for persistence.

HAB 7,5,4 :: E 2. **ABU** g8 s7 -4.

1493--Collinsia heterophylla Buist ex Graham C

Veronicaceae <Cheloneae> [Scrophulariaceae*]: Collinsia heterophylla

F stated that this Californian species is often cultivated, "tending to spread to cool situations in Ill. and Ky." Presumably F had seen a coll., but no further data are available.

ALI W.

1494--Penstemon canescens (Britt.) Britt.

Veronicaceae <Cheloneae> [Scrophulariaceae*]: Penstemon canescens

Mapping here is provisional. Distinction from *brevisepalus*, which appears much more common in Ky., and from *pallidus* (a western relative) has often been difficult. *P. canescens* may just be a large-flowered, broad-leaved variant in this group, with more restriction to relatively cool mesic sites in the Appalachians (centered on the Blue Ridge). The related southern Appalachian species, *P. smallii* Heller, was reported from Ky. by BA, but no coll. has been located; its record from nearby in Tenn. (Ch) was based on a misidentified *calycosus* (D. Estes, pers. comm.).

Compared to *brevisepalus* (F), corollas of *canescens* are 2-3.5 cm long (versus 1.5-2.6 cm), the tube 8-10 mm and abruptly enlarged into the throat (versus 5-8 mm, gradually tapering); and its sepals after anthesis equal or exceed the capsule, with lanceolate shape (versus equal and ovate).

HAB f-10,7 B? 4. **ABU** g9 s8 -2.

1495--*Penstemon brevisepalus* Pennell

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Penstemon brevisepalus* {*canescens** var. b. suggested comb.}

This has been combined with *canescens* in some treatments (e.g. J, W) or with *pallidus* in others (e.g. K), and it appears intermediate in some characters; see notes under those species. However, it does appear to have some geographic segregation, being centered on the Appalachian Plateaus in W.Va., Ky. and Tenn. (Pennell 1935; D. Estes, pers. comm.). Variety status may be reasonable.

HAB f-10,7 C? 4. **ABU** g8 s8 -3.

1496--*Penstemon pallidus* Small

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Penstemon pallidus* (*arkansanus* var. *pubescens*)

This is largely midwestern but Pennell (1935) also mapped disjunct plants in Appalachian regions east of Ky., where they may be adventive. In Ky. there has been some confusion with *brevisepalus* (in eastern regions) and with *tenuiflorus* (in western regions); see F, Cr and W for alternative keys.

P. pallidus (along with the Ozarkian *P. arkansanus* Pennell) differs from *brevisepalus* and *canescens* in its leaves, which are firm to subcoriaceous (versus "herbaceous and membranaceous"), the cauline ones lanceolate to oblong/linear and ca. 0.5-2 cm wide (versus ovate to oblong/lanceolate and ca. 1.5-4.5 cm wide), usually entire or remotely denticulate (versus sharply dentate to entire). Hairs on stems and leaves are usually rather dense

("velvety") and short (ca. 0.1-0.5 mm versus often up to 0.5-1 mm). Flowers are whitish outside (versus purple- or violet-tinged), with relatively short sepals (2-5 mm versus 5-10 mm) and corollas (1.5-2.2 cm versus 1.5-3.5 cm).

HAB f-10,7,12? D? 4. **ABU** g9 s8 -3.

1497--*Penstemon australis* Small R

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Penstemon australis*
This has distinctive reddish-purple flowers on strongly ascending peduncles, and mostly occurs on sandy soils of the southeastern Coastal Plain from Ala. to Va. For Ky., colls. have been reported in herbarium databases from EDMO (NY) and ROCK (NCU), but these remain dubious. *P. australis* has also been reported from w. and c. Tenn., including Stewart Co. adjacent to Ky. (APSU; Ch), but all records from Tenn. are incorrect according to D. Estes (pers. comm.).

1498--*Penstemon alluviorum* Pennell

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Penstemon alluviorum* (*digitalis** var. a.)

This occurs mostly on lowlands in the central Mississippi and lower Ohio Valleys. It is close to *digitalis* but with several differences (Pennell 1935, W): flowers/fruits smaller; inflorescence less glandular; leaves usually narrower and more pubescent; stems less lustrous and often more pubescent, at least in narrow lines.

HAB f-9,10 C 5. **ABU** g8 s7 -4.

1499--*Penstemon deamii* Pennell R

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Penstemon deamii* {*digitalis** var. *deamii* suggested comb.}

This was described from the flatwoods of s. Ind. and s. Ill. It is close to *alluviorum*, differing in its sepals only 2-4 mm long (versus 5-9 mm) and scarious margined (versus not or scarcely); also, its lower leaves are rounded at the apex and entire or slightly denticulate (versus acuminate and rather sharply serrate). *P. deamii* was reported from HARD by Cranfill (1989), but the coll. may be lost or still unprocessed.

1500--*Penstemon digitalis* Nutt. ex Sims

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Penstemon digitalis* (var. d.)
This eastern species of damp fertile soils is considered to have originated in midwestern region, and may be somewhat adventive to the south and east (Pennell 1935; F). It is often difficult to distinguish from *alluviorum* and

calycosus. This group is usually distinct from the canescens-pallidus group in their less bearded sterile filaments, inflated corolla-throats (with little internal ridging and lower lobes more or less equalling upper lobes), glabrous lower leaf surfaces, and lack of longer hairs (ca. 0.5-1 mm) on stems or leaves (Pennell 1935; F, Cr, W).

Mapped records are tentative in some cases. *P. digitalis* has been combined with *alluviorum* by some authors, and some colls. need checking; see notes under the latter. Both taxa have largely white flowers with hairy anthers. Some atypical colls. mapped here from LAWR, LEWI (KNK) and elsewhere have short-pubescent stems, suggesting transitions to *calycosus* or *laevigatus*, which are distinguished by their glabrous anthers and often distinctly purplish flowers.

HAB f-1,4,6,10 D 4. **ABU** g10 s8 -3.

1501--*Penstemon calycosus* Small

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Penstemon calycosus* (*laevigatus** var. c.)

This occurs in east-central states from the Mississippi Rv. to the Appalachians, and perhaps adventively in northeastern states (PL, K). It is typical of dry base-rich soils. Although generally a distinct species, some colls. from Ky. may be transitional to *digitalis* or *alluviorum*. Also, the colls. from CALL and MCRA (MUR) have relatively narrow leaves, suggesting transitions to the more closely related species, *laevigatus*; see notes under that name. Most *calycosus* in the central Ohio Valley, at the center of its range, has stems with distinctively dense short hairs (ca. 0.1-0.5 mm), but in c. Tenn. (D. Estes, pers. comm.) and some peripheral regions stems are often glabrous (Pennell 1935).

HAB f-10,7,12 E 4. **ABU** g9 s8 -3.

1502--*Penstemon laevigatus* Ait.

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Penstemon laevigatus* (var. l.)

This is widespread in most southeastern states east of the Mississippi and Ohio rivers, especially on damp to seasonally dry, medium acid soils. It has often been confused with *calycosus*, and some authors have combined these species (Cr, J). Without flowers it is also confusable with *alluviorum*. Some reports of typical *laevigatus* from Ky. are dubious (M), but the colls. mapped here are generally confirmed. Records from LYON, TODD, TRIG (APSU) are part of a reported disjunct northwestern section of its range in sandy or

cherty hills northwest of the Nashville Basin (Ch). However, D. Estes (pers. comm.) has found that all these western plants in Ky. and Tenn. are closer to *alluviorum*.

In addition to the distinctive glabrous anthers and pale purplish flowers of *laevigatus* (characters shared with *calycosus*), this species has relatively small flowers and capsules. Also, its leaves are glabrous, somewhat bluish, relatively narrow (ca. 1-3 cm), and entire to obscurely denticulate (versus often clearly denticulate to serrate in most other species).

Similar plants in alluvial woods to the south, mostly west of the Mississippi, are more robust with deeper flower color, and have been named *P. tenuis* Small (Pennell 1935). That is a rather poorly understood taxon (or complex) that has been recently discovered in Tenn. and may be expected in Ky. (D. Estes, pers. comm.).

HAB f-9,10,6,7 C 4. **ABU** g8 s7 -2.

1503--*Penstemon tenuiflorus* Pennell

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Penstemon tenuiflorus*
This is restricted to calcareous glades and prairie remnants in the southern Interior Low Plateaus and Black Belt. Distinction from *hirsutus* can be difficult (Pennell 1935, Clements et al. 1998). Both *tenuiflorus* and *hirsutus* differ from other species in their relatively closed corolla throats, without darker lines (often present in others). Also, their stems usually have dense, long-curling, mostly glandular hairs (versus mostly glabrous to canescent, with non-glandular hairs except in inflorescences).

P. tenuiflorus differs from *hirsutus* in its pubescent leaves (versus largely glabrous), remotely serrate to entire (versus usually with numerous teeth), relatively firm and gray-green (versus thin and bright green). Its flower buds are yellow (versus yellow-purple), the corolla creamy white at anthesis (versus violet-purple with white lobes); sepals are 2-5 mm long (versus 3-8 mm).

HAB 12,10? = E 5. **ABU** g7 s7 -3.

1504--*Penstemon hirsutus* (L.) Willd.

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Penstemon hirsutus*
This occurs mostly in midwestern to northeastern regions, generally on limestone clifftops. In Ky. it is known mostly from the Bluegrass and Knobs

regions, but it is probably much more frequent in western regions than records indicate; D mapped much in s. Ind. See also notes under *tenuiflorus*.

HAB 12,10 +\ E 4. **ABU** g8 s8 -1.

1505--*Penstemon tubiflorus* Nutt. R

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Penstemon tubiflorus*
This occurs mostly in or near the Ozark region, but appears to be adventive in some eastern states (Pennell 1935). Although distinctive, it can be confused with *alluviorum* (especially) or *digitalis*; further study of colls. filed under these names is needed. *P. tubiflorus* differs (F) in its corollas minutely glandular-puberulent within (versus glandless), leaves entire or nearly so (versus entire to sharply serrate), and stems glabrous (versus glabrous or hairy, at least in lines). It has been reported from Ky. (M), but no colls. have been located; the report of Mohlenbrock et al. (1966) from GRAV (SIU) was based on misidentified *digitalis*.

HAB f-10,7,8,12? D? 4? **ABU** g8 s2? -5?

1506--*Chelone glabra* L. var. *glabra*

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Chelone glabra* var. *glabra*
This diploid ($2n = 28$) is widespread in wet woodlands across eastern North America, except on the Gulf Coastal Plain. Variation deserves further assessment. Some Appalachian records mapped here may be transitional to var. *elatior*. [With the out-moded treatment of F, a coll. from CALL (WKY) was referable to var. *linifolia* Coleman; and several scattered colls. have been referred to forma *tomentosa* (Raf.) Pennell.]

HAB 6,4 C 3. **ABU** g9 s8 -3.

1507--*Chelone glabra* L. var. *elatior* Raf.

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Chelone glabra* var. *elatior* (C. montana)

This largely Appalachian variety has reddish flowers and relatively large leaves (F). However, distinction from typical *glabra* is often unclear, and some authors have combined these taxa (W; see also, Nelson et al. 1998).

HAB 6,4? B? 3. **ABU** g8 s7 -2.

1508--*Chelone obliqua* L. var. *erwiniae* Pennell & Wherry

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Chelone obliqua* var. *erwiniae*

Variation within this species deserves further study. There is a southern Appalachian race with $2n = 56$, which may represent var. *erwiniae* (Nelson et

al. 1998); in the rest of the species, $2n = 84$. All Appalachian colls. of *obliqua* in Ky. have been referable to var. *erwiniae*, following Pennell (1935), but that taxon has not been distinguished in some recent treatments.

HAB 6 B? 3. **ABU** g6? s2? -1.

1509--*Chelone obliqua* L. var. *obliqua* R

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Chelone obliqua* var. o.
Typical *obliqua* is a southeastern plant typical of swampy woods on the Coastal Plain. It appears to be rare in Ky. (M), and the only verified record may be a coll. from the edge of Murphy's Pond in HICK (M. Medley #19246-89 for WKY). Further review of colls. is needed; see notes under other varieties.

HAB 6 C? 3. **ABU** g6? s2? -3.

1510--*Chelone obliqua* L. var. *speciosa* Pennell & Wherry

Veronicaceae <Cheloneae> [Scrophulariaceae*]: *Chelone obliqua* var. *speciosa*

This midwestern variety appears to be generally distinct (Pennell 1935; F). In Ky. it is locally frequent in western swamps and seeps on medium acid soils. However, some colls. from GRAV (WKY) and HICK (MUR) may be at least transitional to var. *obliqua*.

HAB 6 C? 3. **ABU** g7 s6 -3.

1511--*Gratiola viscidula* Pennell

Veronicaceae <Gratioloae> [Scrophulariaceae*]: *Gratiola viscidula*

This diploid ($2n = 14$) is a generally uncommon to rare in marshy shorelines around old sloughs and ponds, mostly on the Atlantic Coastal Plain and Piedmont, but also scattered west to Mo. All colls. from Ky. are referable to var. *shortii* (Dur. ex Pennell) Gleason, with relatively large flowers and leaves; this taxon may be a meaningful western variant.

Also expected is the southern relative, *G. brevifolia* Raf., which occurs in Tenn. close to Ky. in Montgomery Co. (1 mile ESE of Guthrie) and in Morgan Co. (on banks of Obed Rv.; D. Estes, pers. comm.). Early colls. of C.W. Short from Ky. (Kew, PH) were named *brevifolia* by G. Bentham (in DeCandolle's 1846 *Prodromus*) or *shortii* by E. Durand, but *viscidula* was not described until 1919, and ssp. *shortii* not until Pennell (1935). Short's colls. were probably from the wetlands of BATH or ROWA (Campbell et al. 1992). Another related species, the tetraploid, *G. aurea* Michx. (= *G. lutea* Raf.), has been reported from Ky. but probably in error (see M for details).

HAB 2 ::? C 5. **ABU** g7 s4 -3.

1512--Gratiola virginiana L.

Veronicaceae <Gratioleae> [Scrophulariaceae*]: *Gratiola virginiana*
This southeastern annual is often confused with *neglecta*; 2n = 16 in both species, but hybrids are unknown. *G. virginiana* tends to occur on more acid soils, often sandy or boggy.

HAB 6,9,1 ::: B 4. **ABU** g9 s8 -2.

1513--Gratiola neglecta Torr.

Veronicaceae <Gratioleae> [Scrophulariaceae*]: *Gratiola neglecta*
This annual is widespread in temperate North America, usually growing on bare wet ground.

HAB g-9,2 ::: D 6. **ABU** g10 s10 -1?

1514--Gratiola quartermaniae D. Estes

Veronicaceae <Gratioleae> [Scrophulariaceae*]: *Gratiola quartermaniae*
This recently described species is largely restricted to flat puddling areas of limestone glades or adjacent pastures in n. Ala. and c. Tenn., but with disjunctions as far as c. Tex., n. Ill. and s. Ontario (Estes 2007). It has been confused with *neglecta*. The only Ky. record is a coll. from SIMP (WKY): M.E. Medley-78-012, 9 May 1978, "wet spot in pasture, E side of road across from the Simpson County Glade, 1/8 mi S from the Warren Co. line on US 31W."

HAB g-9,2 ::: D 6. **ABU** g10 s10 -1?

1515--Sophronanthe pilosa (Michx.) Small

Veronicaceae <Gratioleae> [Scrophulariaceae*]: *Sophronanthe [Gratiola*] pilosa*

This southeastern species occurs mostly in damp places within pine savannas on the Coastal Plain. It does not belong in *Gratiola*, and might even be justified in the monotypic genus *Tragiola* (W; D. Estes, pers. comm.).

HAB 9 ::? A 6? **ABU** g9 s3 -5.

1516--Bacopa caroliniana (Walt.) B.L. Robins. R

Veronicaceae <Gratioleae> [Scrophulariaceae*]: *Bacopa caroliniana*
According to RAB and Cr, this southeastern subaquatic of shorelines occurs in Ky., disjunct from its main range on the Coastal Plain. However, no coll. has been located.

1517--Bacopa rotundifolia (Michx.) Wettst.

Veronicaceae <Gratioleae> [Scrophulariaceae*]: *Bacopa <Hydrantheum> rotundifolia*

This is a widespread subaquatic species of shorelines in central states, with disjunct or adventive records in eastern states.

HAB 2 ~ D? 6. **ABU** g9 s8 -3.

1518--Mecardonia acuminata (Walt.) Small

Veronicaceae <Gratioleae> [Scrophulariaceae*]: *Mecardonia [Bacopa] acuminata*

This is widely scattered across southeastern states, but usually restricted to marshy places on medium acid soils.

HAB 9,6 ::? C 4. **ABU** g8 s6 -4.

1519--Leucospora multifida (Michx.) Nutt.

Veronicaceae <Stemodieae> [Scrophulariaceae*]: *Leucospora (Conobea) multifida*

This weedy annual is widespread across eastern states, but centered in the Mississippi Rv. watershed. It is abundant along exposed shores of rivers, and has also become a common weed in regularly cropped fields. The genus is monotypic.

HAB H-10,1,12 ::+ D 6. **ABU** g9 s9 +1?

1520--Veronica polita Fries

Veronicaceae <Veroniceae> [Scrophulariaceae*]: *Veronica <Pocilla> polita ("didyma")*

In North America, this widely scattered diploid (2n = 14) annual appears to have been virtually unknown before Pennell (1935) and F, appearing first on ballast at ports. It is easily confused with *agrestis*, and colls. from Ky. deserve to be rechecked (Abbott et al. 2004). All Ky. records are from after 1970.

ALI EU. **HAB** H-10,7? ::: E 6? **ABU** +5.

1521--Veronica agrestis L.

Veronicaceae <Veroniceae> [Scrophulariaceae*]: *Veronica <Pocilla> agrestis*
This tetraploid (2n = 28) annual is probably widely scattered over eastern states, but it is similar to the closely related *polita* and there has been much confusion (Ch, W). Colls. from Ky. should be checked further. All verified Ky. colls. are dated from after 1970. In the late 19th Century, it was still mostly (or perhaps only) "near the coast" (Gray 1864, 1889).

ALI EU. **HAB** H-10 ::: D 6. **ABU** +5.

1522--Veronica persica Poir.

Veronicaceae <Veroniceae> [Scrophulariaceae*]: Veronica <Pocilla> persica ("tournefortii", "buxbaumii")

Under various synonyms, this tetraploid (2n = 28) annual was first reported in North America by Rafinesque in 1832 (Pennell 1935), then by Gray (1889) as "rare in Atlantic states". It is now widely scattered across temperate regions. The earliest Ky. record was provided by McFarland (1942); B did not include it.

ALI EU. **HAB** H-10,7? ::: D 6? **ABU** +5.

1523--Veronica hederifolia L.

Veronicaceae <Veroniceae> [Scrophulariaceae*]: Veronica <Pocilla> hederifolia

This octoploid (2n = 56) annual has been in North America since the late 19th Century, when perhaps restricted to Atlantic states (Gray 1889), and it is now widespread in east-central states. All Ky. records date from after 1970. It has become much more common than colls. suggest, especially in the Bluegrass region. It is the most invasive Veronica in woods, locally dominating moist moist fertile ground in younger woods and on floodplains.

ALI EU. **HAB** h-10,7,4 ::: E 4. **ABU** +6.

1524--Veronica arvensis L.

Veronicaceae <Veroniceae> [Scrophulariaceae*]: Veronica <Pocilla> arvensis

This diploid (2n = 14, 16) annual became a common weed across eastern North America after the late 19th Century, when it was "rather rare" and confined to coastal states (Gray 1864, 1889). In Ky. the first report of "arvensis" was in 1914, when Gm noted it was common in pastures and meadows, and had probably been introduced among forage seeds. However, it may also have been the plant called "agrestis" by Short (1828-9; Short et al. 1833): "Cultivated fields and pastures common."

ALI EU. **HAB** H-10 ::: D 6. **ABU** +6.

1525--Veronica peregrina L. var. peregrina

Veronicaceae <Veroniceae> [Scrophulariaceae*]: Veronica <Pocilla> peregrina var. p.

This polyploid (2n = 52) annual is a widespread native weed in temperate regions of North and South America, with var. peregrina predominant in most

of the range. Early after settlement in Ky., it was "abundant in gardens and cultivated fields" (Short 1828-29).

HAB H-9,10 ::: D 6. **ABU** g10 s10 +3.

1526--Veronica peregrina L. var. xalapensis (Kunth) Pennell

Veronicaceae <Veroniceae> [Scrophulariaceae*]: Veronica <Pocilla> peregrina var. xalapensis

This may have originated in southwestern regions (Pennell 1935, F, Cr). In Ky. it does not seem to be an ecologically distinct variety; mixed populations often occur.

HAB H-9,2? ::: D 6. **ABU** g10 s6? +1?

1527--Veronica serpyllifolia L.

Veronicaceae <Veroniceae> [Scrophulariaceae*]: Veronica <Veronicastrum> serpyllifolia (var. s.)

This creeping diploid (2n = 14) perennial is nearly cosmopolitan. Typical serpyllifolia is considered alien in North America (Cr). In Ky. it became established early after settlement. In the central Bluegrass, Short (1828-9) noted: "common in grass lots."

ALI EU. **HAB** S-9,6 ::: D 6. **ABU** +5.

1528--Veronica officinalis L.

Veronicaceae <Veroniceae> [Scrophulariaceae*]: Veronica <Veronica> officinalis

This creeping perennial is supposed by some authors (e.g. F) to have native and alien genotypes in North America; 2n = 18 and 32-36. However, there is no known morphological distinction between such plants. In Ky. officinalis is largely restricted to Appalachian regions, and it does not appear to be particularly weedy. It seems likely that these plants are native.

ALI m? **HAB** s-10,7,12,11? :: C 4? **ABU** g9 s8 -1?

1529--Veronica anagallis-aquatica L.

Veronicaceae <Veroniceae> [Scrophulariaceae*]: Veronica <Beccabunga> anagallis-aquatica (glandifera, ?connata)

If broadly defined to include V. glandifera Pennell, this circumboreal species of base-rich wetlands is widespread across cool temperate regions of North America. Although some authors consider it native in eastern states, plants of probable European origin may now be more widespread across North America (F, Cr). The earliest definite records of these taxa in Ky. were ca. 1910-1950 (M). Rafinesque (1836, 4:37) described connata from "West Kentucky near

waters"; his plant may have belonged with glandifera, but no type coll. is known.

Pennell (1935) considered anagallis-aquatica an alien and glandifera a distinct native species, with glandular hairs in inflorescences (versus glabrous or nearly so), more acuminate sepals, shorter styles, leaves widest near the base (versus about the middle) and more serrated. He mapped glandifera from central Atlantic states to the Ohio Valley. Some colls. from Ky. do fit his description of glandifera, but a thorough revision is still needed. Authors since Pennell have generally combined it with anagallis-aquatica (F, Cr) or with catenata (W). See also notes under catenata and americana; $2n = 36$ in all of these taxa.

ALI m? **HAB** 1,4,6? ::~ E 6. **ABU** g10 s5 -3?

1530--Veronica catenata Pennell

Veronicaceae <Veroniceae> [Scrophulariaceae*]: Veronica <Beccabunga> catenata (comosa; "connata")

This subaquatic, circumboreal species is widespread in cool temperate regions of North America. It is easily confused with the more weedy anagallis-aquatica (or glandifera), and combined by some authors (K). Sterile hybrids may be expected (Cr; Clapham et al. 1962). Based on Pennell (1935; see also F and Cr), catenata has obtuse to acute sepals (versus acute to acuminate); capsules relatively broad (reniform-obcordate versus ovate-orbicular) and more distinctly notched; and leaves more elongated (l/w ca. 3-5 versus 1.5-3). Other authors emphasize its smaller inflorescence with shorter pedicels (Clapham et al. 1962; J, W). Two colls. from Ky. are confirmed here: from FAYE (KY-Agr., PH; J.S. Terrill, 23 Jul 1892; Pennell 1935) and OLDH (DHL; M. Seargent #51). These colls. are referable to var. glandulosa (Farw.) Pennell, the predominant form in eastern regions (F).

HAB 1,2,4,6? ~ E 6. **ABU** g10 s2 -5.

1531--Veronica americana Schwein. ex Benth.

Veronicaceae <Veroniceae> [Scrophulariaceae*]: Veronica <Beccabunga> americana (beccabunga var. a.)

This is a widespread northern species of base-rich swamps and streambanks. The only records are from BOON (B), JEFF (BT), OLDH (B), and ROBE or NICH (PH etc., C.W. Short, "Blue-licks"; see also, Pennell 1935). None are dated after 1950.

HAB 1,2,4,6? ::~ E 6. **ABU** g10 s2 -5.

1532--Veronicastrum virginicum (L.) Farw.

Veronicaceae <Veroniceae> [Scrophulariaceae*]: Veronicastrum virginicum This tall perennial ($2n = 34$) is widely distributed across eastern and central states but centered in the midwest and uncommon to absent on the Coastal Plains. In Ky. Veronicastrum is generally found in regions with a history of native grassland or large animal trails before settlement, though it is probably most frequent in brushy transitions rather than full sun.

HAB 10,7,1 D 4. **ABU** g9 s7 -5.

1533--Dasistoma macrophylla (Nutt.) Raf.

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: Dasistoma [Seymeria] macrophylla

This is typical of rocky woods and thickets on base-rich soils in east-central states. It is often concentrated along relatively stable edges and bluffs in association with oaks.

HAB 11,12 E 3. **ABU** g9 s8 -2.

1534--Aureolaria virginica (L.) Pennell

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: Aureolaria [Gerardia] virginica

This eastern species is centered in Appalachian regions and absent west of Ky. and Tenn. Like others in the genus, it a semi-parasite on oak roots; it is much browsed by deer; and it may be more frequent than records indicate. At Mammoth Cave National Park, for example, the high deer population rarely allows a plant to complete its flowering and seeding (R. Seymour, pers. comm.). In early literature there was confusion in name with flava. In addition to its distinctive short dense pubescence, virginica usually flowers in Jun-Jul (versus Aug-Sep in others of the genus in Ky.); $2n = 26$ (versus 24 in flava).

HAB 10,7,11 C 3. **ABU** g10 s9 -2.

1535--Aureolaria patula (Chapman) Pennell

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: Aureolaria [Gerardia] patula

This occurs only on calcareous slopes along larger streams in s. Ky., c. Tenn., n. Ala. & n. Ga. It has been largely overlooked until recent decades, partly due to confusion with the more western species, A. grandiflora (Benth.) Pennell. Reports of grandiflora from Ky. appear to have been erroneous (M), but it is known from s. Ill. and ne. Ark. Without flowers or fruits, patula can be distinguished from other species in Ky. by the sparseness of its stem pubescence (versus dense in virginica or glabrous in the others).

HAB 1,4,5 + E 4. **ABU** g6 s5 -1.

1536--*Aureolaria laevigata* (Raf.) Raf.

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: *Aureolaria* [Gerardia] *laevigata*

This is largely restricted to central and southern Appalachian regions, but extends locally into some adjacent hills. In Ky. the outlying western records should be rechecked.

HAB 11,7 B 3. **ABU** g8 s8 -1.

1537--*Aureolaria flava* (L.) Farw. var. *flava*

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: *Aureolaria* [Gerardia] *flava* var. *f.*

This is widespread in eastern states, but its range is somewhat fragmented. It is largely restricted to dry woodland on somewhat base-rich soils, and it is probably sensitive to browsing by deer or other herbivores. F. Michaux (1805) reported *flava* from the "barrens" of western Ky.

HAB 11,7 D 3. **ABU** g9 s8 -3.

1538--*Aureolaria flava* (L.) Farw. var. *macrantha* Pennell

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: *Aureolaria* [Gerardia] *flava* var. *macrantha*

This western variety is not reliably distinguished from typical *flava* among some of the plants mapped here, and some authors have not recognized it at all (W). There may be little difference in range (D, St). Superficially, these larger flowered plants suggest a transition to the distinct midwestern species, *grandiflora* (see notes under *patula*).

HAB 11,7 D 3. **ABU** g9 s8 -3.

1539--*Aureolaria pectinata* (Nutt.) Pennell

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: *Aureolaria* [Gerardia] *pectinata* (*pedicularia* var. *pectinata**)

This annual is scattered across several regions of southeastern states, especially in open oak woods and brushy transitions on broad sandy ridges that have a history of fire. There has been occasional confusion with *pedicularia*, and some records should be rechecked; 2n = 28 in both species.

HAB 10,7 ::? B 4. **ABU** g8 s5 -4.

1540--*Aureolaria pedicularia* (L.) Raf. var. *austromontana* Pennell

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: *Aureolaria* [Gerardia] *pedicularia* var. *austromontana*

This southern Appalachian annual is typical of thin oak woods on dry sandy soils, especially with fires, roads or other disturbances. Some records from Ky. are old and dubious, but these plants are well-known to be scattered along Pine Mt. in BELL, HARL and LETC. Typical *pedicularia* is a more northern taxon that has been reported in error (M).

HAB 10,7 ::? B 4. **ABU** g6 s4 -3.

1541--*Agalinis purpurea* (L.) Pennell

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: *Agalinis* <Purpureae> [Gerardia] *purpurea*

Variation in this widespread eastern annual and its relatives needs further study. Although usually found in damp acid grasslands, it can occur in quite varied habitats, including calcareous soils outside Ky. (Pennell 1935; W). *A. purpurea* is close to the southeastern *fasciculata*, with some apparent intergradation; see notes under that name. A coll. from ROWA is referable to the more northern taxon, var. *parviflora* (Benth.) Boivin, which some recent authors (W) have recognized as a species: *A. paupercula* (Gray) Britt. However, its label data are dubious (Campbell et al. 1992).

HAB f-9 ::? B 5. **ABU** g10 s8 -3.

1542--*Agalinis fasciculata* (Ell.) Raf.

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: *Agalinis* <Purpureae> [Gerardia] *fasciculata* (*purpurea* var. *f.*)

This annual is widespread across warmer southeastern regions on seasonally dry to damp sites with varied substrates. It is sometimes hard to distinguish from *purpurea*, and has been treated as a variety in Tenn. (Robinson 1960). However, typical *fasciculata* may generally differ in several characters that deserve further attention (F). Although pubescence varies in both species, typical *fasciculata* has denser hairs on stems, and D. Estes (pers. comm.) has shown that in Tenn. and Ky. it has a distinctive line of hairs along each midrib of calyx teeth.

HAB f-9,10 ::? C 5. **ABU** g9 s7 -4.

1543--*Agalinis tenuifolia* (Vahl) Raf.

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: *Agalinis* <Tenuifoliae> [Gerardia] *tenuifolia*

Further study of variation is needed in this widespread eastern annual; see notes under var. *macrophylla*. Reports of the more western var. *parviflora*

(Nutt.) Pennell from Ky. are probably erroneous (M). Reports of the more southeastern relative, *A. setacea* (J.F. Gmel.) Raf., are probably based on misidentified *tenuifolia* (M).

HAB f-10,12,7,11 :: B 5. **ABU** g9 s9 -2?

1544--*Agalinis tenuifolia* (Vahl) Raf. var. *macrophylla* (Benth.) Blake T
Orobanchaceae <Gerardieae> [Scrophulariaceae*]: *Agalinis* <Tenuifoliae>
[Gerardia] *tenuifolia* var. *macrophylla* (*G. besseyana*)

This annual may be widespread in western regions of the state but further study is needed. Only Pennell (1929, 1935; B) appears to have previously applied this name to plants from Ky., distinguished by their longer calyx lobes (ca. 1-2 mm versus 0.2-1 mm) and larger capsules (ca. 5-7 mm long versus 3-4 mm). There are records from BREC (PH), EDMO (PH) and elsewhere (B). Robinson (1960) also segregated such plants in much of c. and w. Tenn. Pennell treated var. *macrophylla* as a largely midwestern taxon, often on lowlands. He mapped typical *tenuifolia* mostly in more eastern states, centered on the Appalachians and generally on dry or sandy soils.

HAB f-10,9? ::? C? 5. **ABU** g9 s7? -3?

1545--*Agalinis gattingeri* (Small) Small

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: *Agalinis* <Erectae>
[Gerardia] *gattingeri*

This annual is centered in the Mississippi watershed, especially on calcareous soils. It has often been confused with other species and overlooked in Ky. Some records here from western regions on relatively damp sites have been tentatively transferred from *decemloba* or *skinneriana*. Section *Erectae*--including *gattingeri*, *skinneriana* and *decemloba*--may be a largely natural group with $2n = 26$ (versus 28 in other eastern *Agalinis*). But recent molecular evidence indicates that *gattingeri* does not fit clearly into *Erectae*, and that reticulate evolution may be involved (Pettengill & Neel 2008).

In published keys it is sometimes hard to use the generally distinctive "yellowish-green" color of *Erectae*, "not tending to blacken in drying" and with the calyx-tube remaining "evidently reticulate-veinose" (Pennell 1935). *A. gattingeri* often has a slightly dark color, but not uniformly developed. Another useful character of *Erectae* in Tenn. and Ky. (D. Estes, pers. comm.) is that bracteal leaves are shorter than pedicels (versus longer in almost all other *Agalinis*).

HAB f-10,12,9? ::? D 5. **ABU** g9 s8 -3.

1546--*Agalinis skinneriana* (Wood) Britt.

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: *Agalinis* <Erectae>
[Gerardia] *skinneriana*

This globally rare annual is known from scattered midwestern localities (PL, K). In Ky. it is known from a few colls. made mostly during 1930-1980, and some of these have been uncertain or dubious (M). There has been confusion with other species, especially *gattingeri*. Apart from the two or three verified Ky. records, *skinneriana* is virtually unknown east of the Mississippi Rv. and Ohio Rv. There is one report from Miss. (K), one from Tenn. at Fort Campbell (but not May Prairie; D. Estes, pers. comm.), and one from Md. (Pettengill & Neel 2008).

HAB f-10,12,9? ::? C? 5. **ABU** g6? s3? -4?

1547--*Agalinis decemloba* (Greene) Pennell

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: *Agalinis* <Erectae>
[Gerardia] *decemloba* ("*obtusifolia*")

This annual occurs on foothills and plains around the central and southern Appalachians. It is close to *A. obtusifolia* Raf., a species of the southeastern Coastal Plain that has been sometimes combined or confused, and thus reported from Ky. Distinction is supported by recent molecular evidence (Pettengill & Neel 2008). There has also been confusion with *gattingeri*, to which colls. from CALL are here reassigned (Woods 1983; M).

HAB 10 ::? A 5. **ABU** g7 s3 -4?

1548--*Tomanthera auriculata* (Michx.) Raf.

Orobanchaceae <Gerardieae> [Scrophulariaceae*]: *Tomanthera* [Gerardia]
auriculata

In Ky. this largely midwestern annual is known only from prairie remnants of Fort Campbell in CHRI and the Chalk Ridge area in LEWI. Short (1840) also collected in from "wet lands in the barrens" (perhaps CHRI, check PH). In Tenn. it is also known from Montgomery Co., adjacent to TRIG and CHRI (Ch). Some recent authors have favored combining this monotypic genus with *Agalinis* (Cr, W); $2n = 26$.

HAB 10 ::? D? 5. **ABU** g5 s2 -5.

1549--*Buchnera americana* L.

Orobanchaceae <Buchneraeae> [Scrophulariaceae*]: *Buchnera americana*

This is widely scattered over southeastern states, but generally restricted to good remnants of native grassland. In Ky. most records are from non-calcareous soils, but the species is associated with calcareous soils elsewhere

(W). In addition to verified colls. from southern regions of the state, there is an old report from the JEFF area (McMurtrie 1819). North of Ky. Buchnera occurs only in a few counties of s. Ohio and locally on the south side of the Great Lakes in n. Ill. to s. N.Y. (K).

HAB 10,12,9 ::? C? 5. **ABU** g8 s6 -4.

1550--Schwalbea americana L.

Orobanchaceae <Cymbarieae> [Scrophulariaceae*]: *Schwalbea americana* (australis)

Plants of this southeastern species from Ky. were placed in the segregate named *S. australis* by Pennell (1935), but that taxon has generally not been distinguished by subsequent authors; $2n = 32$ and 36 . In Ky. *Schwalbea* is known only from two colls. of B in MCRE. This globally endangered species is known to be highly dependant on fire or other disturbance to maintain open grassy woodland, especially on seasonally damp, sandy soils with pines and oaks (e.g. Townsend 1997).

HAB 9,10 ::? A? 5. **ABU** g3? s0 -6.

1551--Castilleja coccinea (L.) Spreng.

Orobanchaceae <Castillejeae> [Scrophulariaceae*]: *Castilleja coccinea*
This tetraploid ($2n = 48$) annual (or biennial) is widely scattered in eastern North America, but usually restricted to remnants of native grassland on dry or damp base-rich soils. Within Ky. the only known secure populations are in glades of LARU and LEWI, and in an old cemetery of ROCK that is mowed annually before Memorial Day (May 31). The closely related diploid perennial of more western regions, *C. sessiliflora* Pursh, was reported from Ky. by BA in error (M).

HAB 10,12,9 ::? D 5. **ABU** g10 s2 -5.

1552--Melampyrum lineare Desr. var. americanum (Michx.) Beauverd

Orobanchaceae <Rhinantheae> [Scrophulariaceae*]: *Melampyrum lineare* var. *americanum*

The only plants referable to this northeastern annual that are currently known in Ky. are along trails close to Sky Bridge at Red River Gorge in WOLF. Old unverified records come from McMurtrie (1819), Rafinesque (1840) and later authors. There is also a coll. from ROWA (MDKY) with dubious label data (Campbell et al. 1992).

There has been uncertainty about the treatment of varieties within *M. lineare*, and the plants mapped here have been named var. *lineare* or var.

pectinatum (Pennell) Fern. by some authors. The more northern var. *lineare* may not be worth distinguishing, but var. *pectinatum* is a more distinct taxon known only from the Atlantic Coastal Plain (W).

HAB 12 :: A 4. **ABU** g8 s2 -4?

1553--Melampyrum lineare Desr. var. latifolium Bart.

Orobanchaceae <Rhinantheae> [Scrophulariaceae*]: *Melampyrum lineare* var. *latifolium*

In Ky. this Appalachian taxon is known only from oak woods on sandstone ridges of Cumberland Mt. in BELL and HARL.

HAB 12 ::? A 4. **ABU** g8 s3 -3?

1554--Pedicularis lanceolata Michx.

Orobanchaceae <Rhinantheae> [Scrophulariaceae*]: *Pedicularis lanceolata*
This northeastern biennial (or short-lived perennial) of base-rich wet grasslands and shores is known from sw. Ohio, nw. Tenn. and parts of other states close to the Ky. borders. However, it has been unknown within the state for at least 50 years. The confirmed coll. of C.W. Short (KY) was from "wet barrens of Ky." and probably came from the vicinity of Hopkinsville in CHRI (M). A coll. of Pr from WARR or EDMO has not been located (check MO). A coll. from ROWA (MDKY) may have dubious label data (Campbell et al. 1992).

HAB 9,2 E 5. **ABU** g9 s0 -6.

1555--Pedicularis canadensis L.

Orobanchaceae <Rhinantheae> [Scrophulariaceae*]: *Pedicularis canadensis*
This rhizomatous perennial is widely scattered over eastern and central North America, usually in thin woods on medium acid soils.

HAB 7,11,4? C 3. **ABU** g10 s9 -2.

1556--Conopholis americana (L.) Wallr. f.

Orobanchaceae <Rhinantheae> [Scrophulariaceae*]: *Conopholis americana*
This is a widespread parasite of red oaks (*Quercus* sect. *Erythrobalanus*) in eastern North America, but absent west of the Mississippi Rv. *Conopholis* is a North American genus traditionally considered close to *Orobanche*, recent research indicates more affinity with *Pedicularis* (citations of W).

HAB 11,7,5 C 1. **ABU** g10 s10 -2.

1557--Orobanche ramosa L.

Orobanchaceae <Orobancheae> [Scrophulariaceae]: *Orobanche ramosa*

The first reports of his Eurasian parasite in North America were during 1840-1890 from Ky. (Gm). There are also records from Ca., Tex., N.C. and Va. (Musselman 1985, Musselman & Bolin 2008; PL). It became most problematic on hemp, but also occurs on tobacco and occasionally other plants, especially Brassicaceae and Solanaceae. It has apparently declined in Ky. since the end of the hemp industry, but has survived locally on tobacco grown for seed, e.g., on the farm of J. Van Shipp in WOOD.

The related species, *O. minor* J.E. Smith, is known from w. Va. and s. W.Va. (K, SE, W). It differs in the calyx, divided to base into two lobes, these each usually 2-lobed (versus usually with 4 equal lobes about half as long as tube).

ALI EU. **HAB** H-10 ::: E? 6. **ABU** +4<.

1558--*Orobanche riparia* L.T. Collins

Orobanchaceae <Orobancheae> [Scrophulariaceae]: *Orobanche riparia* ("ludoviciana")

Although these plants were initially identified as the more western *O. ludoviciana* Nutt., they have now been described as a distinct species by Collins et al. (2009; see also H. Uhlich at www.owiki.org). *O. riparia* has flowers with distinctly acute calyx lobes and strongly curved corolla, produced in Aug-Oct (versus Apr-Aug). It is known along larger streams and rivers in or near the southern Great Plains and (somewhat disjunct) in east-central states from Ill. and Tenn. to Va. In the east, it is known only along or near the central Mississippi, Sangamon, Wabash, lower Ohio, New, James, Shenandoah and Potomac. It grows on roots of tall annuals: usually *Ambrosia trifida* or *Xanthium strumarium*, occasionally *A. artemisiifolia*, *Nicotiana tabacum* or other species.

D. Boone (pers. comm.) has recently rediscovered this species in Hamilton Co., Ohio, but there are only a few old records from Ky. or elsewhere along the Ohio Rv. Collins al. cited a coll. from PEND: Chicoine #4745, 27 Nov 1942, Ohio Rv. banks at Ivor. B's report of *ludoviciana* from PEND must also belong here, but there is no coll. at US. An old coll. from DAVI (KY ex. Agr. Sch.) also appears to be this species: Geo. M. Taylor, 1 Oct 1902, at Maceo [near Ky. 231 bridge across Ohio Rv.] "on tobacco."

HAB 1,4,6? ::? D 6. **ABU** g5? s1? -5?

1559--*Orobanche uniflora* L.

Orobanchaceae <Orobancheae> [Scrophulariaceae]: *Orobanche* <*Thalesia*> *uniflora* (var. u.)

Although widespread in most humid temperate regions of North America, this species is curiously uncommon in central and lower sections of the Mississippi Rv. watershed (K). Within Ky. this species is largely restricted to Appalachian regions or adjacent hills. This is the only North American species of *Orobanche* that is restricted to woodlands, where it is reportedly parasitic on several kinds of plant (F, Cr), including Saxifragales and Asterales.

HAB 7,5,4? ::? C 2. **ABU** g10 s8 -2.

1560--*Epifagus virginiana* (L.) W. Bart.

Orobanchaceae <Orobancheae> [Scrophulariaceae]: *Epifagus virginiana*
This monotypic species is a widespread parasite of beech in eastern North America.

HAB 5,7,11 C 1. **ABU** g10 s9 -3.

1561--*Plantago cordata* Lam. R

Plantaginaceae (sensu stricto): *Plantago* <*Palaeopsyllium*> *cordata*
This tetraploid (2n = 24) perennial appears to have decreased greatly across most of its original range, centered in the mid-west. There are old colls. from Ky. made by A. Michaux (1803; *P. kentuckiensis* Michx. at Paris), C.S. Rafinesque (1836, 4:11; *P. albiflora* Raf. perhaps lost), R. Peter (PH), and C.W. Short (NY). However, few clues about localities can be derived from these records. The species is semi-aquatic and is usually associated with the shores of medium-sized streams on fine-textured, base-rich substrate. It is likely that persistent livestock and other disturbances have contributed to its decline.

HAB 6,1? ::? D? 4? **ABU** g5 s1 -5.

1562--*Plantago major* L.

Plantaginaceae (sensu stricto): *Plantago* <*Plantago*> *major* (var. m.)
Although this variable perennial (2n = 12 and 24) has often been considered alien in North America, there appear be to native races (F, W). *P. major* has often been reported from Ky. based on misidentification of the closely related native, *rugelii*. It is verified only from a railroad yard in JEFF (M. Medley #6666-82 for WKY); also, Gm noted occasional seeds found in forage seed samples. It is locally common in s. Ohio, and should be expected across n. Ky. along larger roads and railroads. It is much more common in northern states, where it was reportedly known as "whiteman's foot" by native people (F).

ALI EU. **HAB** S-10 :: D? 6? **ABU** +4.

1563--Plantago rugelii Dcne.

Plantaginaceae (sensu stricto): *Plantago* <*Plantago*> *rugelii*

This tetraploid (2n = 24) perennial is widespread across eastern and central states. *P. rugelii* is often abundant in the same kind of mowed or trampled sunny moist fertile sites as major, and these two species are often mixed in northern regions. However, major is generally absent from more mesic shady trailsides, where *rugelii* can be quite common. B noted that var. *asperula* Farw. can often be distinguished but that intermediates occur; that variety is not recognized in recent treatments.

HAB s-10,7 ::: D 4. **ABU** g10 s10 +1?

1564--Plantago lanceolata L.

Plantaginaceae (sensu stricto): *Plantago* <*Lancifolia*> *lanceolata*

This diploid (2n = 12) perennial is a cosmopolitan weed in temperate regions. In Ky. it is typical of mowed pastures, meadows and lawns, and may have been present in the Ohio Valley early after settlement (Gray 1864). However, Gm indicated that he first observed it in 1898, and that its spread was promoted due to "the seeds constantly present among clover seeds."

ALI EU. **HAB** S-10 :: D 5. **ABU** +6.

1565--Plantago virginica L.

Plantaginaceae (sensu stricto): *Plantago* <*Virginica*> *virginica*

This tetraploid (2n = 24) annual is widespread in eastern and central states, especially on sandy soils.

HAB S-10 ::: C 6. **ABU** g10 s10 +2?

1566--Plantago rhodosperma Dcne. W

Plantaginaceae (sensu stricto): *Plantago* <*Virginica*> *rhodosperma*

This southwestern annual is a close relative of *virginica* that may occur in eastern states only as an adventive waif (Cr, W). There is only one record from Ky., a coll. of O'Dell & Windler from CALL (#2360 at SIU; Mohlenbrock et al. 1966).

ALI W. **HAB** S-10? ::: C? 6. **ABU** +4.

1567--Plantago pusilla Nutt.

Plantaginaceae (sensu stricto): *Plantago* <*Micropsyllium*> *pusilla* ("elongata")

This is widespread across southern states, but may be largely adventive in some eastern states (F, W). In Ky. the earliest record was due to Short (1840), who noted "frequent in the pastures of Christian county." *P. pusilla* is close to

heterophylla and some records should be rechecked; both species are diploid (2n = 12) annuals.

ALI w. **HAB** S-10? ::: C? 6. **ABU** g10 s8 +1?

1568--Plantago heterophylla Nutt. R

Plantaginaceae (sensu stricto): *Plantago* <*Micropsyllium*> *heterophylla*

This is a southeastern species that extends north into the central Mississippi Valley, and adventive beyond. M has reported it from MARS (#13773-86 for WKY). Woods' (1983) report from HICK (MUR) was based on a misidentified coll. of *pusilla*.

HAB S-10? ::: B? 6. **ABU** g10 s5? -1?

1569--Plantago aristata Michx.

Plantaginaceae (sensu stricto): *Plantago* <*Gnaphaloides*> *aristata*

This annual appears to have originally been centered in the Mississippi Valley, but became widely adventive in Appalachian and Atlantic regions (F, Cr, W). Although probably increased since Gm's time, *aristata* is still more common in western regions of the state. Some hybridization may be expected with *patagonica* (Cr); 2n = 20 in both.

ALI w. **HAB** S-10,12 ::: C 6. **ABU** g10 s10 +2?

1570--Plantago patagonica Jacq. R

Plantaginaceae (sensu stricto): *Plantago* <*Gnaphaloides*> *patagonica* (*purshii*)

This annual is native from southwestern states to South America, and it is adventive in eastern states. There have been reports from Ky. but also some confusion with *wrightiana*, and no verified coll. has been seen (M).

ALI S.

1571--Plantago wrightiana Dcne.

Plantaginaceae (sensu stricto): *Plantago* <*Gnaphaloides*> *wrightiana*

(*hookeriana* var. *nuda*)

The original range of this southern annual is uncertain. There has been confusion between this southern species and *patagonica*, and some records need to be checked.

ALI s. **HAB** S-10? ::: C? 6. **ABU** g10? s5? -1?

1572--Callitriche terrestris Raf.

Callitrichaceae [Plantaginaceae]: *Callitriche terrestris* (*deflexa* var. *austini*)

This widely scattered southern species occurs in ephemeral ponded areas of various types, from paths to wet woodlands; 2n = 10.

HAB s-9,10 :: C 4? **ABU** g10? s8? -3?

1573--Callitriche pedunculosa Nutt. R

Callitrichaceae [Plantaginaceae]: *Callitriche pedunculosa* (nuttallii*)

This species is centered in the lower Mississippi Valley and has been reported from Ky. (Sm, F), but no colls. have been located. It differs from *terrestris* in its longer pedicels (0.5-7 mm versus 0.1-0.6 mm), the fruit developing underground, with thickened, curled-over margins (W).

1574--Callitriche heterophylla Pursh

Callitrichaceae [Plantaginaceae]: *Callitriche heterophylla*

This is widely scattered over North America in pools and slow streams; 2n = 6.

HAB 2,9 ~ C 6. **ABU** g10 s8? -3?

1575--Callitriche palustris L. R

Callitrichaceae [Plantaginaceae]: *Callitriche palustris* (verna)

This northern (circumboreal) species has been reported from Ky., but no verified coll. has been seen. B's coll. from MCRE (US), and others with this name, appear to be *terrestris* instead, but further checking may be needed. *C. palustris* is close to *heterophylla* but differs in its more elongated, ellipsoid fruits (versus obovoid or almost cordate); 2n = 20.

1576--Utricularia cornuta Michx. R

Lentibulariaceae: *Utricularia cornuta*

The main range of this eastern species is to the north, but it is also widespread to the east and south of Ky. There is a coll. from ROWA (MDKY) labeled: K. Carr #570, 20 Aug 1936, sandy creek bank, Elliottsville. However, these data may be doubted (Campbell et al. 1992). Unlike other species of *Utricularia* reported from Ky., *cornuta* is generally attached to soil, with minute bladders on roots and minute linear leaves usually hidden below ground (versus dissected and conspicuous on floating stems); 2n = 18.

1577--Utricularia radiata Small R

Lentibulariaceae: *Utricularia radiata* (inflata* var. minor)

In recent years, *U. inflata* Walt. has been reported to KSNPC from CASE, LAUR and POWE by T. Barnes (pers. comm.) and others, but colls. have not yet been seen. The plants in POWE were established artificially in a pond (D. Dourson, pers. comm.), but those in LAUR appear to be native. *U. inflata*, in its strict sense, is largely restricted to the Coastal Plain (W). It is replaced

inland by the closely related *U. radiata*, which is more widely distributed in eastern states and probably includes any Ky. plants; 2n = 28.

HAB 2 ~ C? 6. **ABU** g9? s2 -4?

1578--Utricularia gibba L.

Lentibulariaceae: *Utricularia gibba* ("biflora", "fibrosa")

This is widely scattered in eastern states, and also occurs in Pacific states and Central America. Plants known as *U. biflora* Lam. and *U. fibrosa* Lam. may generally be included in *gibba*, but further taxonomic work is needed (Cr, W). There are no reliable records from Ky. of those other two taxa (M).

HAB 2 ~ C 6. **ABU** g10 s7 -2.

1579--Utricularia macrorhiza Le Conte

Lentibulariaceae: *Utricularia macrorhiza* ("vulgaris")

This is widely scattered over North America, but it is uncommon to rare in southeastern states (Cr, W). It is closely related to the Eurasian species, *U. vulgaris* L., and combined by some authors; 2n = 44.

HAB 2 ~ D? 6. **ABU** -2?

1580--Justicia lanceolata (Chapman) Small

Acanthaceae: *Justicia lanceolata* (ovata* var. 1.)

This occurs mostly on the Gulf Coastal Plain and upstream into the central Mississippi Valley; the closely related species, *J. ovata* (Walter) Lindau, is restricted to the Coastal Plain from Ala. to Va. (W). Both species usually occur along shorelines of sluggish or stagnant waters. *J. lanceolata* differs in its lax spikes with single secund flowers (versus congested with opposite pairs of flowers), its smooth seeds (versus minutely muricate), and its more elongated leaves (l/w = ca. 5 versus 3).

HAB 2 ~ D? 6. **ABU** g8 s5 -3.

1581--Justicia americana (L.) Vahl

Acanthaceae: *Justicia americana*

This is widespread in eastern states, especially in riffles of streams, but it is uncommon to rare in some coastal regions.

HAB 1 ~ D 6. **ABU** g10 s10 -1.

1582--Dicliptera brachiata (Pursh) Spreng.

Acanthaceae: *Dicliptera* [*Justicia*] *brachiata*

This southeastern annual or short-lived perennial (?) is most frequent in the central and lower Mississippi watershed (F, Cr, W). It is known from s. Ind.,

and may be overlooked on lowlands in the Shawnee Hills of Ky. *D. brachiata* usually grows in less disturbed woods on damp fertile soils of riverine floodplains. It is probably the most shade tolerant species of Acanthaceae in eastern states; $2n = ca. 80$.

HAB 6,7 D 2. **ABU** g9 s6 -3.

1583--*Ruellia strepens* L.

Acanthaceae: *Ruellia strepens*

This is a widespread species of east-central states, Variation may deserve further study. A coll. from WAYN (KY) has creamy white flowers, and a pure white form was seen in HARR (Griffith Woods) during 2006. Also, the incidence of cleistogamy seems to vary widely in space and time.

HAB f-10,7,4 D 4. **ABU** g9 s9 -3.

1584--*Ruellia pedunculata* Torr. ex Gray

Acanthaceae: *Ruellia pedunculata*

This largely Ozarkian species was recently collected on sandstone outcrops along roads southwest of Joy in LIVI (JC for KY; M. Homoya for WKY). It has also been reported by McFarland (1942) and Grubbs (1989), but the latter was based on a misidentified coll. of *caroliniensis* from HICK.

Disjunct relatives of *pedunculata* to the east of Ky. have been segregated as *R. purshiana* Fern. and *R. pinetorum* Fern. (W). *R. purshiana* occurs close to Ky. in the Ridge-and-Valley of w. Va. and ne. Tenn., but is unknown within the state.

HAB 12,10 +? C? 4. **ABU** g8 s2 -4?

1585--*Ruellia caroliniensis* (J.F. Gmel.) Steud.

Acanthaceae: *Ruellia caroliniensis* (*parviflora*)

This is widespread in southeastern states but perhaps absent west of the Mississippi Rv. (Wasshausen 1998). Intraspecific taxa have not been recognized in most recent treatments, but variation deserves further study. Records mapped here include many colls. that have been referred to var. *parviflora* (Nees) Blake. A coll. from SCOT (DHL) was referred to var. *membranacea* Fern. See also notes under *ciliosa* and *humilis*, which may both intergrade with *caroliniensis*. Note that only one chromosome number ($2n=34$) has been reported for North American *Ruellia*.

HAB f-10,7 C 4. **ABU** g10 s10 -2.

1586--*Ruellia ciliosa* Pursh R

Acanthaceae: *Ruellia ciliosa* (*caroliniensis* ssp. *ciliosa*)

Although the circumscription of this taxon needs further attention, *ciliosa* does seem to be distinct. It is locally abundant on the southeastern Coastal Plain east of the Mississippi Rv., but not well documented in Ky. or Tenn. (W). Sm treated *ciliosa* as a species, with subsessile or sessile leaves like *humilis*, upright habit like *caroliniensis*, dense spreading pubescence (typically more hairy than *humilis* or *caroliniensis*), and often larger flowers (up to 5-7 cm long). More recently, W has also treated it as a species, but closer to *caroliniensis*; and Ward (2007) treated it as *R. caroliniensis* ssp. *ciliosa* (Pursh) R.W. Long, a "dimorphic or heteromorphic" taxon.

There are several old or obscure colls. from Ky. that have been referred to *ciliosa* (M). These include colls. of BA from CHRI (TENN), B from EDMO (US), and McFarland from HART (TENN). Some colls. may not be particularly distinct, or in some cases they may be transitions to *humilis*, with which there has been much confusion in older treatments (D, B, F).

1587--*Ruellia humilis* Nutt.

Acanthaceae: *Ruellia humilis*

This occurs in east-central states on dry soils of diverse types, but usually calcareous in Ky. Variation needs further study. Most plants in Ky. lack dense long hairs, and, using older treatments (F, St, Cr), they would be referable to var. *humilis* f. *grisea* Fern. or var. *calvescens* Fern. The latter was considered largely Appalachian by F, who applied the name to colls. from FLEM (GH) and ROBE (B), but similar glabrescent plants are widespread in the Interior Low Plateaus of Ky. (M) and Tenn. A coll. from PEND (US) was det. by F as the largely midwestern var. *frondosa* Fern. And a coll. from JESS (KY) has been referred by BA to var. *longiflora* (Gray) Fern., but that has been considered a taxon of the central to lower Mississippi Valley. There may also be transitions to *caroliniensis*, which was confused in earlier nomenclature; see notes under *ciliosa*.

HAB f-12,10 + E 5. **ABU** g9 s8 -3.

1588--*Verbena urticifolia* L.

Verbenaceae: *Verbena urticifolia*

This widespread eastern species is perennial, but perhaps short-lived (Cr). All plants in Ky. are probably the typical variety. Many colls. have hairy leaves, but none appear to be velutinous as in var. *leiocarpa* Perry & Fern. Hybrids are expected with *hastata* and others (F, Cr); most eastern species of *Verbena* contain diploids ($2n = 14$).

HAB f-7,8,4,6 D 4. **ABU** g10 s10 -2?

1589--*Verbena hastata* L.

Verbenaceae: *Verbena hastata*

This tall wetland perennial is widespread across eastern and central North America. Apparent hybrids with *urticifolia* are collected from JEFF (MM for WKY) and UNIO (R. Athey colls. to locate at EKY or MEM).

HAB f-9,2? C 4. **ABU** g10 s9 -3.

1590--*Verbena stricta* Vent.

Verbenaceae: *Verbena stricta*

This widespread species of the Great Plains is adventive in Atlantic states (Cr, W).

ALI w. **HAB** R-10 ::? D? 6. **ABU** g10 s8 -1?

1591--*Verbena officinalis* L. ? R

Verbenaceae: *Verbena* cf. *officinalis* (*spuria*)

This variable species (2n = 14 to 56) is generally considered to have originated in south-central Europe, and spread to temperate regions of North America after 1492, with records concentrated in coastal states (Nesom 2010a). The historical record suggests that *officinalis* became widely cultivated for medicinal use during the early period of settlement, then locally naturalized but declined somewhat during the past century. However, it remains possible that some native plants similar to European *officinalis* existed in North America before 1492.

There are distinctive native allies of *officinalis* in more southern and western regions (Nesom 2010a). Some additional segregates in east-central states were recognized by early botanists, but combined by Nesom. These include *V. spuria* L., which Short (1840) reported from Ky. along "roadsides in the barrens, in common with *V. angustifolia* [= *simplex*]"; see also *V. riparia* Raf. of riverbanks in Va., N.C. and Tenn. (Cr, K, W). Other than Short's record, there are no other records of *officinalis* or its segregates from Ky.

ALI eu?

1592--*Verbena simplex* Lehm.

Verbenaceae: *Verbena simplex* (*angustifolia*)

This is a widespread weedy species of dry base-rich soil in eastern states, often along roadsides as well as more natural rocky habitats.

HAB R-10,12? ::: D 6. **ABU** g10 s10 +1?

1593--*Verbena bracteata* Lag. & Rodr.

Verbenaceae: *Verbena bracteata*

This procumbent annual or short-lived perennial of disturbed places is widespread across North America, but it is often considered adventive in more eastern regions (Cr, W). In 1914, Gm noted: "observed only along the Ohio River." It is still largely restricted to counties along the river. *V. bracteata* is a variable species (2n = 14 and 28), and hybrids are expected with other species (Cr).

HAB r-1,10? ::? C? 6. **ABU** g10 s7 -3?

1594--*Verbena brasiliensis* Vell.

Verbenaceae: *Verbena* <*Verbenaca*> *brasiliensis*

This tall annual is a tetraploid (2n = 28) that is adventive from South America. Also, it escapes sometimes from plantings as an attractive but erroneous "wild flower"; such misinformed use has increased within recent years. Hybrids are unknown. The related species, *V. bonariensis* L., may also be expected but generally does not extend as far north (SE, W).

ALI SA. **HAB** H-10 ::? D? 6. **ABU** +4.

1595--*Glandularia pulchella* (Sweet) Troncoso C

Verbenaceae: *Glandularia* [*Verbena**] *pulchella* (*tenuisecta*)

This South American weed has become common in the southern U.S.A., and is often cultivated in flower gardens, but it does not seem to be spreading significantly in Ky. The only record is a coll. from RUSS (at Field Museum): E. Roy #20, Aug 1961, "Escape! Roadside... ca. 5 miles w. of Russell Springs."

ALI SA. **HAB** R-10,12? ::? C? 6. **ABU** +4.

1596--*Glandularia bipinnatifida* (Nutt.) Nutt.

Verbenaceae: *Glandularia* [*Verbena**] *bipinnatifida*

This is a southwestern species that appears to be local or rare in southeastern states. Sm did not include it for states east of the Mississippi Rv. Adventive status has been suspected in some cases, as in the single record from Ky., from a vacant house lot in JEFF (DHL).

ALI W. **HAB** R-12,10? ::? E? 6. **ABU** +4.

1597--*Glandularia canadensis* (L.) Nutt.

Verbenaceae: *Glandularia* [*Verbena**] *canadensis*

This is a widespread native in southern and midwestern states, but it appears adventive or escaped from cultivation in more northeastern states. It is locally common and apparently native in c. Tenn., together with a more robust variant also expected in Ky. (D. Estes, pers. comm.). In Ky. some western records are from more or less native grassy vegetation, but most northern records are from weedy roadsides, abandoned lots or similar places. The earliest record was a listing by McMurtrie (1819), under the old synonym *Verbena caroliniana* L. (Britton & Brown 1896). In 1914 Gm noted: "brought from farther south. Native?" See also *G. X hybrida* (Grönland & Rümpler) Nesom & Pruski. **ALI** w. **HAB** R-10,12 ::? D? 6. **ABU** g10 s7 -2?

1598--*Glandularia ×hybrida* (Grönland & Rümpler) Nesom & Pruski C

Verbenaceae: *Glandularia* [*Verbena**] X *hybrida*

This is an cultivated ornamental hybrid that occasionally escapes. *G. canadensis* is one of the parents, but the other remains uncertain; 2n = 30 in most *Glandularia* species (Cr, W). In Ky. there are colls. from LYON and TRIG (APSU).

ALI S. **HAB** H-10 ::? C? 6. **ABU** +4.

1599--*Phyla lanceolata* (Michx.) Greene

Verbenaceae: *Phyla* [*Lippia*] *lanceolata*

This is a widespread sprawling plant of marshy places and shorelines across eastern and central North America. Variation may deserve further attention (2n = 32 and 36). In Ky. much material has been referred to var. *recognita* (Fern. & Grisc.) Soper, but that taxon is not recognized in recent treatments, and B considered most of her colls. intermediate.

HAB s-9,2,1 :: D 6. **ABU** g10 s9 -2.

1600--*Phyla nodiflora* (L.) Greene R

Verbenaceae: *Phyla* [*Lippia*] *nodiflora*

This pantropical species was reported from Ky. by RAB and Moldenke (1980), but no coll. has been located. There has been some confusion with *lanceolata*, but *nodiflora* is distinct (2n = 36) and it should be expected in western regions of the state.

1601--*Lindernia dubia* (L.) Pennell var. *dubia*

Linderniaceae (Scrophulariaceae*): *Lindernia dubia* var. d.

This is a variable species, widespread across North and South America; 2n = 18 and 32. Var. *anagallidea* is often considered somewhat distinct (see below), but colls. from BRAC (KNK), KENT (KNK) and perhaps elsewhere may be

intermediate. Several colls. from Ky. have been referred to var. *major* Pennell (1935), but that taxon has not been recognized in subsequent treatments.

Lindernia dubia is often confused with *Gratiola neglecta*; both grow in varied types of shoreline, ditches and drying pools. In addition to its pair of sterile stamens, lack of bracteoles (subtending calyx), and shorter calyx (F, Cr), *L. dubia* usually has glabrous stems (versus glandular-pubescent), leaves widest below the middle (versus at or above), a more diffusely branched sprawling habit, and later flowering (mostly Jul-Sep versus May-Jul), which often becomes cleistogamous (versus all chasmogamous).

HAB s-9,2 ::: D 6. **ABU** g10 s10 -1?

1602--*Lindernia dubia* (L.) Pennell var. *anagallidea* (Michx.) Cooperr.

Linderniaceae (Scrophulariaceae*): *Lindernia dubia* var. *anagallidea*

This often occurs with typical *dubia*, and there is little geographic segregation, but it generally appears distinct. Var. *anagallidea* tends to have mostly rounded leaf bases (versus cuneate), longer pedicels (mostly 1-2.5 cm versus 0.5-1.5 cm) that exceed leaves (versus about equal), no cleistomagy, and less elongated seeds (l/w ca. 1.5-2 versus 2-3). It tends to occur in less weedy situations, and perhaps in deeper pools.

HAB 2 ::: D 6. **ABU** g10 s8 -1?

1603--*Mazus pumilus* (Burm. f.) Steenis

Phrymaceae (Scrophulariaceae*): *Mazus pumilus* (japonicus)

This East Asian annual is a widespread, variable weed of rice fields, damp lawns and similar disturbed areas in warmer regions (2n = 12-52). In Ky. it may only be an occasional adventive.

ALI AS. **HAB** H-10,9? ::: E? 6. **ABU** +4.

1604--*Mimulus alatus* Ait.

Phrymaceae (Scrophulariaceae*): *Mimulus alatus*

This is widespread on wet fertile soils in eastern states. It is close to *ringens* and hybrids have been reported elsewhere (Cr), but never from Ky. (2n = 22 versus 24). A coll. from MARS (MUR) has been referred to "var. *nervosa*" and a coll. from HICK (MUR) to forma *albiflorus* House, but these taxa have not been recognized in recent treatments.

HAB 9,2,1 D 5. **ABU** g10 s10 -3.

1605--*Mimulus ringens* L.

Phrymaceae (Scrophulariaceae*): *Mimulus ringens*

This is widespread on wet acid soils in eastern and central North America, but rare to absent from the Gulf Coastal Plain to Tex.

HAB 9,2 C 5. **ABU** g10 s8 -3.

1606--Phryma leptostachya L.

Phrymaceae: Phryma leptostachya

Broadly defined, this is a monotypic species, widespread in eastern North America and also occurring in East Asia (2n = 28).

HAB 7,5,4,6 D 2. **ABU** g10 s10 -3.

1607--Callicarpa dichotoma (Lour.) K. Koch C

Lamiaceae (uncertain position): Callicarpa dichotoma

This ornamental shrub is spreading in southeastern states, especially the Carolinas (W). In Ky. it was recently reported for the first time, escaped in MADI (Clark et al. 2005; CW). The southeastern native, *C. americana* L., is unknown in Ky., but it is frequent across Tenn. beyond 30-50 miles south of the state line (Ch).

The transfer of *Callicarpa* from Verbenaceae to Lamiaceae is based on recent molecular data, but its position within Lamiaceae remains uncertain (Kadereit 2004; W).

ALI AS.

1608--Vitex agnus-castus L. C

Lamiaceae <Viticoideae> (Verbenaceae*): *Vitex agnus-castus*

This is the widely cultivated "Chaste Tree" that was much used by medieval monks. There is no clear evidence of escaped plants, though a roadside coll. from HENR (DHL) has been cited (M).

ALI EU.

1609--Vitex negundo L. C

Lamiaceae <Viticoideae> (Verbenaceae*): *Vitex negundo*

This is occasionally cultivated but rarely escapes in eastern states. In Ky. the only potentially wild coll. is from a corn field in JEFF (DHL).

ALI AS.

1610--Ajuga reptans L.

Lamiaceae <Ajugoideae>: *Ajuga reptans*

This mat-forming stoloniferous ornamental is frequently planted in northeastern regions, often persists and may sometimes escape. In Ky. some

of the mapped records may not be from truly naturalized plants in wilder sites.

A. genevensis L. is a more erect, non-stoloniferous relative of reptans that may also be expected, together with hybrids (Cr, W); 2n = 32 in both.

ALI EU. **HAB** S-10,7 ::? E 4. **ABU** +4.

1611--Teucrium canadense L. var. canadense

Lamiaceae <Ajugoideae>: *Teucrium canadense** var. c.

This taxon occurs along the Atlantic and Gulf Coastal Plains, and up into the central Mississippi Valley. In Ky. some colls. (at MUR) appear transitional to var. *virginicum*. An atypical coll. from HICK (MUR) has leaves only 1-1.5 cm wide, and bracts ca. 15 x 3 mm, mostly longer than flowers.

HAB f-6,4,1? D 4. **ABU** g9 s5? -3?

1612--Teucrium canadense L. var. virginicum (L.) Eat.

Lamiaceae <Ajugoideae>: *Teucrium canadense** var. *virginicum*

This taxon is widespread in temperate regions of North America. A coll. from HARD was referred to the northern and western var. *occidentalis* (Gray) McClintock & Epling by Cranfill (1991), but this has not been verified.

HAB f-8,7,6,4 D 4. **ABU** g10 s10 -1?

1613--Isanthus brachiatus (L.) B.S.P.

Lamiaceae <Ajugoideae>: *Isanthus* [= *Trichostema*] *brachiatus*

This is widely scattered over eastern and central states, but generally restricted to limestone or other base-rich outcrops. *Isanthus* [= *Trichostema* sect. *Orthopodium*] is often considered to be a monotypic genus distinct from

Trichostema (F, Cr; see notes of W).

HAB 12 == E 6. **ABU** g9 s9 -2.

1614--Trichostema dichotomum L.

Lamiaceae <Ajugoideae>: *Trichostema dichotomum* (var. d.)

This is a widespread eastern species of dry sandy soils.

HAB f-12,10 +:: B 6. **ABU** g10 s9 -1?

1615--Trichostema setaceum Houtt.

Lamiaceae <Ajugoideae>: *Trichostema setaceum* (*dichotomum* var. *lineare*)

This southeastern species is generally distinct from typical *dichotomum*, but some colls. from Ky. need checking. There may be some intergradation in the state; 2n = 38 in both taxa.

HAB r-12? +:: B 6. **ABU** g9? s5 -2.

1616--*Scutellaria ovata* Hill

Lamiaceae <Scutellarioideae>: *Scutellaria ovata* (ssp. o.)

Variation in this widespread species of east-central states was detailed by Epling (1942), but has been dealt with in different ways by subsequent authors. Using F and Cr, most plants in Ky. have been referred to the largely midwestern var. *versicolor* (Nutt.) Fern., which has relatively broad leaves (8-12 cm versus 5-8 cm) and short bracts, compared to more southwestern plants that have been known as var. *ovata* or var. *bracteata*. However, recent revision by B.A. Sorrie and Weakley (W) has now indicated that the type of *ovata* should be included with *versicolor* rather than *bracteata*.

Further study is needed in the state, and some colls. mapped here should probably be transferred to *bracteata*. Also, using Epling and Cr, a few colls. with relatively sparse eglandular (versus dense glandular) hairs have been treated as var. *calcareae* (Epling) Gleason (including ssp. *pseudovenosa* Epling). Epling and Cr distinguished that taxon in Ky., Tenn. and N.C., but F and W have included it with var. *versicolor*.

HAB 11,7,5 E 2. **ABU** g9? s8 -3.

1617--*Scutellaria ovata* Hill ssp. *bracteata* (Benth) Epling T

Lamiaceae <Scutellarioideae>: *Scutellaria ovata* ssp. *bracteata*

This taxon may be centered in the central and lower Mississippi watershed (Epling 1942). B.A. Sorrie and Weakley (W) have recently indicated that its most distinctive character is the lower lip of its flowers, which is cleft and erose (versus entire), bearing large lateral auricles (versus undulate or weakly auriculate). See notes under *ovata*. In Ky. there are verified colls. from EDMO, HART and HICK (NCU, WKY), and more colls. probably exist under *ovata*, sensu lato.

HAB 11,7,5 E 2. **ABU** g8? s4? -3?

1618--*Scutellaria arguta* Buckl. T

Lamiaceae <Scutellarioideae>: *Scutellaria arguta* (*saxatilis* var. *pilosior*)

This southern Appalachian taxon is verified only from Tenn., Va., N.C. and Ga. (Epling 1942; F, Cr, W). It has been reported from Ky. (M), but there has been confusion with *saxatilis*, and recent revision of W has indicated that *arguta* should be included as a variety within *S. ovata* ssp. *rugosa* (Wood) Epling.

Ssp. *rugosa* is not known from Ky. but might be expected in the Cumberland Mts. Compared to typical *ovata* (F, Cr, W), its relatively small corollas have a

blue lip with two white lines (versus white with a few blue spots); its leaves are smaller, rugose, usually densely hairy (versus sparse), and often purplish; plants are somewhat sprawling and relatively short, with less clear differentiation of racemes (thus resembling *saxatilis*).

HAB 11,5 + C 3. **ABU** g7 s4 -2.

1619--*Scutellaria saxatilis* Riddell

Lamiaceae <Scutellarioideae>: *Scutellaria saxatilis* (var. s.)

This uncommon plant occurs from the Appalachians north to Ind., Pa. and Del., usually on mesic slopes and terraces. Short (1837) found it on a "marshy flat at the Olympian Springs" (BATH, check PH). More hairy plants in Ky., with some glands, have been referred to *S. saxatilis* var. *pilosior* Benth. or to *S. arguta*, but probably in error; see notes under *arguta*.

In contrast to the *ovata* group (Cr, W), *saxatilis* is a somewhat decumbent plant, often spreading over logs or talus; stems usually have at least sparse curved-ascending mostly eglandular hairs (versus spreading or retrose, often glandular); leaves are truncate (versus cordate); flowers are partly axillary (versus strictly terminal) and sometimes secund.

HAB 5,11 + C 2. **ABU** g7 s5 -2.

1620--*Scutellaria incana* Biehler var. *punctata* (Chapman) C. Mohr

Lamiaceae <Scutellarioideae>: *Scutellaria incana* var. *punctata*

This smooth-leaved variety is largely restricted to southern Appalachian regions.

HAB 8,7,10 B? 4. **ABU** g8 s8 -2.

1621--*Scutellaria incana* Biehler var. *incana*

Lamiaceae <Scutellarioideae>: *Scutellaria incana* var. *i.*

This occurs in east-central states, usually in thin woods and edges on medium acid soils; it can increase greatly after fire (*M. Homoya*, pers. comm.). In Ky. distinction from var. *punctata* needs to be checked in some cases. Also, colls. from CLAR and MERC (KY) appear to be hybridized with *ovata*. A coll. from BULL (DHL) has unusually small leaves, with short petioles, suggesting hybridization with *parvula* or a related species.

HAB 8,7,10 C 4. **ABU** g9 s9 -2.

1622--*Scutellaria serrata* Andr.

Lamiaceae <Scutellarioideae>: *Scutellaria serrata*

This largely Appalachian species is rare in Ky., where it usually occurs on toe-slopes or terraces in the Appalachian Cliff Section and in the Cumberland Mts. It also known from close to BELL on Cumberland Mountain in Lee Co., Va. (mapped in GIS of J. Campbell).

HAB 5,4,11 B? 2. **ABU** g8 s5 -2.

1623--*Scutellaria elliptica* Muhl. ex Spreng. var. elliptica

Lamiaceae <Scutellarioideae>: *Scutellaria elliptica* var. e. (pilosa, ovalifolia; o. ssp. mollis)

This species occurs widely in acid soils in forests of eastern states, largely south of glaciated land. Var. *elliptica* reportedly has a more eastern range than var. *hirsuta*, though there is much overlap (F). In Ky. these taxa may not be clearly distinct in some cases, but var. *elliptica* appears restricted to Appalachian regions. Further study of colls. is needed for precise mapping.

HAB 7,11,8? B 2. **ABU** g9 s8 -2.

1624--*Scutellaria elliptica* Muhl. ex Spreng. var. hirsuta (Short & Peter) Fern.

Lamiaceae <Scutellarioideae>: *Scutellaria elliptica* var. *hirsuta*

This is concentrated in more northern and midwestern regions, in contrast to typical *elliptica*. In Ky. most plants of *S. elliptica* are clearly var. *hirsuta*, but some colls. need checking. The only obvious difference in var. *hirsuta* is the presence of glandular hairs on internodes below the inflorescence (versus short ascending non-glandular hairs). but that same character is important for diagnosis of several other related species (W). Short & Peter (1835) were also struck by the more robust overall form of their initial specimens.

HAB 7,11,8 B 2. **ABU** g9 s9 -2.

1625--*Scutellaria integrifolia* L.

Lamiaceae <Scutellarioideae>: *Scutellaria integrifolia*

This is typical of seasonally wet acid soils in southeastern states, especially east of the Mississippi Rv.

HAB 9 B 4. **ABU** g9 s8 -3.

1626--*Scutellaria lateriflora* L.

Lamiaceae <Scutellarioideae>: *Scutellaria lateriflora*

This polyploid (2n = 88) is widespread across temperate regions of North America, usually on damp fertile alluvial soils.

HAB 2,1,6,9 D 4. **ABU** g10 s9 -3.

1627--*Scutellaria epilobiifolia* A. Hamilton

Lamiaceae <Scutellarioideae>: *Scutellaria epilobiifolia* (*galericulata* var. e.)

This has a broad northern and western range, with local extension down the southern Appalachians to n. Va. Records from Tenn. (Ch) and N.C. (W) are only old or obscure. It is closely related to the Eurasian species, *S. galericulata* L. In Ky. there is only one verified record: a coll. from ROCK (KY-Agr.), 8 Jul 1915, stating "Conway, Ky." but with no collector. The species was also reported by Greenwell (1935) from NELS.

HAB 9,2? B? 4? **ABU** g10 s1 -6?

1628--*Scutellaria nervosa* Pursh var. nervosa

Lamiaceae <Scutellarioideae>: *Scutellaria nervosa** var. n.

This species mostly occurs in east-central states, centered on the Ohio Rv. watershed and central Appalachian regions. Typical *nervosa* is largely Appalachian.

HAB 7,8,4? D? 2. **ABU** g9 s9 -3.

1629--*Scutellaria nervosa* Pursh var. calvifolia Fern.

Lamiaceae <Scutellarioideae>: *Scutellaria nervosa** var. *calvifolia*

This variety--without hairs on upper leaf surfaces--may be worth recognizing, but more comprehensive revision is needed. It appears to occur mostly in lowlands to the east and west of the Appalachians.

HAB 7,8,4? D? 2. **ABU** g8? s7? -3.

1630--*Scutellaria leonardii* Epling

Lamiaceae <Scutellarioideae>: *Scutellaria leonardii* (*parvula* var. l.)

This occurs mostly on xeric calcareous sites in midwestern states. There are records from Ky. of the more eastern taxon, *S. ambigua* Nutt. (= *S. nervosa* var. *ambigua* or *S. parvula* var. *missouriensis* (Torr.) Goodman & Lawson). However, *ambigua* is combined with *leonardii* in most recent treatments (W), and the plants from Ky. may not be clearly distinct (B, F, M).

HAB 12 == E 6. **ABU** g10 s7 -2.

1631--*Scutellaria australis* (Fassett) Epling

Lamiaceae <Scutellarioideae>: *Scutellaria australis* (*parvula* var. a.)

See notes under *parvula*.

HAB f-12,10,7 +? D? 4. **ABU** g9 s8 -2?

1632--*Scutellaria parvula* Michx.

Lamiaceae <Scutellarioideae>: *Scutellaria parvula* (var. p.)

This taxon is centered in east-central states. It is close to *australis*, which has an overlapping southeastern range. Some colls. from BULL and WAYN (MDKY) may be partly intermediate.

HAB f-12,10,7 +? E? 4. **ABU** g10 s8 -2?

1633--*Marrubium vulgare* L.

Lamiaceae <Lamioideae>: *Marrubium vulgare*

This old medicinal herb ("horehound") is locally persistent in northeaster states.

ALI EU. **HAB** H-10 ::? E 6. **ABU** +4.

1634--*Physostegia virginiana* (L.) Benth.

Lamiaceae <Lamioideae>: *Physostegia virginiana** (var. v.; ?*P. formosior*)

In its broad sense, including *praemorsa*, this species is widespread across eastern and central North America (Cantino 1982). But in its strict sense, as mapped here, *virginiana* is mostly northeastern and generally associated with shorelines or other wet sites. In Ky. it is generally distinct and restricted to low rocky banks and marshy bars along larger free-flowing streams and rivers, with limestone or sandstone as bedrock. *P. purpurea* (Walt.) Blake (= *P. denticulatum* (Ait.) Britt.) is a closely related southeastern species (Cr, W).

HAB 1 C 5. **ABU** g10 s7 -2.

1635--*Physostegia speciosa* Sweet ?

Lamiaceae <Lamioideae>: *Physostegia* cf. *speciosa* (*virginiana** var. s.)

Mapping here is provisional. These widely cultivated plants may be of hybrid origin from both *virginiana* and *praemorsa* (F, Cr; Cantino 1982). Cantino did not assign a particular name to such plants, but "*speciosa*" remains a potential name pending further taxonomic work. The geographic origin of these plants is obscure, but could be the region of overlap between *virginiana* and *praemorsa*, from the Ozarks to the Appalachian Plateaus. They have been grown for many decades in flower gardens, and sometimes persist or spread into adjacent roadsides. Records mapped here are mostly from roadsides in valleys of Appalachian regions and the Knobs. Virtually none are from more natural vegetation.

Based partly on F, *speciosa* is relatively robust, with spreading rhizomes and sharply serrated leaves up to 2-4 cm wide at mid-stem, "more gradually and sometimes scarcely reduced above"; flowers are large (ca. 2.5-3 cm long), with few or no glands on the calyx.

HAB r-10,9? D? 5. **ABU** g9? s7? -3?

1636--*Physostegia praemorsa* Shinnery

Lamiaceae <Lamioideae>: *Physostegia praemorsa* (*virginiana** ssp. p.; v. var. *arenaria*)

Although Cantino (1982) treated this taxon as a subspecies of *virginiana*, differences are sufficient to justify species status in Ky. *P. praemorsa* occurs mostly in remnants of dry rocky grassland and glades on base-rich soils in southern states. Compared to typical *virginiana*, flowering of *praemorsa* tends to be later (mostly Jul-Sep versus Jun-Aug); racemes tend to have shorter hairs, more sterile bracts, and larger flowers (ca. 2-3.5 cm versus 1.5-2.5 cm); stems tend to be more clumped on shorter rhizomes (Cr, W), but leaves appear indistinguishable. Uncertain records mapped here (with open dots) deserve closer inspection; they may be "*speciosa*" in some cases.

HAB r-12,10 E 4. **ABU** g9 s8 -3.

1637--*Physostegia intermedia* (Nutt.) Engelm. & Gray

Lamiaceae <Lamioideae>: *Physostegia intermedia*

This is known from remnants of marshy grassland in south-central states: mostly in Ill., Mo., Okl., Ark., Tex. and La., but with outlying reports as far as Kan., Ala. and Ga. (F, PL, W). The only verified record from Ky. is a coll. of C.W. Short (PH, GH) made in "barrens of Ky." during the 1820s; it was probably made near Hopkinsville in CHRI (M). There is also a recent report from CALL (herbarium of Ind. Univ. SE).

HAB 9,2 D? 5. **ABU** g8 s1 -6?

1638--*Leonurus cardiaca* L.

Lamiaceae <Lamioideae>: *Leonurus cardiaca*

This perennial is an old medicinal herb that is widely escaped in eastern and central North America; 2n = 18.

ALI EU. **HAB** H-8,10 :: E? 4? **ABU** +5.

1639--*Leonurus sibiricus* L.

Lamiaceae <Lamioideae>: *Leonurus sibiricus*

This annual or biennial is a southern relative of *cardiaca* that is locally established in eastern states; 2n = 20. The colls. from MADI and MASO (KY) appear somewhat transitional to *cardiaca*.

ALI EU. **HAB** H-8,10 :: D? 4? **ABU** +4.

1640--*Leonurus marrubiastrum* L.

Lamiaceae <Lamioideae>: *Leonurus marrubiastrum*

This biennial is rarely established in eastern states. Some authors (W) have considered this species to form a monotypic genus, as *Chaiturus marrubiastrum* (L.) Reichenbach; $2n = 24$.

ALI EU. **HAB** H-8,10 :: E? 4? **ABU** +4.

1641--*Synandra hispidula* (Michx.) Baill.

Lamiaceae <Lamioideae>: *Synandra hispidula*

This strict biennial is largely restricted to the Ohio Rv. watershed of east-central states, where it usually occurs on the moist fertile soils of gullies, toe-slopes and terraces. Flowering populations are often small sporadic, but sometimes they are spectacular, with thousands of plants covering several acres. It is generally the only native biennial in its habitat.

HAB 5,7,4 ::? D 2. **ABU** g9 s7 -2.

1642--*Galeopsis tetrahit* L. R

Lamiaceae <Lamioideae>: *Galeopsis tetrahit*

This annual is a weed across Canada and northern states. It was mapped in Ky. by Reed (1961), but no colls. have been located (M); check Reed's materials at MO. It is likely that any plants in Ky. would be var. *bifida* (Boenn.) Lej. & Court, which has been treated as a species by some authors (W).

ALI EU.

1643--*Lamium amplexicaule* L.

Lamiaceae <Lamioideae>: *Lamium amplexicaule*

This weedy winter-annual is now widespread across temperate North America. It

may have been present in Ky. early after settlement, since Gray (1864) noted that it was "rather common" in northeastern states. But the first record from the state appears to have been in 1914 (Gm).

ALI EU. **HAB** H-10,12 ::: D 6. **ABU** +6.

1644--*Lamium dissectum* With.

Lamiaceae <Lamioideae>: *Lamium dissectum* (hybridum*; *purpureum* var. *incisum*)

This taxon is reported to be an allopolyploid ($2n = 36$) derived from *purpureum* and probably *amplexicaule* (Mennema 1989). Within North America, it is rarely established in northeastern regions.

ALI EU. **HAB** H-10 ::: E? 6? **ABU** +4.

1645--*Lamium purpureum* L.

Lamiaceae <Lamioideae>: *Lamium purpureum*

This is common across northern states and adjacent Canada, but much less frequent in warmer regions. Gray (1864) listed just New England and Penn. for its range at that time. Like *amplexicaule*, *purpureum* was not definitely recorded in Ky. until 1914, when Gm noted that it was "less common than the preceding." Both species are weedy winter-annuals in fallow fields or other disturbed ground, but *purpureum* is less tolerant of dry soils and can also occur more in woodlands.

ALI EU. **HAB** H-10,7 ::: D 4. **ABU** +6*.

1646--*Lamium maculatum* L. C

Lamiaceae <Lamioideae>: *Lamium maculatum*

This commonly cultivated perennial can persist in old gardens, and is locally escaped in northeastern states. It is well established in urban woodlands of JEFF, being locally common at Iroquois Park, and a few patches at Cherokee Park (colls. of P. Haragan for EKY).

ALI EU.

1647--*Stachys cordata* Riddell

Lamiaceae <Lamioideae>: *Stachys cordata* (riddellii, "nuttallii")

This is known mostly from mesic woodlands of the upper Ohio Rv. watershed, in Ind., Ohio, W.Va., Ky. and Va. (Nelson 2008; and pers. comm.). See notes under the closely related species, *nuttallii*.

HAB 5,7,4 C 2. **ABU** g8 s8 -2.

1648--*Stachys nuttallii* Shuttlew. ex Benth.

Lamiaceae <Lamioideae>: *Stachys nuttallii* ("eplingii")

This taxon has been confused with *cordata*, *eplingii* and *clingmanii*, but Nelson (2008; W) has recently clarified its status. It is centered in the cooler mountains of e. Tenn., but occurs also in adjacent Ky., Va., Ala., Ga., S.C. and N.C. *S. nuttallii* is closest to *cordata*, which may intergrade. It has leaf blades usually elliptic-oblong with l/w ca. 1.5-2.5 (versus ovate with l/w ca. 2.5-3), the bases rounded to slightly cordate (versus cordate), and the petioles generally shorter (ca. 1-2.5 cm versus 1.5-6 cm). Also, it has a relatively stiff stem summit (versus often flexuous or lax), and it sometimes has relatively narrow calyx-lobes or short petioles (suggesting transitions to *hispidula* or other species).

The circumscription of *S. eplingii* J. Nelson has been restricted to scattered plants of mesic to hydric sites in the central and southern Appalachians, but has not been confirmed in Ky. *S. eplingii* differs from *cordata* and *nuttalii* in its deltoid calyx lobes (versus lanceolate), more numerous flowers per vertical row (8 or more versus 6), relatively narrow leaves, and petioles only 2-5 mm. Similar plants in the Ozarks (with less glandular and more elliptic leaves) have been recently named *S. iltisii* J. Nelson (Nelson 2008).

HAB 6,9? C? 3? **ABU** g5? s4? -2?

1649--*Stachys clingmanii* Small R

Lamiaceae <Lamioideae>: *Stachys clingmanii* ("nuttalii")
This occurs mostly in the southern Blue Ridge (W, PL). There are dubious reports from JESS by McFarland (1941), and from ROCK (check MICH) by Wharton (1945), with no verified colls. Plants referable to *clingmanii* or perhaps *clingmanii-cordata* intermediates do occur in s. Ind. and s. Ill. (D, Nelson 1981, Cr).

1650--*Stachys tenuifolia* Willd.

Lamiaceae <Lamioideae>: *Stachys tenuifolia* (var. t.)
Variation in this widespread eastern species of alluvial woodlands needs further study. Some colls. from Ky. appear transitional to *hispidula*. Colls. from LYON and probably elsewhere are referable to var. *perlonga* Fern., with lanceolate leaves tapering from a truncate base. Var. *perlonga* is known from the lower Mississippi Valley and, to a lesser extent, the Atlantic Coastal Plain (Nelson 1981), but it has not been recognized in most recent treatments (e.g. J.B. Nelson in W).

HAB 4,6 D 2. **ABU** g9 s9 -3.

1651--*Stachys hispidula* Pursh

Lamiaceae <Lamioideae>: *Stachys hispidula* (*tenuifolia* var. h.)
This is a highly variable species, with transitions to *tenuifolia* and perhaps even *aspera* (C.W. Short's coll. from MEAD at MO). It seems most distinct and frequent on seasonally dried or disturbed terraces near larger streams, especially in the lower Ohio and Mississippi River valleys, but even there it is not widely recognized (e.g. Ch.). It is uncommon to rare in mid-Atlantic states (W).

HAB 9,6,10,7? D? 3. **ABU** g8 s8 -3.

1652--*Stachys aspera* Michx. T

Lamiaceae <Lamioideae>: *Stachys aspera* (*hyssopifolia* var. *ambigua*; *tenuifolia* var. *aspera*)

This may be largely restricted to the southeastern Coastal Plain and Piedmont (Sm, F, W). It has been reported from Ky. and adjacent states (Pr, K, PL, NS). But no colls. from Ky. have been found, and there has been confusion with other taxa, including *eplingii* and *hispidula*.

1653--*Stachys pilosa* Nutt. R

Lamiaceae <Lamioideae>: *Stachys pilosa* (*palustris* var. *pilosa*)
This northern and western species is reported to be adventive in southeastern states, especially on banks of shallow impoundments for waterfowl (W). It has been reported by Grubbs (1989) from HICK (recheck MUR) and by McFarland (1942) for Ky. in general, but colls. have not been located or confirmed.

1654--*Meehania cordata* (Nutt.) Britt.

Lamiaceae <Nepetoideae>: *Meehania cordata*
This monotypic genus is virtually restricted to central Appalachian regions, with a concentration in the northern Appalachian Plateaus, central Ridge & Valley, and central Blue Ridge. The only confirmed site west of Appalachian regions is in JESS (KY), on terraces of lower Jessamine Creek with beech trees on relatively acid, cherty alluvial soils. Reports from Mammoth Cave National Park were based on misidentified *Synandra hispidula* (H. Lix's coll. at US). F's report from Ill. remains dubious.

HAB 5,4 C 2. **ABU** g8 s8 -2.

1655--*Nepeta cataria* L.

Lamiaceae <Nepetoideae>: *Nepeta cataria*
This popular feline herb ("catnip") is widely naturalized in temperate regions of North America. It was not reported from Ky. until 1893 by Pr, and was omitted by Gm in 1914. It has become widely associated with disturbed base-rich soils, especially dusty ground under eaves and under cliffs, or similar habitats.

ALI EU. **HAB** h-8,10 :: E 4. **ABU** +5.

1656--*Glechoma hederacea* L.

Lamiaceae <Nepetoideae>: *Glechoma* [*Nepeta*] *hederacea*
This has been a common weed in eastern North America since early after settlement. In the central Bluegrass, Short (1828-9) noted: "abundant on the alluvion bottoms of our creeks and rivers, and in the fence-rows of rich,

cultivated fields." Variation deserves more attention; $2n = 16$ and 36 . Most or all colls. from Ky. are referable to var. *micrantha* Moric. (F), which is not generally recognized in recent treatments (Cr, W).

ALI EU. **HAB** h-7,8,10,4 :: D 3. **ABU** +6*.

1657--*Prunella vulgaris* L. var. *lanceolata* (W. Bart.) Fern.

Lamiaceae <Nepetoideae>: *Prunella vulgaris* var. *lanceolata*
Broadly defined, this is a circumboreal weedy species that is widespread across temperate regions of North America. Variation deserves more attention; $2n = 28$ and 32 . There is a large range in overall size, leaf shape and pubescence. Rafinesque (1836, 2:29-32) described 10 species in the genus from eastern states (under "Brunella"). It is sometimes erroneously implied that all *P. vulgaris* is alien in North America (e.g. SE). Most colls. from Ky. are referable to the var. *lanceolata*, which is native (F). See also notes under other varieties.

HAB F-10,7 :: D 4. **ABU** g10 s10 +2?

1658--*Prunella vulgaris* L. var. *hispida* Benth. ?

Lamiaceae <Nepetoideae>: *Prunella vulgaris* cf. var. *hispida*
These relatively hairy plants are locally abundant in Ky., especially on dry rocky sites in western regions. They may be treated as a segregate of the native var. *lanceolata* rather than true var. *hispida*, which is reportedly Asian (Cr). Further global revision is needed. Rafinesque (1836, 2:30) described two species that probably belong here: *hirsuta*, from "Illinois and Missouri"; and *cinerea*, from "Florida, Alabama, Wasoto mts. and hills of Kentucky."

HAB F-10,12 :: E? 4. **ABU** g9? s7? -1?

1659--*Prunella vulgaris* L. var. *vulgaris*

Lamiaceae <Nepetoideae>: *Prunella vulgaris* var. *vulgaris*
Some of these colls. are probably referable to the typical Eurasian variety, but the potential for intergradation with var. *lanceolata* needs to be investigated. In more northern states and Canada, this variety often occurs in lawns, being able to withstand repeated mowing. Compared to var. *lanceolata*, it has relatively small, ovate (versus lanceolate) leaves; those at mid-stem are typically ca. 2-4 cm long (versus 4-10 cm) and ca. 1-2 cm wide (versus 1.5-4 cm); l/w is ca. 1.5-2.5 (versus 2.5-3.5). However, these differences are not always clearcut.

ALI EU. **HAB** S-10 :: D? 6? **ABU** +4.

1660--*Agastache nepetoides* (L.) Kuntze

Lamiaceae <Nepetoideae>: *Agastache nepetoides*

This ranges across east-central states, usually growing in thin woods and edges on base-rich soils.

HAB 8,10,6,9? E 4. **ABU** g9 s9 -3?

1661--*Agastache scrophulariifolia* (Willd.) Kuntze

Lamiaceae <Nepetoideae>: *Agastache scrophulariifolia*
This occurs from Appalachian regions to upper midwestern states, with a similar overall range to *nepetoides* but concentrated in cooler zones. It appears to be rare in Ky., but may have been overlooked due to confusion with *nepetoides*. The coll. by D. Noe from ROCK (for EKY but still not processed) was confirmed. Other records need to be rechecked: BATH (Wharton 1945) and JACK (D. Taylor, pers. comm.).

HAB 8,10? D? 4? **ABU** g8 s4 -3?

1662--*Agastache foeniculum* (Pursh) Kuntze R

Lamiaceae <Nepetoideae>: *Agastache foeniculum*
This is native to western North America, cultivated as an ornamental, and reportedly naturalized at scattered locations in the east (W). It was reported from Ky. by Lint & Epling (1945), but no coll. has been located.

ALI W.

1663--*Monarda bradburiana* Beck

Lamiaceae <Nepetoideae>: *Monarda bradburiana* ("russeliana")
This occurs in the Ozark region and in the western Interior Low Plateaus, largely restricted to dry woods and flowering relatively early (late May-early Jun). F and Cr insisted that *M. russeliana* Nutt. is the correct name for these plants species, but there has been dissent (McClintoick & Epling 1942, Scora 1967, W). *M. russeliana* may be properly restricted to some relatively western plants within the Ozark region, which have been confused with *M. virgata* Raf. but may still warrant some distinction as a variety of *virgata* or a transition to *bradburiana*.

HAB 11,5,7 C 3. **ABU** g7 s7 -2.

1664--*Monarda* sp. nov. (aff. *russeliana* Nutt.)

Lamiaceae <Nepetoideae>: *Monarda* sp. nov. 1 ("russeliana"*, "virgata")
This species may be known only from the Knobs region of Ky., where it appears to have diverged from *clinopodia* into relatively xeric woods. The names *M. russeliana* Nutt. or *M. virgata* Raf. have been applied to it by previous authors (including F and Cr), but these name should probably be

restricted to distinct plants of Ozarkian regions with purple-spotted corollas and leaves tapering from relatively broad, abruptly truncate bases (resembling *bradburiana* but usually narrower and more petiolate). A few colls. appear to be introgressed with *clinopodia*, including some provisionally named *M. clinopodia* ssp. *praecox* R.T. Simmers (ined.) from MADI (GH, KY) and Brown Co., Ind. (GH); see also notes under *media*.

HAB 12,11,10 C 3. **ABU** g6? s6? -1.

1665--*Monarda clinopodia* L.

Lamiaceae <Nepetoideae>: *Monarda clinopodia* (*fistulosa* var. c.)

Variation within this largely Appalachian species needs further study. Based on local observations and R. Simmers (pers. comm.), some populations in regions west and south of the central Appalachians tend to have unspotted, pure white corollas (versus purple-spotted on greenish-white), calyx teeth with more large stipitate glands, leaves with shallower serration and shorter petioles. Gl noted a "stouter and more branched" western form of *clinopodia*, with "a few large, stout, stipitate glands" on calyx lobes (versus just minutely stipitate glandular in Appalachian plants).

However, possible correlations among these characters have not been fully analyzed. Leaf width varies much within all regions; colls. (EKY, KY) from BELL, BUTL, GARR and HARL have exceptionally narrow leaves (ca. 2-3 cm wide). Moreover, there has probably been introgression with other species, especially *fistulosa*. Some colls. may be hybrids with *bradburiana* (EDMO at GH) or *media* (BELL and HARL at GH); see also notes under sp. nov. 1 and sp. nov. 2.

HAB 5,7,4 C 2. **ABU** g8 s8 -2.

1666--*Monarda* sp. nov. (*clinopodia-fistulosa* intermediates)

Lamiaceae <Nepetoideae>: *Monarda* sp. nov. 2 {"*clinopodia-fistulosa* intermediates"}

These plants have been provisionally named *M. serotina* by R.T. Simmers (pers. comm). Based on initial revision (especially at GH, NCU and NY), they are most frequent west of the Appalachians (Ala., Ky., Ill., Ind., Mo., Ohio, Tenn.), but also scattered in the east (D.C., Del., Md., N.C., Pa., W.Va.). D and St treated these plants as a somewhat indistinct, broad-leaved form of *fistulosa*, generally intermediate between *fistulosa* and *clinopodia*, with probable hybrid origin.

In contrast to *fistulosa*, most colls. are from relatively mesic woods and edges on lowlands. Mid-cauline blades are usually (2) 2.5-4.5 (5.5) cm in breadth (versus 1-2 cm), widest about a third from the base (versus a quarter), relatively deep green, and on longer petioles (usually 2-3 cm versus 0.5-2 cm). Lower surfaces have scattered spreading hairs, longer (generally 1-2 mm versus <0.5 mm) and not as dense, compared to *fistulosa* var. *mollis*. Corollas are paler pink at tips to almost all white (versus more uniformly deep pink-purple), and usually less hairy; the apical beard of hairs on the upper petal (lip) is usually indistinct or absent; and the calyx orifice is usually less hairy. Flowering in Ky. and Tenn. occurs from early to mid-Jul; *fistulosa* has more varied dates, from late Jun to Aug, but with a peak in late Jul.

Compared to *clinopodia*, these plants are usually more robust and branched; leaves are generally hairier below and less bluish-green; calices tend to have less slender-stalked glands; corollas are usually pinkish, unspotted, glandular, and with relatively dense pubescence (versus white, often dark-spotted, largely glandless and glabrous).

HAB r-7,4? D? 3. **ABU** g7? s7? -3.

1667--*Monarda media* Willd. ?

Lamiaceae <Nepetoideae>: *Monarda* cf. *media* {*didyma* x *fistulosa*/other species}

This poorly understood taxon of scattered northeastern and Appalachian localities (F, Cr, K) is considered to have originated from hybrids between (a) *didyma* and (b) *fistulosa* or *clinopodia*. It has also been confused with the apparent *fistulosa-clinopodia* intermediates (see below). Introgression of *fistulosa* into *didyma* can occur within a few decades of road-building through forests (Egler 1973).

The few Ky. colls. that match typical *media* are mostly from in or near the Red River Gorge area (MENI, POWE, WOLF at KY, EKY). They could have horticultural origins, perhaps even from *didyma* planted at old home sites then hybridizing with local *fistulosa*. Some anomalous colls. (mapped here as open dots) may be *Monarda* sp. nov. 1 x *media* (MADI at GH, MENI at NY) or *clinopodia* x *media* (BELL and HARL at GH).

F combined *media* (only 3 colls. at GH) with *fistulosa* var. *rubra* Gray (only 1 coll. at GH), which has been reported from Ky. by McClintock & Epling (1942), but there is no known coll. However, var. *rubra* may be native only in the Southern Appalachians (Scora 1967, W). It has relatively narrow leaves

and more hairy flowers, compared to media, and may have resulted from introgression of didyma into fistulosa.

ALI e. **HAB** h-7,8,4? C? 3. **ABU** g5? s3? +1?

1668--*Monarda fistulosa* L. var. *fistulosa*

Lamiaceae <Nepetoideae>: *Monarda fistulosa* var. f.

This is a widespread species in eastern and central North America, with much variation; 2n = 32, 34, 36 (Cr). Further examination of colls. in Ky. is desirable for more reliable separation of varieties. Var. *fistulosa* appears concentrated in hilly regions from midwestern to Appalachian regions. Var. *mollis* is more widespread and generally more abundant, especially on base-rich soils. In Ky. the two taxa are sometimes mixed in the same locality, but appear generally distinct, with var. *fistulosa* sometimes flowering 1-2 weeks later.

Var. *fistulosa* is thinly to densely pubescent with spreading hairs on leaf surfaces (especially the lower) and on stems in the inflorescence (see also W). Var. *mollis* has shorter appressed hairs on both leaf surfaces and stems; it also tends to have larger flowering heads and narrower leaves with deeper bluish-green color and sharper flavor, yet more susceptibility to powdery mildew.

HAB R-10 C? 4. **ABU** g9? s8? -2?

1669--*Monarda fistulosa* var. *mollis* (L.) Benth.

Lamiaceae <Nepetoideae>: *Monarda fistulosa* var. *mollis*

See notes under var. *fistulosa*. Most colls. of the species from Ky. are clearly referable to var. *mollis*. There appear to be occasional hybrids with *clinopodia* or other species, and introgression may have resulted in distinct populations. However, there has been considerable confusion due to difficulties in using or understanding some published keys. The "beard" of hairs on the upper petal (lip) is often misinterpreted. In *fistulosa* these hairs are always distinct longer at the summit, at least in bud. Other species can have a thin indistinct beard that is not much longer than other hairs on the lip.

HAB R-10 D 4. **ABU** g10 s10 -2?

1670--*Monarda didyma* L.

Lamiaceae <Nepetoideae>: *Monarda didyma*

This humming bird-pollinated species is native to cooler regions east and northeast of Ky., especially at higher elevation, but it has been widely cultivated. Plants in Ky. appear to be the broad-leaved form that probably

originates from northeastern regions (Scora 1967). Most or all colls. may be persistent or escaped from plantings.

ALI e. **HAB** h-7,8,4 D? 3. **ABU** g8 s4? +1?

1671--*Monarda punctata* L.

Lamiaceae <Nepetoideae>: *Monarda* <*Cheilyctis*> *punctata*

This variable species is reportedly native to sandy soils in several regions of southwestern and eastern states, but uncommon to absent in Appalachian regions and most of the Ohio Rv. watershed (Cr, K, PL). There is only one known coll. from Ky.: MCRA, R. Athey #1445 (EKY), "sandy fields near the mouth of the Tennessee Rv." McClintock & Epling (1942) also reported ssp. *villicaulis* Pennell from Ky., but no coll. has been located.

HAB f-10? C? 4. **ABU** g10 s2 -5.

1672--*Monarda citriodora* Cerv. ex Lag.

Lamiaceae <Nepetoideae>: *Monarda* <*Cheilyctis*> *citriodora*

This southwestern annual is locally adventive in southeastern states, especially on the Coastal Plain.

ALI W. **HAB** f-10? E? 5. **ABU** +4?

1673--*Blephilia ciliata* (L.) Benth.

Lamiaceae <Nepetoideae>: *Blephilia ciliata*

This is a highly variable species across its range in east-central states, but taxonomic segregates have not been generally accepted. Some Ky. plants appear to have unusually rampant stolons with glabrous leaves, but may not be genetically distinct: e.g. those labelled "var. *repens* Simmers" from FRAN and OWEN at GH. Plants with unusually broad leaves (up to 5-6 cm wide), somewhat sharper serration, and more rounded bases, occur in relatively damp habitats of Kans., Okla., Mo., Ill. (GH) and reportedly Ky. (Cr). Rare hybrids with *hirsuta* do occur, but are not verified in Ky.

B. subnuda Simmers & Kral (1992; ?= *B. brevipes* Raf. 1836, 4:96) has been described from Ala. and probably occurs in Tenn. (Ch), but reports from Ky. and elsewhere have been erroneous. *B. subnuda* is intermediate between *ciliata* and *hirsuta* in some characters, but has calyx tubes puberulent with distinctively shorter hairs (< 0.6 mm), glabrate lower leaf surfaces, and glabrate lower stems.

HAB r-10,7,12 E 4. **ABU** g10 s9 -3.

1674--*Blephilia hirsuta* (Pursh) Benth.

Lamiaceae <Nepetoideae>: *Blephilia hirsuta*

This largely northeastern species tends to occur in deeper woods than *ciliata*, and it is absent from xeric sites. It is distinct from *ciliata* in its pale purplish to whitish flowers (versus bluish-purple), relatively short deltoid (versus linear) calyx lobes and long-acuminate (versus acute) outer bracteoles (Simmers & Kral 1992; Cr, W), Vegetative differences are somewhat inconsistent. Leaves on flowering stems tend to be more acuminate, more rounded to cordate at base, and have longer petioles; they are often eaten by invertebrates, in contrast to *ciliata*. Stems usually have longer hairs, but this is not a reliable character; rare plants have glabrous stems (as in a coll. from Sevier Co., Tenn., at GH).

HAB 7,6? D 2. **ABU** g9 s8 -3.

1675--*Salvia pitcheri* Torr. ex Benth.

Lamiaceae <Nepetoideae>: *Salvia pitcheri* (azurea var. *grandiflora**)
This occurs mostly in Ozarkian regions and along the southwestern edge of the Interior Low Plateaus (W). In Ky. it has been confused with typical *S. azurea* Michx. ex Lam., which is a more southeastern species that does not occur in the state.

HAB r-10,12 C? 4. **ABU** g8 s6 -4.

1676--*Salvia urticifolia* L.

Lamiaceae <Nepetoideae>: *Salvia urticifolia*
This southeastern species occurs only east of the Mississippi, mostly on the Piedmont, low Appalachian hills, and the southern Interior Low Plateaus, with few outliers on the Coastal Plain (K, W). Although it is known from several scattered sites in Ky., most records are historical. It persists along rights-of-way and other stable edges, spreading by very tough rhizomes. Short (1840) noted: "thin oak lands of the barrens." The only confirmed post-1970 colls. are from MCRE (Palmer-Ball et al. 1988); T. Barnes reported a large patch in this county under a powerline on Rattlesnake Ridge in 2006.

HAB 10,7 D? 4. **ABU** g7 s3 -3?

1677--*Salvia pratensis* L.

Lamiaceae <Nepetoideae>: *Salvia pratensis*
This is a rare weed in eastern states. There is only one verified Ky. coll., from a population with 100s of plants in KENT (KNK). Perhaps also belonging here is a coll. of B from KENT (check US) that she referred to *S. nemerosa* L. or the hybrid of *nemora* with *pratensis* (= *X sylvestris* L. pro sp.). *S. nemerosa*

itself is little known in eastern states. Compared to *pratensis* (Cr), its leaves are more cauline, and its flowers are smaller; $2n = 12$ or 14 , versus 18 .

ALI EU. **HAB** H-10 D? 6? **ABU** +4.

1678--*Salvia officinalis* L. C

Lamiaceae <Nepetoideae>: *Salvia officinalis*
This common cultivated herb ("garden sage") may not be truly naturalized in eastern states, but occasional colls. suggest an escaped context. The only Ky. record is a coll. of R. Athey from GRAV (check MEM).

ALI EU.

1679--*Salvia lyrata* L.

Lamiaceae <Nepetoideae>: *Salvia lyrata*
This rosette-forming, perennial, tetraploid ($2n = 36$) is a widespread southeastern species of thin disturbed woodlands, edges and old fields. It is especially common along roadsides with a moderate frequency of mowing.

HAB R-10,7 :: C 4. **ABU** g10 s10 +1?

1680--*Hedeoma hispida* Pursh

Lamiaceae <Nepetoideae>: *Hedeoma hispida*
This widely scattered North American annual is probably just adventive in some southeastern states (W). In Ky. it may be native in some rocky or sandy glades and barrens of western regions. In Appalachian regions, it known only from a few sites along roads. In addition to its narrower leaves (ca. 1-3 mm versus 4-11 mm), *hispida* has smaller seeds, with more narrowly ovoid shape and glaucous areolate surface (W), as is typical of subgenus *Saturejoides*; $2n = 34$ (versus 36).

ALI w. **HAB** R-10,12 ::: C? 6. **ABU** g10 s2 +2?

1681--*Hedeoma pulegioides* (L.) Pers.

Lamiaceae <Nepetoideae>: *Hedeoma pulegioides*
This annual is widely scattered in eastern North America, but uncommon to absent on the southeastern Coastal Plain. It is locally common in fields on medium acid soils, especially old rough-grazed pastures. This highly aromatic "American pennyroyal" generally repels consumption by insects and mammals. The "Big Barrens" on the extensive karst plain in western Ky. became known as the "Pennyrhile" region after settlement.

HAB G-10,12 ::: C? 6. **ABU** g10 s10 -2?

1682--*Melissa officinalis* L.

Lamiaceae <Nepetoideae>: *Melissa officinalis*

This "balm" from western Asia is widely cultivated and locally persistent or escaped in eastern states.

ALI EU. **HAB** H-10 ::? D? 6? **ABU** +4.

1683--*Conradina verticillata* Jennison

Lamiaceae <Nepetoideae>: *Conradina verticillata* (montana)

This decumbent shrub (subshrub) is known only from open boulder-cobble bars of the Cumberland Plateau: along the Big South Fork of Cumberland Rv. in Ky. and Tenn.; along the Obed and Emory Rv. in Tenn. [Another globally rare species in this habitat is *Marshallia grandiflora*.] The five other species of *Conradina* occur only in scrubby vegetation on sandhills in s. Miss., s. Ala. and Fla. (Sm, W).

HAB 1 + B 5. **ABU** g5 s3 =.

1684--*Clinopodium glabellum* (Michx.) Kuntze

Lamiaceae <Nepetoideae>: *Clinopodium* <Calamintha> [*Satureja*] *glabellum* (?var. g.)

Typical *glabellum* may be restricted to three disjunct areas, in the Bluegrass of Ky., Central Basin of Tenn. and a few glades in Ala. (K). Records from the Ozarks of Mo. and Ark. remain dubious (W and citations). It usually grows on calcareous soils in thin woods and edges of cedar glades, often disturbed by various factors, including stream scouring and dirt roads. The distribution of *glabellum* in Ky. suggests an association with bison trails or other megafauna before settlement. It appears to have been uncommon even in Short's time, when he knew it as *Cunila glabella*: "only on the borders of a rivulet emptying into Elkhorn, at the Forks near Frankfort, Ky." (Short & Peter 1834).

C. glabellum, in its strict sense, has been confused in some literature with the closely related *C. arkansanum* (Nutt.) House (= *Hedeoma glabra* Nutt., *Satureja glabella* (Michx.) Briq. var. *angustifolia* (Torr.) Svenson). The latter is reportedly more widespread across east-central states but most common in the Ozarks. It is not verified in Ky., but a coll. from GARR (EKY), made by W. Overbeck in 2011 does appear at least transitional to *arkansanum*.

HAB r-12,10,7 +:: E 4? **ABU** g6 s5 -3.

1685--*Clinopodium calamintha* (L.) Stace

Lamiaceae <Nepetoideae>: *Clinopodium* <Calamintha> [*Satureja*] *calamintha* (Ca. *nepeta*)

This alien is locally well-established in some eastern states, but it remains virtually unknown in the Ohio Valley and midwest (PLs). The two Ky. colls. date from ca. 1930-1950 (B, M). Within *Calamintha*, these plants have been referred to typical ssp. *nepeta*, as opposed to ssp. *glandulosa* (Riquien) P.W. Ball. However, this segregation may not be reasonable (M, W).

ALI EU. **HAB** R-10,12 :: C? 6? **ABU** +5.

1686--*Clinopodium vulgare* L. var. *neogaea* (Fern.) C.F. Reed

Lamiaceae <Nepetoideae>: *Clinopodium* [*Satureja*] *vulgare*

This is widely scattered in eastern North America, except on most of the southeastern Coastal Plain. Rafinesque (1936, 1:31) expressed uncertainty about its naturalized versus native status. In Ky. most or all plants are referable to *C. vulgare* var. *neogaea* (Fern.) C.F. Reed, which is generally considered native to North America. F distinguished these plants from Eurasian ones (var. *vulgare*) as follows: flowers lilac-pink to white (versus purple-red); leaves larger (?), glabrous or only sparsely strigose on upper surfaces (versus copiously strigose-villous); and more upright habit (?).

HAB F-10,12 :: C 4. **ABU** g9 s8 -1?

1687--*Clinopodium acinos* (L.) Kuntze R

Lamiaceae <Nepetoideae>: *Clinopodium* <Acinos> [*Satureja*] *acinos* (A. arvensis)

This alien annual is scattered though northeastern and some northwestern states (PL). It was reported from Ky. by Heineke (1987), apparently based on a coll. of R. Athey from MARS (or CALL; check EKY).

ALI EU.

1688--*Pycnanthemum albescens* Torr. & Gray R

Lamiaceae <Nepetoideae>: *Pycnanthemum albescens*

This diploid (2n = 38) of the Ozarks and Gulf Coastal Plain has been confused with the *incanum* group in Ky. and elsewhere. The diagnostic character of *albescens* is that its calyx teeth and subtending bracts lack apical bristles (Cr); also heads and leaves tend to be relatively small. It is widespread on uplands in s. Mo., where the *incanum* group is absent (St), and it is known from s. Ill., where their ranges abut. It has been reported from CALL (M), HICK (Grubbs 1989) and perhaps elsewhere in Ky. (St, Cr), but no verified colls. from Ky. or Tenn. (Ch) have been located. The report from LEWI (B) was based on misidentified *pycnanthemoides*. There is an old verified coll. at GH ("ex herb. George Thurber"), with "Kentucky" written on the label; this might be a coll.

of C.W. Short from within the state, or it might have been sent to him from elsewhere.

1689--*Pycnanthemum loomisii* Nutt.

Lamiaceae <Nepetoideae>: *Pycnanthemum loomisii* (incanum var. l.)
Mapping here is provisional; further review of the loomisii-incanum-pycnanthemoides group is needed. In calyx and pubescence patterns, loomisii appears somewhat intermediate between incanum and pycnanthemoides, but Chambers (1993) and others have shown that it is a distinct diploid ($2n = 38$) species with a southeastern range east of the Mississippi Rv. Yet the best diagnostic character remains troublesome: compared to pycnanthemoides, loomisii has smaller seeds with a smoother surface (F, Cr, W).

HAB f-7,8,10 B? 4. **ABU** g8? s8? -2.

1690--*Pycnanthemum pycnanthemoides* (Leavenworth) Fern.

Lamiaceae <Nepetoideae>: *Pycnanthemum pycnanthemoides* {suggested: incanum var. p.}

After 30 years of work in the field and herbarium, B concluded that no reliable separation of pycnanthemoides, loomisii and incanum is possible, and subsequent botanists in Ky. have generally shared this view. However, Chambers (1993) and others have insisted that pycnanthemoides is a distinct tetraploid species ($2n = 72$), with a largely Appalachian range but also extending to s. Ill., w. Ky. and perhaps n. Ala. See also notes under incanum

HAB f-7,8,10 B 4. **ABU** g9 s9 -2.

1691--*Pycnanthemum incanum* (L.) Michx.

Lamiaceae <Nepetoideae>: *Pycnanthemum incanum* (var. i.)

Mapping here is provisional; several records should probably be transferred to loomisii, and separation from pycnanthemoides is also difficult. *P. incanum* is considered by some authors (W) to be a distinct tetraploid species ($2n = 76$) in the Ohio Valley and Appalachian regions. *P. incanum* reportedly differs from the other two species in its calyx lobes, which are deltoid (versus acuminate) and relatively short, the lower ones 1-1.5 mm (versus 1-3 mm) and less than half as long as the tube (versus usually more than half). Superficially, the name "incanum" is often applied in Ky. to plants with relatively small yellowish green leaves (versus deeper bluish-green), less open branching, smaller cymes, and generally less spreading pubescence. Such plants may be typical of relatively dry and open sites.

HAB f-10,8,7? B? 4. **ABU** g8? s8? -2.

1692--*Pycnanthemum muticum* (Michx.) Pers.

Lamiaceae <Nepetoideae>: *Pycnanthemum muticum*
Mapping here is tentative. This variable species ($2n = 40, 80$, ca. 108) is reportedly widespread in southeastern and Atlantic states but uncommon to absent in the Ohio Valley and upper midwest (Cr, K, W). It has been rarely reported in Ky., and all colls. should be rechecked.

The closely related southern Appalachian diploid ($2n = 38, 40$), *P. montanum* Michx., was reported from c. Ky. by Linney (1882), but that record might have been based on muticum. Compared to the incanum group, both montanum and muticum have more densely capitate inflorescences (without evident branches), and calyx lobes that are relatively short (0.5-1.5 mm), more or less equal, lacking distinct apical tufts of long jointed hairs. *P. muticum* itself also has distinctively short (0-3 mm) petioles. It appears somewhat intermediate between the incanum group and the pilosum group.

HAB f-9? C? 5. **ABU** g9 s4 -5.

1693--*Pycnanthemum pilosum* Nutt.

Lamiaceae <Nepetoideae>: *Pycnanthemum pilosum* (verticillatum var. p.)
In Ky. this largely midwestern species is a moderately conservative remnant of dry native grasslands, mostly in western regions. It is unknown in Appalachian regions, but plants were recently discovered on dolomitic foothills of the Knobs region: on the Blue Grass Army Depot in MADI (JC for KY).

HAB f-10,7,12 C 5. **ABU** g9 s8 -4.

1694--*Pycnanthemum verticillatum* (Michx.) Pers.

Lamiaceae <Nepetoideae>: *Pycnanthemum verticillatum* (var. v.)
In Ky. this northeastern species is rare, found mostly on seasonally wet acid soils in Appalachian regions. There has been confusion with typical pilosum, which is a largely midwestern species that mostly occurs on drier ground. *P. verticillatum* deserves distinction as a species (F, Gl) or a variety (Cr, W). It lacks the general hairiness of typical pilosum (except upper surfaces of bracts and leaves); however, both taxa may be tetraploids ($2n = 76$ or 78).

HAB f-9,10 B 4. **ABU** g8 s4 -5.

1695--*Pycnanthemum torreyi* Benth.

Lamiaceae <Nepetoideae>: *Pycnanthemum torreyi*

This has a relatively small range from mid-Atlantic states to the central Mississippi Valley, and it is poorly known in some regions (K, PL). In Ky. it

is largely restricted to remnants of dry native grassland of the Big Barrens region or nearby. *P. torreyi* reportedly includes varied polyploids ($2n = 78, 80$ and 120 ; Chambers 1993). Superficially, it appears intermediate between *verticillatum* and *tenuifolium*. See also notes under *virginianum*. The spelling "torrei" can be considered an orthographic variant (W).

HAB 10,12 D? 5. **ABU** g7 s4 -5.

1696--*Pycnanthemum virginianum* (L.) T. Dur. & B.D. Jackson ex B.L. Robins. & Fern.

Lamiaceae <Nepetoideae>: *Pycnanthemum virginianum*
This tetraploid ($2n = 80$) has with a fairly wide northeastern range, but it is largely restricted to seasonally wet sites on base-rich soils. It is rare or absent in most of the unglaciated Ohio Rv. watershed (K, PL). In Ky. it is verified only from a few sites in western regions. There has been some confusion with *torreyi*, which mostly occurs further east within the state; colls. originally identified as *virginianum* from CALL, HARD and LIVI have been transferred to *torreyi*, and others should be rechecked.

HAB 9,10 D? 5. **ABU** g9 s4 -5.

1697--*Pycnanthemum tenuifolium* Schrad.

Lamiaceae <Nepetoideae>: *Pycnanthemum tenuifolium* ("flexuosum")
This is widespread across eastern states in grassland on dry or damp soils. It varies much in chemistry, leaf width and other characters. Although *tenuifolium* is generally glabrous, a few colls. from Ky. have hairy stems. Both diploids ($2n = 40$) and tetraploids ($2n = 80$) are known across its range (W). However, segregates have not generally been recognized, and hybridization with other species is not documented. There has been nomenclatural confusion with *P. flexuosum* (Walt.) B.S.P., which occurs in southeastern states, mostly on the Coastal Plain (W).

HAB F-10,9,12 C 5. **ABU** g10 s9 -3.

1698--*Cunila origanoides* (L.) Britt.

Lamiaceae <Nepetoideae>: *Cunila origanoides* (*mariana*)
This occurs in dry woods on acid soils of east-central states, from Appalachian to Ozarkian regions. It is a powerful mint ("dittany") that can cause allergic reactions in a few people, as discovered by JC after recommending a chew to a field-trip participant.

HAB 11,7,10 B 3. **ABU** g9 s9 -2.

1699--*Lycopus virginicus* L.

Lamiaceae <Nepetoideae>: *Lycopus virginicus* (var. v.)

This is a widespread southeastern species in swampy woods and marshy places.

HAB 9,6,2 C 3. **ABU** g10 s10 -3.

1700--*Lycopus uniflorus* Michx.

Lamiaceae <Nepetoideae>: *Lycopus uniflorus* (*virginicus* var. *pauciflorus*)
This widespread northern species can be confused with typical *virginicus* without flowers or fruits, through it is distinctly tuberous. Extensive hybridization is known where ranges overlap (Henderson 1962; Cr). For Ky. the only definite record is a coll. of B from ROWA (US). There is also a somewhat immature coll. from KENT (KNK) that may be *uniflorus* (BT), and an apparent hybrid with *virginicus* from EDMO (US).

HAB 9,6,2? C? 3? **ABU** g10 s1? -5?

1701--*Lycopus rubellus* Moench

Lamiaceae <Nepetoideae>: *Lycopus rubellus*
This occurs widely in eastern states, but it is most frequent along the Coastal Plains, and absent in the upper midwest. It typically occurs in deeper wooded swamps, often growing on tree bases and stumps above the waterline.

HAB 3,2,9 D? 3. **ABU** g9 s8 -2.

1702--*Lycopus americanus* Muhl. ex W. Bart.

Lamiaceae <Nepetoideae>: *Lycopus americanus*
This is widespread across temperate regions of North America, usually growing in marshy areas on base-rich soils. The few reports from Ky. of the closely related alien, *L. europaeus* L., were probably based on *americanus* (M). *L. europaeus* is naturalized in more northeastern regions, and reportedly hybridizes with *americanus* (Cr); $2n = 22$ in both.

HAB f-9,6,1 D 4. **ABU** g10 s9 -3.

1703--*Mentha canadensis* L.

Lamiaceae <Nepetoideae>: *Mentha canadensis* (*arvensis* var. *c.**, *villosa*)
This northern species occurs in North America and East Asia. It is considered to be a "relict amphidiploid [$2n=96$] of the mixed mesophytic flora of the Lower Tertiary" that probably originated from hybridization of *longifolia* [$2n=24$] and *arvensis* [$2n=72$] (Tucker & Chambers 2002). Most or all colls. from Ky. are referable to var. *glabrata* Benth., but that taxon has not been generally recognized in recent treatments. Typical *arvensis*, a European taxon,

may be naturalized in some northeastern regions, but reports from Ky. are probably based on canadensis (M).

HAB f-9,2,1 ::? E 4. **ABU** g10 s6 -4.

1704--Mentha X gracilis Sole

Lamiaceae <Nepetoideae>: *Mentha X gracilis* (arvensis x spicata; cardiaca, "gentilis")

This sterile clone is a European cultigen that has locally persisted or escaped. It is a hybrid of arvensis (2n = 72) and spicata (2n = 48) with intermediate chromosome number (2n = 60); other hybrids of these species have different chromosome numbers (from 54 to 120). See Tucker & Fairbrothers (1990) for analysis of its hybrid origin. The epithet "gentilis" has been applied to these plants, but *M. gentilis* L. is a synonym of the northern and eastern European *M. arvensis* ssp. *parietariaefolia* (Becker) Briq. (Tucker & Nazci, in prep.).

ALI EU. **HAB** H-9,2,1 ::? E? 5. **ABU** +4.

1705--Mentha longifolia auct. non (L.) Huds. T

Lamiaceae <Nepetoideae>: *Mentha* "longifolia" {spicata x longifolia, or pubescent spicata}

Although the name longifolia has been applied to plants known as "horse-mint" in North America, almost all of these plants are now considered by Tucker & Naczi (2007) to be a pubescent variant of spicata or the hybrid between spicata and longifolia (= X villosa-nervata Opiz, sometimes called "American Spearmint"). There may also be confusion with the hybrid of lanceolata and suaveolens (= X rotundifolia). In Ky. there are only old or obscure records of longifolia, from FAYE, JESS, KENT and MEAD during ca. 1930-1950 (M), and these all need to be checked.

True longifolia is a diploid (2n = 24) that is close to the tetraploid species, spicata (2n = 48). Based on Tucker & Naczi (2007), it can be distinguished by its hairs all uniseriate (versus occasionally dendroid on abaxial leaf surface), its leaves widest near the middle (versus near base), and its fertile anthers 0.28-0.38 mm long (versus 0.38-0.52 mm).

ALI EU. **HAB** H-9? ::? E? 5. **ABU** +4.

1706--Mentha X rotundifolia (L.) Huds. (pro sp.)

Lamiaceae <Nepetoideae>: *Mentha X rotundifolia* (longifolia x suaveolens)
This cultivar is occasionally escaped in eastern states. It is a fertile diploid (2n = 24) hybrid of suaveolens and longifolia, and it can be confused with the

mostly sterile triploid (2n = 36) hybrid of suaveolens and spicata (= X villosa), which is not known to be naturalized in the state.

ALI EU. **HAB** H-9? ::? E? 5. **ABU** +4.

1707--Mentha suaveolens Ehrh.

Lamiaceae <Nepetoideae>: *Mentha suaveolens* ("rotundifolia")

This widely cultivated diploid species (2n = 24) is commonly cultivated as "apple mint:" and locally persistent or escaped in southeastern states. It has been confused with the diploid hybrid between suaveolens and longifolia (= X rotundifolia); see also notes under longifolia.

ALI EU. **HAB** H-9? ::? C? 5. **ABU** +4.

1708--Mentha spicata L.

Lamiaceae <Nepetoideae>: *Mentha spicata*

This widely cultivated "spearmint" has sessile leaves and narrow spikes. It is an ancient hybrid of longifolia and suaveolens (2n = 48); see review of Tucker & Naczi (2007).

ALI EU. **HAB** F-9 ::? E 5. **ABU** +6.

1709--Mentha X piperita L. (pro sp.)

Lamiaceae <Nepetoideae>: *Mentha X piperita* (aquatica x spicata)

This is "peppermint"--the most widely naturalized plant in the genus. Menthol content is higher in this hybrid (2n = 72, 84, 108) than in either of its parents: aquatica (2n = 96) and spicata (2n = 48). Plants are reportedly sterile, but some fertility may be expected in *Mentha* hybrids (Tucker & Naczi 2007). Occasional plants are more hairy, and can appear spontaneously due to somatic mutation.

ALI EU. **HAB** F-9,1 ::? D 5. **ABU** +6.

1710--Mentha X citrata Ehrh. (pro. sp.) C

Lamiaceae <Nepetoideae>: *Mentha X citrata* (aquatica var. c.; X piperita var. c.)

There are records of this cultivated "lemon mint" from FLEM (B) and perhaps BOYL (S. Studlar, pers. comm.), but not clearly naturalized. Although citrata has often been considered of hybrid origin from aquatica and spicata, its treatment remains somewhat controversial. Stace (1997) treated X citrata as a variety of X piperita; Kartesz (1999) and others have included it under aquatica; Tucker & Naczi (2007) and W have treated it as a variety of aquatica. Tucker and Naczi noted that most plants appear to be male sterile

forms of *aquatica* (which has globose to ovoid heads), and may be named var. *citrata* (Ehrh.) Fresen., but these can cross with some forms of *X piperita*.

ALI EU.

1711--*Collinsonia canadensis* L.

Lamiaceae <Nepetoideae>: *Collinsonia canadensis*

This is widespread in temperate regions east of the Mississippi, usually in mesic woods on moderately fertile soils. Although widely scattered within suitable habitat, the species is rarely abundant. An unusually dense population was noted recently near the mouth of Howards Cr. in CLAR. The plant became famous in the 19th Century for various medicinal uses, and there has been some recent revived interest in its unusual chemistry. Roots and leaves have a peculiar bitter lemony flavor.

HAB 5,7 D 2. **ABU** g9 s9 -1.

1712--*Collinsonia verticillata* Baldw.

Lamiaceae <Nepetoideae>: *Collinsonia* <Mitcheliella> *verticillata*

This has a somewhat fragmented range, centered on the southern Appalachians but with disjunct populations in some adjacent regions. In Ky. there is a confirmed coll. from WHIT (KY) by E. Hartowicz, and a reported coll. from PIKE (check NCU) by F. Levy (BA). *C. verticillata* differs sufficiently from other *Collinsonia* species to be placed in its own subgenus (Peirson et al. 2006). It flowers earlier than *canadensis* (Apr-Jun versus Jul-Sep) and it can extend into drier woods (W).

HAB 5,11 D? 2. **ABU** g6 s2 -3?

1713--*Perilla frutescens* (L.) Britt.

Lamiaceae <Nepetoideae>: *Perilla frutescens*

This South Asian species is a widespread weed in partial shade on moist soil, especially where exposed to grazing pressure. It is a strongly aromatic herb that has much traditional culinary use, but there can also be adverse reactions in mammals (Cr; Kerr et al. 1986). Most colls. appear to be the typical variety (F, W). There is also an unconfirmed record (Davies 1955) of var. *crispa* (Benth.) Dean, which has leaves more deeply purple, somewhat lacinate and crisped.

ALI AS. **HAB** g-10,7 ::: C 3. **ABU** +6.

1714--*Mosla dianthera* (Buch.-Ham. ex Roxb.) Maxim.

Lamiaceae <Nepetoideae>: *Mosla* [*Orthodon*] *dianthera*

The first North American records of this East Asian species were from southeastern Ky. in the 1940s (Rogers 1942; F). It was not collected by B during her extensive field of the 1930s. *M. dianthera* has now spread through several sections of the southern Appalachian regions and adjacent hills, especially on or near the Cumberland Plateau in Ky., Tenn. and nw. Ga. (K, PL, SE). It mostly occurs along trails in dry woods on strongly acid soils. The plant is well known for culinary and medicinal uses in East Asia, with chemistry somewhat similar to the related genus, *Perilla*.

ALI AS. **HAB** r-8,10,12 ::: B 3. **ABU** +5*.

1715--*Hydrolea ovata* Nutt. ex Choisy

Hydroleaceae [*Hydrophyllaceae**]: *Hydrolea ovata*

This spiny rhizomatous perennial is largely restricted to thin swampy woods and marshy openings of the lower Mississippi Valley and Gulf Coastal Plain (Sm, W). It is rare within the northern section of its range here in Ky.

HAB 9,2 C? 4. **ABU** g6? s3 -5.

1716--*Hydrolea quadrivalvis* Walt. R

Hydroleaceae [*Hydrophyllaceae**]: *Hydrolea quadrivalvis*

This occurs mostly on the southeastern Coastal Plain to the east of uniflora. *H. quadrivalvis* was reported in early KSNPC databases from GRAV or HICK, but probably in error (M); a coll. may be mislaid. It has also been reported from w. Tenn. (Ch).

1717--*Hydrolea uniflora* Raf.

Hydroleaceae [*Hydrophyllaceae**]: *Hydrolea uniflora*

This is largely restricted to marshy openings on the lower Mississippi Alluvial Plain.

It has been confused with *H. quadrivalvis*. Also, hybrids of *uniflora* and *ovata* have been reported from some states (Cr), which might be difficult to distinguish from *quadrivalvis*; $2n = 20$ in all three species.

HAB 2,9? C? 4. **ABU** g8? s5 -4.

1718--*Nicandra physalodes* (L.) Gaertn.

Solanaceae: *Nicandra physalodes*

This monotypic genus is a widespread weedy species in eastern states, but usually infrequent. It is occasionally cultivated for ornament, but records mapped here are generally from roadsides or similar sites.

ALI SA. **HAB** H-10 ::? D 6. **ABU** +4.

1719--*Physalis pubescens* L.

Solanaceae: *Physalis pubescens* (barbadensis, "pruinosa")
This pantropical annual has been confused in Ky. with *P. grisea* ("pruinosa"), *P. cordata* Mill. (= *pubescens* var. *glabra*) and *P. heterophylla* var. *ambigua*. Most or all material may be referable to var. *integrifolia* (Dunal) Waterfall, which extends into cooler zones than typical *pubescens*. However, further revision of colls. from Ky. is needed. Short (1833) reported *P. obscura* Michx., a old synonym of *P. cordata* P. Mill. (= *P. pubescens* var. *glabra* (Michx.) Waterfall), which is a southern relative of *pubescens* that is unknown in most eastern states (Cr, W).

ALI s. HAB H-10 ::? D? 6. ABU g10 s8? -1?

1720--*Physalis grisea* (Waterfall) M. Martinez

Solanaceae: *Physalis grisea* ("pruinosa"*; *pubescens* var. *grisea*)
This annual is reported mostly from northeastern states (Cr), but it may be much more widely distributed. It has often been confused in appearance with *pubescens* and *heterophylla*; colls. generally need to be rechecked. The name *P. pruinosa* L. has been applied to *grisea* in error; true *pruinosa* occurs in Mexico and Central America (as reviewed by W).

HAB H-10 ::? C? 6. ABU g9 s6? -3?

1721--*Physalis philadelphica* Lam. R

Solanaceae: *Physalis philadelphica* ("ixocarpa")
This Mexican annual ("tomatillo") is cultivated for its fruit, and occasional escapes have been recorded across North America. In Ky. there are a few old reports, and some more recent colls. from FAYE (KY), HICK and LIVI (R. Athey; check EKY). Identification and status of these records remains somewhat uncertain. *P. philadelphica* is closely related to *angulata* (F, Cr, W), but has larger flowers, often with purple maculations; $2n = 24$ (versus 24 and 48 in *angulata*). Some of the Ky. colls. are probably referable to var. *immaculata* Waterfall (= *P. ixocarpa* auct. non Brot. ex Herman).

ALI S.

1722--*Physalis angulata* L.

Solanaceae: *Physalis angulata*
This is a widespread weed in warmer regions of the Americas. In Ky. it has been casually confused with *subglabrata*, but differs in its annual (versus rhizomatous) habit; its more coarsely dentate largest leaves (versus sinuate-dentate); and its smaller fresh flowers (ca. 4-10 x 6-15 mm versus 11-17 x 15-25 mm), which lack purple maculations. Some colls. may be referable to the

rather poorly defined, southern or western var. *pendula* (Rydb.) Waterfall, but this is not confirmed. BA reported the closely related Ozarkian *P. missouriensis* Mack. & Bush, but no colls. have been verified.

HAB H-10 ::? C? 6. ABU g9 s8? +1?

1723--*Physalis subglabrata* Mackenzie & Bush

Solanaceae: *Physalis subglabrata* (*longifolia* var. s.*)
This weedy perennial is widespread across eastern states, especially in old pastures and hayfields. There has been some superficial confusion with *angulata*; see also notes under the more closely related *longifolia* (sensu stricto) and *virginiana*.

HAB G-10 E? 5. ABU g10 s10 +1?

1724--*Physalis longifolia* Nutt. R

Solanaceae: *Physalis longifolia* (var. l.; *virginiana* var. *sonorae*)
This western perennial species, in its strict sense, may be unknown in the Ohio Valley (Sullivan 2004; Ch). It has been reported by Grubbs (1989) and others (M), but no coll. has been confirmed. The more eastern *subglabrata* has often been combined as a variety, but differences in morphology and range seem significant (F).

1725--*Physalis virginiana* P. Mill.

Solanaceae: *Physalis virginiana* (var. v.)
This widespread eastern perennial is often confused with *subglabrata*, which occurs on damper sites. However, pubescence patterns are distinct (F, W), and *virginiana* usually flowers earlier (in Jun-Jul versus Jul-Aug). *P. virginiana* was apparently named *P. pensylvanica* L. in early literature from Ky. (M).

HAB g-12,10 C 5. ABU g10 s8 -2?

1726--*Physalis hispida* (Waterfall) Cronq. R

Solanaceae: *Physalis hispida* ("lanceolata", *pumila* ssp. h.)
This widely scattered midwestern perennial is known in s Ill. (PL) and expected in Ky. It was reported by BA but no coll. has been located.

1727--*Physalis peruviana* L.

Solanaceae: *Physalis peruviana*
This widely cultivated species ("Cape-gooseberry") rarely persists as an escape in North America. It is known from an extensive naturalized population in NELS (MM #13659-85 for WKY), and it was reported by Huffaker (1975) from CART.

ALI SA. HAB G-10? D? 6? ABU +4?

1728--*Physalis heterophylla* Nees var. *heterophylla*

Solanaceae: *Physalis heterophylla* var. h.

This perennial is widespread in eastern and central North America. Variation needs further assessment; see notes under var. *ambigua*. Also, hybrids with *virginiana* may be expected (Sullivan 2004); note that $2n = 24$ in virtually all *Physalis* species of eastern North America (Cr). In some early literature from Ky. (M), *heterophylla* was apparently referred to as *P. viscosa* L., a name that probably should not apply to any *Physalis* in eastern North America (W).

HAB G-10 E? 5. ABU g10 s9 +1?

1729--*Physalis heterophylla* Nees var. *ambigua* (Gray) Rydb.

Solanaceae: *Physalis heterophylla* var. *ambigua* (nyctaginea)

This has a pubescence pattern that is distinct from typical *heterophylla*: sparse long jointed hairs (1-2 mm), versus dense viscid short hairs (up to ca. 0.5 mm). However, it is not recognized in some recent treatments (Cr, W). It is not clear if there are significant differences in range or habitat. Var. *ambigua* has often been confused with *pubescens*.

HAB G-10 D? 5. ABU g9 s8? +1?

1730--*Physalis alkekengi* L. C

Solanaceae: *Physalis alkekengi*

This northeast Asian perennial is commonly cultivated in eastern states, and occasionally escapes. In Ky. it has been recorded from old home sites and gardens, but it does not seem to be truly naturalized (M).

ALI AS.

1731--*Solanum dulcamara* L.

Solanaceae: *Solanum dulcamara*

This shrubby scrambler is a common weed in more northeastern regions. In Ky. it is generally rare and limited to northern counties. It was reported as early as 1893 (Pr) and 1914 (Gm). No varieties are recognized, but the species contains a polyploid series; $2n = 24$ (as in many Solanaceae), 48 and 72.

ALI EU. HAB R-8 D 4. ABU +4.

1732--*Solanum ptychanthum* Dunal

Solanaceae: *Solanum ptychanthum* ("americanum"; *nigrum* var. *virginicum*)

This North American annual is an remarkably widespread, variable weed; flowering plants in Ky. range from 3 cm to 1 m or more tall. It is a native

diploid ($2n = 24$) that is closely related to the Eurasian species, *S. nigrum* L. ($2n = 72$). These taxa have often been combined or confused in nomenclature; see keys and citations of Cr and W. Probably all previous reports of *nigrum* from Ky. should be transferred to *ptychanthum*. *S. americanum* Miller is a more southern relative on the Coastal Plain. A cultivar in this complex known as "Burbank's Wonderberry" was widely distributed a century ago or more, about which Gm stated: "The berries are edible, if one desires to think so."

HAB H-10,8,7 :: D 4. ABU g10 s10 +1?

1733--*Solanum saccharoides* Sendtn.

Solanaceae: *Solanum sarrachoides* ("physalifolium"*)

This weedy annual is originally from South America but has been confused in some accounts with *S. physalifolium* Rusby, which occurs mostly in western North America (Cr, W). There are different interpretations, and both taxa may be present in southern states.

ALI SA. HAB G-10 :: D? 6. ABU +4.

1734--*Solanum carolinense* L.

Solanaceae: *Solanum carolinense*

This prickly perennial weed is said to have originated in southeastern states, but has now spread widely across eastern and central North America (Cr). It is especially common in old pastures.

HAB G-10 :: D 5. ABU g10 s10 +2?

1735--*Solanum elaeagnifolium* Cav.

Solanaceae: *Solanum elaeagnifolium*

This was originally centered in the southern Great Plains, but it is adventive at scattered sites across southeastern states (Cr, W). The only records from Ky. are due to Mohlenbrock et al. (1966). It differs from *caroliniense* in its narrower leaves (ca. 1-3 cm versus 2-8 cm, and l/w ca. 3-6 versus 2), which are entire to sinuate (versus irregularly lobed or cleft) and silvery-canescens (versus loosely hairy), with stellate hairs ca. 0.5 mm wide and at least 12 rayed (versus 1-2 mm and ca. 5-rayed); stems are sparsely spiny to spineless (versus consistently spiny); $2n = 24$ and 72 (versus just 24).

ALI W. HAB G-10 :: D? 5. ABU +4.

1736--*Solanum rostratum* Dunal

Solanaceae: *Solanum rostratum* ("cornutum")

This western annual is a locally adventive in eastern states. In Ky. it first appeared during 1893-1902 (Pr, Gm), when it became locally common in the

central Bluegrass. Gm noted that it was probably introduced with alfalfa hay and seed. After 1950, there have been few records, suggesting a decline.

ALI W. **HAB** G-10 :: D 6. **ABU** +4<

1737--Solanum lycopersicum L. C

Solanaceae: Solanum <Lycopersicon> lycopersicum (L. esculentum)

This sprawling annual (the tomato) is much cultivated, especially in warmer regions. In Ky. there are occasional escapes, but the species is not truly naturalized. Many cultivars are known (2n = 24 and 48), and the "cherry tomato" is often treated as var. cerasiforme (Dunal) Spooner, J. Anderson & R.K. Jansen (= L. esculentum Miller var. leptophyllum (Dunal) D'Arcy). That variety tends to reseed itself rather frequently within gardens, but still does not spread significantly away from gardens. Note that replacement of the "tomato" genus (Lycopersicum) into the "potato" genus (Solanum) is an excellent example of objective cladistic thought (versus sentimental attachment to distinctive fruit)!

ALI SA.

1738--Lycium barbarum L.

Solanaceae: Lycium barbarum (halimifolium)

This scrambling shrub from southern Europe has been widely planted in gardens across eastern states, and occasionally escaped. Although cultivated in Ky. for over a century (Pr) and somewhat persistent, this ornamental ("matrimony vine") has not become well-established. Gm noted: "frequently observed about old premises. Sometimes escaping and growing in out-of-the-way places."

ALI EU. **HAB** H-10 :: D? 6. **ABU** +4.

1739--Lycium chinense Mill.

Solanaceae: Lycium chinense ("barbarum")

This Chinese species is often confused with barbarum, as reflected in nomenclatural history, and some authors have combined the two species (Cr, J). The only verified records from Ky. are coll. from JEFF (MM # 18084-87 at WKY) and MEAD (herbarium of Ind. Univ. SE). L. chinense has corolla lobes longer than the tubes (versus shorter); its leaves are bright green (versus gray green) and relatively short (ca. 2-5 cm versus 3-8 cm).

ALI EU. **HAB** H-10 :: D? 6. **ABU** +4.

1740--Datura stramonium L.

Solanaceae: Datura stramonium

This is a cosmopolitan weed of warmer regions, perhaps originating from Central America (Cr, W). It is locally abundant in old barnyards and similar eutrophic places with much influence of livestock. The status of stramonium in North America remains somewhat uncertain, but it is often considered to have been introduced with the early settlements in Va. Based on early records, it appears to have become abundant in Ky. within 10-15 years after settlement during the 1770s. Most or all plants in Ky. are referable to var. tatula (L.) Torr., but that taxon may not be worth recognizing.

ALI s. **HAB** G-10 :: D 6. **ABU** g10 s9? +5.

1741--Datura innoxia P. Mill. C

Solanaceae: Datura innoxia ("meteloides")

This Mexican species has been confused with D. wrightii Regel. Both taxa may be scattered in southeastern states, or they may not be distinct enough to separate (W). There are colls. from FAYE (KY), PIKE (M) and perhaps elsewhere in Ky., but these may only be from rare garden escapes.

ALI S.

1742--Nicotiana tabacum L. C

Solanaceae: Nicotiana tabacum

This common "tobacco" is a tetraploid (2n = 48) from warmer regions of the Americas that became widely cultivated in southeastern states after settlement from Europe. n Ky. it has occasionally been collected for herbaria, but it is not truly naturalized. N. rustica L. ("Aztec Tobacco") was reported by Webb & Funkhauser (1936) from excavations of native american sites in MENI; that species originated in Peru.

ALI SA.

1743--Petunia X hybrida Vilm. C

Solanaceae: Petunia X hybrida ("violacea")

These plants are widely cultivated for ornamental use in North America, but it does not generally persist in the wild. There are colls. are from HOPK, PIKE and ROWA, but probably just near old home sites and not truly naturalized. These plants are considered a variable hybrid taxon (with 2n = 14 and 28), derived from P. integrifolia (Hook.) Schinz & Thellung and P. axillaris (Lam.) B.S.P.

ALI SA.

1744--Ipomoea coccinea L.

Convolvulaceae: Ipomoea <Quamoclit> coccinea

It is not clear if this annual of warmer American regions is native as far north as the central Mississippi and Ohio Valleys (Y, W). There was some early ornamental use in this region (F, Cr), and the first report from Ky. was in 1914 (Gm). Horticultural hybrids with quamoclit may also be expected (Y, W), though coccinea reportedly differs in chromosome number ($2n = 28$, versus 30 as in most *Ipomoea*). *I. hederifolia* L. is another closely related tropical species that has been reported erroneously from Ky. (M) and nearby states (W, Y).

ALI s. **HAB** H-8,10 ::? C 6. **ABU** +4.

1745--*Ipomoea quamoclit* L. C

Convolvulaceae: *Ipomoea* <Quamoclit> *quamoclit* (*Q. vulgaris*)

This tropical annual is common on the southeastern Coastal Plain but rarely established in Ky. There are colls. from FAYE (KY-Agr.) and MADI (BEREA) that may be from persistent plantings or locally escaped. In 1914, Gm noted: "An old ornamental, sometimes found holding its own in out-of-the-way places." See notes under *coccinea*.

ALI SA?

1746--*Ipomoea muricata* (L.) Jacq.

Convolvulaceae: *Ipomoea* <Quamoclit> *muricata* (*turbinata**)

This was recently found on Wolf Island in HICK (EKY) by R. Jones and his class, and reported under the synonym *I. turbinata* Lag. (Clark et al. 2005). It may originate from Mexico, but has become scattered across the Coastal Plain of southeastern states in recent decades, sometimes as a contaminant in soybean seed (W). It has violet or lavender flowers with narrow, 3-7 cm long tubes, and also been cultivated as an ornamental ("lilacbell").

ALI S. **HAB** H-10 ::? D? 6. **ABU** +4.

1747--*Ipomoea purpurea* (L.) Roth

Convolvulaceae: *Ipomoea purpurea*

This is the commonly cultivated "morning-glory" from tropical America. It is often escaped and locally weedy. The first report of wild plants from Ky. was in 1914 (Gm). There are varied color forms, and plants with lobed leaves have been occasionally reported in other states (Cr, Y). Another cultivated species with various color forms is *I. tricolor* Cav., which originates from Central America and may be locally escaped in southeastern states (PL, Y). *I. tricolor* can be confused with *purpurea*, but differs in its glabrous sepals and pedicels (versus conspicuously pubescent) and its 2-lobed stigmas (versus 3-lobed); it is probably closer to *pandurata* (Y).

ALI SA. **HAB** H-10 :: D 6. **ABU** +6.

1748--*Ipomoea hederacea* Jacq.

Convolvulaceae: *Ipomoea hederacea*

This weedy annual is widespread in warmer American regions, and may have been present in southeastern states before settlement (W). A related tropical species, *I. nil* (L.) Roth, has been erroneously reported from Ky. in some earlier lists (M). The first probable report of *hederacea* in Ky. was by Rafinesque (1836b, 4:73-75; as "*Cleimera hirsuta*"). Some colls. with entire leaves from CARL (MUR), FAYE (KY-Agr.) and perhaps elsewhere are referable to the more southern var. *integriuscula* Gray, but that taxon may not deserve recognition (Cr, Y, W and their citations).

ALI s. **HAB** H-10 :: D 6. **ABU** g10 s10? +3?

1749--*Ipomoea lacunosa* L.

Convolvulaceae: *Ipomoea* <*Eriospermum*> *lacunosa*

This annual is widespread across southeastern states along alluvial shorelines and in the edges of fertile fields. Colls. from BRAC (KNK), HARR (JC), HICK (MUR) and elsewhere have pink-purple flowers, referable to forma *purpurata* Fern. That form may be more frequent than typical white-flowered plants in some parts of the Bluegrass region. An obscure hybrid origin has been suggested for *purpurata* (Y).

HAB f-9,10,2 ::? D 6. **ABU** g9 s9 -1?

1750--*Ipomoea pandurata* (L.) G.F.W. Mey.

Convolvulaceae: *Ipomoea* <*Eriospermum*> *pandurata*

This is the most widespread native species of *Ipomoea* in eastern and central states, where it is also the only perennial member of the genus, with a large tuberous root. Colls. from FAYE (KY) and KENT (B) may be referred to var. *rubescens* Choisy, with reddish flowers.

HAB f-10,12,1? ::? C 4? **ABU** g10 s10 -2?

1751--*Calystegia spithamea* (L.) Pursh

Convolvulaceae: *Calystegia* [*Convolvulus*] *spithamea*

This is a common species of dry infertile sandy or limey soils in northeastern regions, but it is absent south of the Appalachians. Segregates may be worth recognizing (W; M. Homoya, pers. comm.), with plants varying much in overall pubescence, stature, and climbing tendency. Var. *pubescens* (Gray) Fern. (= ssp. *stans* (Michx.) Brummit) is known from southern Appalachian regions, especially on shale in the Ridge-and-Valley, and it may be expected

in Ky. It is tomentose (versus glabrous to pubescent), with leaves more folded and with larger lobes (W).

HAB f-10,12,7 ::? C 4. **ABU** g9 s8 -2.

1752--Calystegia sepium (L.) R. Br.

Convolvulaceae: *Calystegia* [*Convolvulus*] *sepium* {with vars. or ssp.}
Mapping here is provisional. *C. sepium* has been defined as a complex species that is widespread across cool temperate regions of North America and Eurasia; see also notes under *fraterniflora* and further discussion in Y. Plants of European origin (*ssp. sepium sensu stricto*) may occur widely in North America (F), but these are difficult to distinguish from supposedly native northeastern plants known as *Calystegia sepium ssp. americana* (Sims) Brummitt (including var. *communis* of R. Tryon). Narrow-leaved plants formerly known as *Convolvulus sepium* var. *repens* (L.) Gray (but misapplied), with records from HARL (B, Brummitt 1980) and ROCK (B), may now be referred to *Calystegia sepium ssp. appalachiana* Brummitt. Other variants expected in the state are *ssp. angulata* Brummitt (a northern and western taxon, appearing transitional to *fraterniflora*), and *ssp. erratica* Brummitt (from Ill., Ind., Mich., Pa., N.Y., N.J. & Ont., with bracteoles merging into sepals and with strongly occluded leaf sinus).

ALI EU. **HAB** F-10 :: D 6. **ABU** +5?

1753--Calystegia sepium (L.) R. Br. ssp. appalachiana Brummitt R

Convolvulaceae: *Calystegia* [*Convolvulus*] *sepium ssp. appalachiana*
See comments under *ssp. sepium*.

1754--Calystegia fraterniflora (Mackenzie & Bush) Brummitt

Convolvulaceae: *Calystegia* [*Convolvulus*] *fraterniflora* (*silvatica ssp. f.*; *sepium* var. f.*)

This occurs mostly in east-central and midwestern states on damp fertile soils. In Ky. distinction from *sepium* needs to be reviewed further; apparent hybrids have been documented in Mo. (Y). The taxonomy and biogeography of this group has remained uncertain, despite significant contributions by Brummitt (1980) and Mohlenbrock (1982). *C. fraterniflora* is close to the Mediterranean *C. silvatica* (Kit.) Griseb., and has been treated as *C. silvatica ssp. fraterniflora* (Mackenzie & Bush) Brummitt. Brummitt (1980) described related Chinese plants as *ssp. orientalis*.

C. fraterniflora is distinguished from *sepium* by its "sac-shaped, overlapping, obtuse bracteoles" (versus keeled, separate, acute to subobtusely);

sharp-angled leaf lobes (versus sharp to blunt), the quadrangular sinus with nearly parallel sides (versus U or V shaped); and flowers consistently white (versus usually pink in eastern states).

HAB F-10,8 :: D 6. **ABU** g10 s10 +3?

1755--Calystegia pubescens Lindl. C

Convolvulaceae: *Calystegia* [*Convolvulus*] *pubescens* (*pellita**, *hederacea*)
This Japanese species is occasionally cultivated, especially the double-flowered form known as "California rose." It has been reported as escaped in FRAN, but may not be truly naturalized (Wharton & Barbour 1991; J). The correct name has been uncertain, but may now be resolved (W).

ALI AS.

1756--Convolvulus arvensis L.

Convolvulaceae: *Convolvulus arvensis*

This perennial weed is widespread across temperate regions of North America. The first report from Ky. was in 1914 by Gm, who noted: "This pest is one of the worst occurring in Kentucky... [but] Pasturage with hogs or sheep is said to destroy the weed." Plants often recover from herbicides or other disturbance, and then occasionally produce diminutive shoots with leaves as small as 5-10 mm long.

Distinction of *Convolvulus* from *Calystegia* (diagnosed by its large bracts around the calyx) remains controversial at the global level, but the separation has been maintained in recent North American floras (e.g. Cr, Y, J, W). *C. arvensis* has a much higher chromosome number than the *Calystegia* species in eastern states ($2n = 48$ or 50 versus 20 or 22), and it spreads with running roots rather than rhizomes (Cr).

ALI EU. **HAB** R-10 :: D 6. **ABU** +6.

1757--Cuscuta cuspidata Engelm.

Cuscutaceae [*Convolvulaceae*]: *Cuscuta* <*Grammica*> *cuspidata*

This bracteate species occurs mostly in prairies of the midwest and Great Plains (F). It is close to *compacta* and records from eastern regions should be rechecked.

HAB f-10,12,9? C 5. **ABU** g9 s8? -3?

1758--Cuscuta compacta Juss. ex Choisy

Cuscutaceae [*Convolvulaceae*]: *Cuscuta* <*Grammica*> *compacta*

This bracteate species is widespread in lowlands of southeastern and south-central states. See note under *glomerata*.

HAB f-9,6 C? 5. **ABU** g9 s8? -3?

1759--*Cuscuta glomerata* Choisy

Cuscutaceae [Convolvulaceae]: *Cuscuta* <Grammica> *glomerata*

This bracteate "dodder" occurs mostly in midwestern regions, especially on tall herbs in Asteraceae (F). The only confirmed Ky. coll. is from *Helianthus* and *Silphium*, at a swale of Eastview Barrens in HARD (MM for WKY & KY). Colls. have also been reported WARR (Pr; check MO) and perhaps elsewhere (M).

HAB f-9,10? C? 5. **ABU** g8? s2? -4?

1760--*Cuscuta indecora* Choisy

Cuscutaceae [Convolvulaceae]: *Cuscuta* <Grammica> *indecora*

This papillate-flowered species (W, Y) occurs widely in western and southern states, Mexico and West Indies, especially in damp to dry sandy open habitats (F). There are few verified records from Ky. and Tenn. (Ch). Colls. from Ky. can all be referred to var. *neuropetala* (Engelm.) A.S. Hitchc., but that variety is not recognized in recent treatments.

HAB f-9,10? D? 5. **ABU** g10 s7? -4?

1761--*Cuscuta coryli* Engelm. R

Cuscutaceae [Convolvulaceae]: *Cuscuta* <Grammica> *coryli*

This papillate-flowered species occurs mostly in northern and western regions. *C. coryli* is close to the more southern *indecora*, and occurs in similar habitats. But it is much less common, and has been considered globally imperiled or vulnerable (G2G3) by Costea et al. (2006c). In Ky. colls. have been from reported HARD (MM #19271-89 for WKY) and probably elsewhere (M; Costea et al. 2006c), but details are not yet available.

1762--*Cuscuta pentagona* Engelm.

Cuscutaceae [Convolvulaceae]: *Cuscuta* <Grammica> *pentagona*

This quasi-tetraploid (2n = 56) is widespread in temperate regions of North America. It is the most commonly collected species of *Cuscuta* from Ky., on a wide variety of hosts in diverse habitats. See notes under the closely related *campestris*.

HAB f-10,8,1,12? D 6? **ABU** g10 s10 +1?

1763--*Cuscuta campestris* Yuncker

Cuscutaceae [Convolvulaceae]: *Cuscuta* <Grammica> *campestris* (?arvensis)
This widespread southern species, ranging into tropical regions, is close to the more eastern *pentagona* and *gronovii*; mapping here is provisional. *C. campestris* may be predominant in states south of Ky. (e.g. Ch). Although combined with *pentagona* in some recent treatments, Costea et al. (2006a; in prep. for FNA) have confirmed its distinction. It differs in its larger flowers, more broadly triangular corolla lobes, and less imbricate calyx lobes (F); see also Y, with comparison to *gronovii*. Like *pentagona*, it occurs on a wide range of herbaceous hosts, and is often abundant in cultivated fields on uplands.

HAB f-10,8? D? 6? **ABU** g10 s8? +1?

1764--*Cuscuta gronovii* Willd. ex J.A. Schultes

Cuscutaceae [Convolvulaceae]: *Cuscuta* <Grammica> *gronovii*

This tetraploid (2n = 60) is widespread in eastern North America, and one of the commonest species of *Cuscuta* in Ky. It occurs on many hosts in diverse habitats, but usually on damper soils than *pentagona* and flowering a month or so later in Jul-Sep (F; D. Boone, pers. comm.). In addition to typical *gronovii*, var. *latifolia* Engelm. is expected in the state but colls. have not been checked. That taxon differs in its relatively elongate, less overlapping calyx lobes, and shorter corollas with more elongate lobes, resembling *C. polygonorum* (Costea et al. 2006b).

HAB f-9,2,1 C? 6? **ABU** g10 s9? +1?

1765--*Cuscuta rostrata* Shuttlw. ex Engelm. & Gray R

Cuscutaceae [Convolvulaceae]: *Cuscuta* <Grammica> *rostrata*

This southern Appalachian species is close to *gronovii*. It has been reported from BELL, with a coll. by R. Cranfill (Univ. of California, Berkeley) that needs to be checked (M). In Tenn. *rostrata* is known only from the Blue Ridge (Ch).

1766--*Cuscuta polygonorum* Engelm.

Cuscutaceae [Convolvulaceae]: *Cuscuta* <Grammica> *polygonorum*

This 3- or 4-merous species occurs from mid-Atlantic states to the midwest, usually in wetlands on *Polygonum* spp. and associated herbs. Costea et al. (2006) considered it globally vulnerable (G3). The related 5-merous species, *C. obtusiflora* Kunth., is known mostly from Gulf Coastal states and the West Indies, but it has been reported from Ky. (Hoagland & Jones 1992). A verified coll. of *obtusiflora* has not been located, and it was excluded by J (see also W and citations).

HAB f-9,2 D? 6? **ABU** g7? s7? -2?

1767--*Cuscuta cephalanthi* Engelm.

Cuscutaceae [Convolvulaceae]: *Cuscuta* <Grammica> *cephalanthi*

This 3- or 4-merous species is widespread in wetlands of northern and western states but rare in the southeast (K, W). In Ky. it has been reported only from CALL (Funk & Fuller 1978; check MUR), ROWA (B; check US) and UNIO (Shacklett 1937; check KY-Agr.). Colls. probably exist to support these reports, but have not been confirmed.

HAB 2,9? C? 5. **ABU** g10 s5? -4?

1768--*Cuscuta epithymum* (L.) L.

Cuscutaceae [Convolvulaceae]: *Cuscuta* *epithymum*

This is the only alien species of *Cuscuta* known from the state, and the only one in the distinct subgenus *Cuscuta* (with $n = 7$ versus mostly 15 in *Grammica*). All records in Ky. were made during 1902-1914, when several counties were listed by Gm, but few colls. have been found. *C. epithymum* became epidemic in fields of clovers and alfalfa, commonly contaminating seeds collected from the crops. Intensive inspection and management appears to have eradicated the species in Ky., but it may still be widely scattered across northern states and adjacent Canada (F, Cr, PL).

ALI EU. **HAB** H-10 D? 6. **ABU** +4<.

1769--*Ilex opaca* Ait.

Aquifoliaceae: *Ilex opaca*

This southeastern species was originally concentrated on relatively acid soils, especially in Appalachian regions, but it has now become widely cultivated. Open dots in the map include unverified historical data of Gm, plus colls. that may not be from truly native plants. Seedlings occasionally establish from plantings, and it is becoming difficult to distinguish native plants in less forested regions. A horticultural hybrid with the southeastern species, *Ilex myrtifolia* Walt, is known as *X attenuata* Ashe; it is widely grown and has escaped locally near the arboretum at Bernheim Forest (BULL).

HAB 7,6,5,11 B 3. **ABU** g10 s9 -2.

1770--*Ilex cornuta* Lindl. & Paxton C

Aquifoliaceae: *Ilex cornuta*

This commonly cultivated Chinese species has begun to escape occasionally in southeastern states, especially Ala. (SE, W). It has been recently found as an escape in MADI on the campus of Eastern Ky. Univ. (Clark et al. 2005)

and perhaps elsewhere. But there is no evidence that this species is spreading into the countryside. Other alien cultivated hollies may be expected, and Bernheim Forest in BULL has a famous planted collection of over 350 cultivars, paradise for ilicimaniacs (Gunn 1959). However, there are no reports so far that any species of this collection have become locally invasive. **ALI** AS.

1771--*Ilex decidua* Walt.

Aquifoliaceae: *Ilex decidua*

This is widespread in swampy lowlands of southeastern states.

HAB 6,4,7 C 3. **ABU** g9 s9 -3.

1772--*Ilex montana* Torr. & Gray ex Gray var. *montana*

Aquifoliaceae: *Ilex montana* (*monticola*, *ambigua* var. *m.**)

This Appalachian species has been combined with the more southern *I. ambigua* (Michx.) Torr. by some recent authors, as *I. ambigua* var. *monticola* (Gray) Wunderlin & Poppleton. But there is virtually no overlap in range or morphology (W). Reports of typical *ambigua* from the Cumberland Plateau of Ky. (M, J, CW) and Tenn. (Ch) may all be based on plants of *montana* with relatively small hairy leaves. These include some of the colls. from MCRE, POWE and WOLF (KY). Such plants have often been referred to *I. beadlei* W.W. Ashe or to *I. montana* var. *mollis* (Gray) Britt., but those names have been misapplied to *montana* (W). There are also old unverified disjunct reports of "*Ilex mollis*" from EDMO (Hussey 1876; Pr).

HAB 5,7 A 2. **ABU** g8 s8 -1.

1773--*Ilex verticillata* (L.) Gray

Aquifoliaceae: *Ilex verticillata* (*padifolia*)

Several varieties of this widespread eastern species have been described by ilicimaniacs (F), but these have been combined in recent treatments (W). Most plants in Ky. have been referred to the relatively hairy var. *padifolia* (Willd.) Torr. & Gray ex S. Wats. A few colls. from MCRE and PULA would be referable to var. *verticillata* instead.

HAB 6,9,2 B 3. **ABU** g9 s9 -3.

1774--*Hedera helix* L.

Araliaceae: *Hedera helix*

This widely cultivated species is native to the oceanic climate of western Europe (usually known as "English ivy"). It has become locally abundant at scattered sites in southeastern states, due to vegetative spread. As a high-

climbing vine, *Hedera* has not been able to tolerate winters in most of the mid-west, though it may persist as ground-cover. In Ky., at least, there is no evidence of establishment from seed. Flowering occurs during the fall or mild winters, but subsequent production of seed may generally fail due to cold. Most plants in North America are tetraploids, within the context of most Araliaceae ($2n = 48$), but octoploids (known as "Irish" or "Atlantic" ivy) are also cultivated and may be expected to escape (Y).

ALI EU. **HAB** f-11,7,5 D 2. **ABU** +5*.

1775--*Eleutherococcus pentaphyllus* (Sieb. & Zucc.) Nakai C

Araliaceae: *Eleutherococcus* [*Acanthopanax**] *pentaphyllus* (A. sieboldianus*)

This East Asian shrub does not seem to have spread far from cultivation in eastern states. In Ky. there are colls. from GRAN (KNK), JEFF (KNK) and WHIT (EKY) that appear to be true escapes (M; Clark et al. 2005), but no reproducing populations are yet documented in the wild. A coll. from LYON (APSU) was a plant persistent after cultivation.

ALI AS.

1776--*Aralia nudicaulis* L.

Araliaceae: *Aralia* <*Nanae*> *nudicaulis*

This acaulescent rhizomatous herb is widespread in northern and western regions. In Ky. it is currently known from a few sites in or near the Cumberland Mts. There are also old colls. reported from LEWI, ROWA (B; check US), and perhaps elsewhere (BA), which need to be located and verified.

HAB 5,11 B 1? **ABU** g10 s5 -1.

1777--*Aralia spinosa* L.

Araliaceae: *Aralia* <*Dimorphanthus*> *spinosa*

This small rhizomatous tree is widespread across southeastern states, and more or less adventive north of the glacial limit (Cr). In Ky it is concentrated in submesic sites on acid soils.

HAB 8,7,6,11? B 4. **ABU** g10 s9 -2.

1778--*Aralia racemosa* L.

Araliaceae: *Aralia* <*Aralia*> *racemosa*

This tall herb is widely scattered over eastern and central North America, except on most of the southeastern Coastal Plain. It is generally restricted to relatively undisturbed mesic woodlands on acid soils.

HAB 5,7 B 2. **ABU** g9 s8 -2.

1779--*Aralia hispida* Vent. R

Araliaceae: *Aralia* <*Hispidae*> *hispida*

This rhizomatous herb is a northern species of dry, thin or disturbed woods that extends south in the Appalachians to w. N.C., but it is unlikely in Ky. (M). It has been reported from Ky. by Pr (addenda) and BA (citing a coll. at KY-Agr. which cannot be found), but it may have been confused with *racemosa*.

1780--*Panax trifolius* L.

Araliaceae: *Panax trifolius*

[Previous spelling as "trifolium" is generally considered incorrect (W).] This species is widespread in northeastern and Appalachian regions. In Ky. it is generally restricted to mesic woods on lower slopes and terraces with medium acid, sandy soils. Although the plant locally forms large populations (probably with though clonal divisions), it has a highly fragmented distribution in the state, suggesting great sensitivity to past disturbance (especially rooting by hogs). *P. trifolius* differs from *quinquefolius* in several fundamental characters (Philbrick 1983; Cr, W and cited literature). It has short rhizomes that are attached to globose roots (versus no rhizomes and fusiform roots); leaves are smaller and less divided; flowers are androdioecious (versus monoecious); ripe berries are yellow-green (versus bright red); $2n = 24$ (as in most native Araliaceae) versus 48.

HAB 5,4 C 1. **ABU** g8 s6 -2.

1781--*Panax quinquefolius* L.

Araliaceae: *Panax quinquefolius*

[Previous spelling as "quinquefolium" was incorrect (W, Y).] This species is widespread in eastern North America, but rare to absent on the southeastern Coastal Plain. This medicinally potent herb is still widely scattered over Ky., usually on medium-acid soils in mesic to somewhat subxeric woods. But intense repeated harvesting has continued to greatly reduced its density, especially in economically troubled Appalachian regions. Even in the best habitats, a day of general botanical survey rarely reveals more than 5-10 plants. Yet Ky. reportedly leads the nation in its annual harvest, estimated to be about 30,000 lbs (dried); see Y and International Herald-Tribune (2007).

HAB 5,11,7 C 2. **ABU** g8 s7 -5.

1782--*Hydrocotyle sibthorpioides* Lam.

Araliaceae: *Hydrocotyle sibthorpioides* (rotundifolia)

This species from warm wet regions of Asia and Africa has become locally naturalized in lawns at scattered sites across eastern states. The first record from Ky. was in 1914 (Gm).

ALI AS. HAB S-9? ::? D? 6? **ABU** +4.

1783--*Hydrocotyle ranunculoides* L. f.

Araliaceae: *Hydrocotyle ranunculoides*

This subaquatic species is widespread in warmer American regions. In Ky. it was recently collected from GRAV (EKY) and HEND by D. White (KSNPC); see also Clark et al. (2005).

HAB 2,3 ::? C? 4? **ABU** g10 s2 -4.

1784--*Hydrocotyle americana* L.

Araliaceae: *Hydrocotyle americana*

In Ky. this northeastern species of boggy seeps is known from few verified sites. It was rediscovered in MCRE during 1987 (Palmer-Ball et al. 1988), but B's site in ELLI (US) has not been relocated. Details of recent reports by KSNPC are not yet available.

HAB 6,9? ::? B? 3? **ABU** g10 s2 -4.

1785--*Sanicula trifoliata* Bickn.

Apiaceae <Saniculoideae>: *Sanicula trifoliata*

This biennial occurs in east-central states, and is largely restricted to relatively deep woods on mesic fertile soils. In contrast to other eastern species of Sanicular, trifoliata has staminate flowers on long pedicels (ca. 3-8 mm versus 0.5-3 mm); and it has larger fruit (ca. 6-8 mm long versus 3-6 mm), including calyx lobes that are connivent into a 2-2.5 mm beak (Cr, W).

HAB 5,7 D? 2. **ABU** g9 s9 -3.

1786--*Sanicula canadensis* L.

Apiaceae <Saniculoideae>: *Sanicula canadensis*

This somewhat weedy biennial is widespread in eastern states. In Ky. colls. from FRAN and perhaps CLAR (KY) are referable to var. grandis Fern., which may be a somewhat distinct, relatively northern taxon. Further study is needed; in some characters, var. grandis suggests a transition to marilandica (F, W and citations). However, despite mostly sharing similar phenology and the same chromosome number (2n = 16), *Sanicula* species in North America are not known to hybridize.

HAB f-7,10,11,4 :: D 3. **ABU** g10 s10 -2.

1787--*Sanicula smallii* Bickn.

Apiaceae <Saniculoideae>: *Sanicula smallii*

This southeastern perennial occurs in woods on relatively dry acid soils. In addition to its distinctive thickened roots, the plant can often be recognized from its less dissected leaves (only 3-parted and without sharp coarse serrations) that have a bluish hue and somewhat leathery texture.

HAB 11,7 B 2. **ABU** g9 s9 -2.

1788--*Sanicula odorata* (Raf.) K.M. Pryer & L.R. Phillippe

Apiaceae <Saniculoideae>: *Sanicula odorata* (gregaria)

This perennial is widespread across eastern North America, usually growing in disturbed woods on submesic to subxeric base-rich soils. It tends to occur in extensive dense populations (suggesting vegetative spread but not so), which often appear to develop in woods that have been influenced by past browsing of livestock plus continued influence of deer.

HAB 7,11,5 E 2. **ABU** g10 s9 -3.

1789--*Sanicula marilandica* L. var. *petiolulata* Fern.

Apiaceae <Saniculoideae>: *Sanicula marilandica** var. *petiolulata*

Typical marilandica is a perennial that ranges widely across western (montane) and northern states plus adjacent Canada; it extend down the Appalachians to Ga. but is unknown in Ky. (W). Var. *petiolulata* is disjunct in southeastern states, and most common on acid soils of the Coastal Plain. In Ky. it is known only from thin disturbed woods and rights-of-way on relatively broad sandy ridges of the Cumberland Plateau. This taxon deserves further investigation and may deserve species status; the only difference noted in existing literature is that lower leaves have longer petiolules (F, W).

HAB 10,7,12 B 4. **ABU** g8 s6 -3.

1790--*Eryngium prostratum* Nutt. ex DC.

Apiaceae <Saniculoideae>: *Eryngium prostratum*

This southeastern species occurs in varied types of shorelines, marshy or boggy places. It is most frequent on or near exposed ground that is suitable for its prostrate growth-form, rooting at the nodes. Rafinesque (1836, 4:35) appears to have named this plant *Streblanthus auriculatus*: "in the Western glades of Kentucky."

HAB 9,2? ::? C? 5. **ABU** g8 s7 -4.

1791--*Eryngium integrifolium* Walt.

Apiaceae <Saniculoideae>: *Eryngium integrifolium*

This southeastern species is largely restricted to acid soils with seepage of ground water. In Ky. the only verified population is at the Blood Rv. seeps in CALL (R. Athey colls. at EKY). *E. aquaticum* L. is a related species of the Atlantic Coastal Plain that was reported by Adams et al. (1968) from HICK at Murphys Pond, presumably based on *integrifolium* (M).

HAB 9 B? 4. **ABU** g8 s2 -4.

1792--*Eryngium yuccifolium* Michx.

Apiaceae <Saniculoideae>: *Eryngium yuccifolium* ("aquaticum")

This is widespread in eastern states, except northeastern regions. It is the only eastern species of *Eryngium* not concentrated on dry sites; also, $2n = 96$ versus 16 in most others. In Ky. it is generally restricted to remnants of native grassland on medium acid soils with rather low fertility.

HAB 10,12,9 C 4. **ABU** g10 s7 -5.

1793--*Erigenia bulbosa* (Michx.) Nutt.

Apiaceae <Osmorhiza group>: *Erigenia bulbosa*

This monotypic genus occurs in mesic woods on base-rich soils of east-central states, centered in the Ohio Valley. It is one of the earliest species to flower, mostly during late Feb-early Apr in central Ky., but as early as the last week of Jan during some years since 1990; Short (1828-9) reported 1st-15th Mar. Based on Buddell & Thieret's thorough account (1985), *Erigenia* has several other unusual features in its life-cycle, including only one developed cotyledon (as in *Claytonia virginica* and *Dicentra cucullaria*). It is one of the few eastern Apiaceae with tubers, and they are highly palatable to generalist herbivores. In agricultural regions of Ky., *Erigenia* is often restricted to remnants of older woods that have probably escaped past rooting by hogs. The tubers, known as "turkey-peas" in n. Ky., were even eaten by children in large quantities during earlier times (Nelson 1918).

HAB 5,7,4? E 1. **ABU** g9 s9 -3.

1794--*Spermolepis echinata* (Nutt. ex DC.) Heller

Apiaceae <Osmorhiza group>: *Spermolepis echinata*

This annual occurs mostly in prairies of south-central states. It is known in Ky. from only two colls. of R. Athey in the 1970s, from FULT and MCRA (presumably at MEM).

HAB f-10,12? D? 5. **ABU** g9 s2? -5.

1795--*Osmorhiza claytonii* (Michx.) C.B. Clarke

Apiaceae <Osmorhiza group>: *Osmorhiza claytonii*

This is widespread in mesic woods of eastern North America, except on the southeastern Coastal Plain. The more western species, *O. chilensis* Hook. & Arn., was reported from by BA but apparently in error (M).

HAB 5,7 D 2. **ABU** g10 s10 -3.

1796--*Osmorhiza longistylis* (Torr.) DC.

Apiaceae <Osmorhiza group>: *Osmorhiza longistylis*

This is widespread across eastern and central North America, except on the southeastern Coastal Plain. It is more concentrated on base-rich soils than *claytonii*, where the woods tend to be more disturbed. See W for detailed key.

HAB 7,4 E 2. **ABU** g9 s9 -4.

1797--*Chaerophyllum tainturieri* Hook.

Apiaceae <Osmorhiza group>: *Chaerophyllum tainturieri*

In Ky. this weedy winter-annual of southeastern states has sometimes been confused with *procumbens*, especially in early records (e.g. Gm). The first reliable records of *tainturieri* were not until the 1930s (Greenwell 1935; B), and it may have spread north into Ky. after settlement. It is often associated with roadsides.

HAB R-10,12 ::+ D 6. **ABU** g9 s9 +1?

1798--*Chaerophyllum procumbens* (L.) Crantz var. *procumbens*

Apiaceae <Osmorhiza group>: *Chaerophyllum procumbens* var. p.

This winter-annual is widespread in eastern states, except on the southeastern Coastal Plain. Distinction from the more southern *tainturieri* is sometimes difficult, and has been based on varied characters (F, Cr, Y, J, W). Hybrids have not been clearly documented, but might be expected; $2n = 22$ in both. The fruits of *procumbens* are usually (except in var. *shortii*) glabrous or nearly so (versus usually pubescent), broadest near the middle (versus below), more narrowly ribbed, and on stalks that are less thickened at the summit. Lower leaf surfaces and stems below the middle are usually much less pubescent.

HAB f-7,8,4 ::? E 3. **ABU** g9 s9 -3.

1799--*Chaerophyllum procumbens* (L.) Crantz var. *shortii* Torr. & Gray

Apiaceae <Osmorhiza group>: *Chaerophyllum procumbens* var. *shortii*

This variety seems distinct from typical plants, and perhaps concentrated in the central Ohio Valley (but see Y). According to F its fruits are more broadly oblong to narrowly ovate, glabrous or minutely pubescent (versus glabrous),

4.5-6.5 x 2-2.5 mm (versus 6-10 x 1.5-2 mm), not contracted at summit; and it is often earlier flowering. Further research is needed to clarify its status.

HAB f-7,8,11? ::? E 3. **ABU** g7? s7? -3.

1800--*Anthriscus sylvestris* (L.) Hoffm. R

Apiaceae <Osmorhiza group>: *Anthriscus sylvestris*

This weedy biennial is thinly scattered across northeastern and northwestern regions (especially Wash.), but it is not much established in North America. The only record from Ky. is the obscure report by McMurtrie (1819). *A. caucalis* M. Bieb. is a European annual that may be expected (Ch, J, Y); it has more hispidulous leaves and prickly fruits (2n = 14 versus 16).

ALI EU.

1801--*Torilis arvensis* (Huds.) Link

Apiaceae <Osmorhiza group>: *Torilis arvensis*

This annual weed from southern Europe is widespread and locally abundant in eastern states, especially on base-rich soils. *Torilis* was first reported from Ky. as "japonica" during the 1940s (B, Slack 1941, Wharton 1945), but based on misidentifications of *arvensis*; see notes under *japonica*. *T. arvensis* has become a locally abundant weed in Ky., especially in the Bluegrass Region.

ALI EU. **HAB** F-10,8 :: E 6. **ABU** +6.

1802--*Torilis japonica* (Houtt.) DC. T

Apiaceae <Osmorhiza group>: *Torilis japonica* ("anthriscus")

This Eurasian annual is scattered in northeastern regions, but less common than *arvensis*, which has been confused in some North American treatments (W, Y). Further checking of Ky. colls. is needed, but the few confirmed records of *japonica* date mostly from after 2000. It differs from *arvensis* in having 5-12 rays per umbel (versus usually 3-5), with (3) 4-10 (12) bracts at the base of each involucre (versus 0-1 or occasionally 2); bristles on fruits tend to be shorter (0.4-0.8 mm versus 0.6-1.1 mm) and more ascending (versus nearly perpendicular); 2n = 16 versus 12.

ALI EU? **HAB** F-10 :: D? 6. **ABU** +4*.

1803--*Conium maculatum* L.

Apiaceae <Osmorhiza group>: *Conium maculatum*

This tall toxic biennial weed is widely naturalized in temperate regions of North America, but it is only common on moist fertile soils. It was first reported from Ky. in 1914 (Gm), when it had already "spread over much or all of the best agricultural sections, and... likely to be found by roadsides and

pastures anywhere in Kentucky." It was concentrated in the Bluegrass region initially but become much more widely abundant after 1980, especially along major roads. Attempted control with herbicides in May-June is often too late to prevent seeding, and may actually reduce competitive pressure on its seedlings in the fall (especially where crown-vetch is killed).

ALI EU. **HAB** F-10,8,7,4 E 4. **ABU** +6*.

1804--*Taenidia integerrima* (L.) Drude

Apiaceae <*Zizia* group>: *Taenidia integerrima*

This monotypic genus (W) is widespread in woods on dry base-rich soils across eastern Northern America, but absent from most of the southeastern Coastal Plain.

HAB 11 E 3. **ABU** g10 s9 -3.

1805--*Zizia aurea* (L.) W.D.J. Koch

Apiaceae <*Zizia* group>: *Zizia aurea*

This is widespread in eastern North America, usually in thin woods and edges on damp base-rich soil. In Ky. it is generally concentrated in low woods along streams, where subject to flooding and browsing. Rarely, it also survives in remnants of native vegetation on uplands. See key in W to all eastern species of *Zizia* and *Thaspium*; species of these genera are often confused. These are two of the more diverse genera in eastern North America, yet no hybrids are known within them or between them, despite all sharing the same chromosome number (2n = 22 as in most Apiaceae) and flowering in similar seasons.

HAB 1,4,8 E 4. **ABU** g10 s8 -4.

1806--*Zizia trifoliata* (Michx.) Fern. R

Apiaceae <*Zizia* group>: *Zizia trifoliata*

This is known mostly in or near the southern Appalachians, but there are disjunct populations in southeastern states from e. Ark. to n. Fla. (PL). There has been confusion with *Z. aurea* (and perhaps with *Thaspium trifoliatum* in name); see W for a detailed key. No verified colls. of *Z. trifoliata* from Ky. have been located (M), but there have been some authoritative reports (e.g. Gl, Cr), and it is known from adjacent counties of w. Va.

1807--*Zizia aptera* (Gray) Fern.

Apiaceae <*Zizia* group>: *Zizia aptera* (cordata)

This species occurs from east-central states to the Great Plains and beyond (?), often in "moist" habitats (F, Cr, W); only var. *aptera* occurs in the east. In Ky.

aptera typically occurs in thin dry upland woods and edges on somewhat base-rich soils. It is also frequent on seasonally xeric boulder-cobble bars along the Cumberland Rv. and its tributaries. It has often been confused with *Thaspium trifoliatum*.

HAB 11,12,7,10? D 4. **ABU** g10 s8 -3.

1808--*Polytaenia nuttallii*

Apiaceae <*Zizia* group>: *Polytaenia nuttallii*

In Ky., this midwestern species of the tall-grass prairie is known only from a few old records: (1) C.S. Rafinesque (1836, 4:32 as *Phaiosperma trifida*), "discovered in 1823 in the Western glades of Kentucky"; (2) C.W. Short from CHRI (Perkins 1938); (4) Pr (addenda) from WARR; (5) a 1971 coll. from a roadside in TRIG (R.H. Ellis at APSU; Chester & Wofford 1992). *P. nuttallii* also occurs in some adjacent counties of Ill., Ind. and Tenn. Within southeastern states, the largest concentration is in or near the Black Belt of Miss. and Ala.

HAB 10 D? 5. **ABU** g8 s1 -5?

1809--*Aegopodium podagraria* L.

Apiaceae <*Zizia* group>: *Aegopodium podagraria*

This variable rhizomatous plant ($2n = 22$ and 44) has been commonly cultivated in eastern North America, especially the variegated form (var. *variegatum* Bailey). It can spread vegetatively into adjacent woodlands, especially in cooler regions on damp fertile soils. There may also be occasional dispersal over greater distances: the coll. from LEWI (BEREA) is from Manchester Island in the Ohio River.

ALI EU. **HAB** h-4,7? D? 3. **ABU** +4.

1810--*Carum carvi* L.

Apiaceae <*Zizia* group>: *Carum carvi*

This cultivated biennial (caraway) is locally naturalized in northern states and adjacent Canada (F, Cr, W). Records from Ky. suggest that it has become naturalized only at scattered sites in western regions.

ALI EU. **HAB** H-10 ::? D? 5. **ABU** +4.

1811--*Cryptotaenia canadensis* (L.) DC.

Apiaceae <*Cryptotaenia* group>: *Cryptotaenia canadensis*

This short-lived monocarpic plant (often biennial) is widespread in eastern North America, usually growing in riparian woods or adjacent toeslopes (Hawkins et al. 2005). In Ky. it is generally common, but it has generally been

grazed out of farmland (as well as associated plants like *Amphicarpa*). It is closely related to *C. japonica* Hassk., which is cultivated in Japan for food, but the edible potential of *canadensis* has received rather little attention (Duke 2000). *C. canadensis* and *Perideridia americana* are the only eastern Apiaceae with chromosome numbers based on $n = 10$ (Cr).

HAB 4,6,7,5? :: D 2. **ABU** g10 s10 -3.

1812--*Perideridia americana* (Nutt. ex DC.) Reichenb.

Apiaceae <*Cryptotaenia* group>: *Perideridia americana*

This is a largely midwestern species of thin woods and prairies, usually on dry base-rich soils. It is unusual among eastern Apiaceae in its ability to spread vegetatively from tuberously thickened roots, which send out runners. These roots are edible to humans, and it is likely that rooting by hogs has greatly fragmented original populations. The few records in Ky. are mostly in the former Big Barrens region, plus a few in rocky woods of the central Bluegrass.

HAB 7,12,10? E 4. **ABU** g7 s4 -5.

1813--*Sium suave* Walt.

Apiaceae <*Cryptotaenia* group>: *Sium suave*

This subaquatic plant is widely scattered over temperate regions of North America, but generally restricted to relatively undisturbed marshy meadows and thin swampy woods. In Ky. it is rare and usually occurs in the margins of sloughs along larger streams and rivers. It may be a basal member ($2n = 12$) of a complex, wetland-concentrated, somewhat poisonous clade that includes *Cicuta* ($2n = 22$), *Oxypolis* (28-32), *Trepocarpus* (18) and *Ptilimnium* (14-32).

HAB 2,6? D? 4. **ABU** g10 s6 -4.

1814--*Cicuta maculata* L.

Apiaceae <*Cryptotaenia* group>: *Cicuta maculata* (var. m.)

This wetland species (as well as var. *maculata*) is widespread across temperate regions of North America. In Ky. it is associated with varied types of wetland, and sometimes survive in ditches and low field margins, but it is uncommon to absent in more agricultural landscapes.

A closely related segregate known as *C. maculata* var. *bolanderi* (S. Watson) Mulligan may also be expected in Ky. (Mulligan 1980; W). That taxon is reported from east-central states to the Great Plains, but it remains poorly understood and poorly documented. It is distinguished by its seeds, with

relatively narrow ribs and more abrupt constriction at the junction between pairs (W).

HAB 9,2 D? 4. **ABU** g10 s10 -3.

1815--*Cicuta bulbifera* L. R

Apiaceae <Cryptotaenia group>: *Cicuta bulbifera*

This northern species was reported from Ky. by Mulligan (1980), but details remain unknown (Cr, M). There are also records of uncertain status from Va., N.C. and Fla. (W). *C. bulbifera* is clearly distinct from *maculata*, with plants producing bulbils in axils of upper leaves and flowers usually aborting; also, leaf segments are narrowly linear (versus linear to lanceolate).

1816--*Oxypolis rigidior* (L.) Raf.

Apiaceae <Cryptotaenia group>: *Oxypolis rigidior*

This is widespread in wetlands on acid soils in eastern states, except New England.

HAB 9,6 B 3. **ABU** g9 s8 -3.

1817--*Trepocarpus aethusae* Nutt. ex DC.

Apiaceae <Cryptotaenia group>: *Trepocarpus aethusae*

This monotypic genus of southeastern lowlands is easily overlooked, and probably much more widespread than colls. indicate (see also Y). Reported colls. from Ky. are mostly accessed in Tenn. (by E.W. Chester at APSU and R. Athey at MEM). It is a winter-annual but matures seed relatively late, in Aug-Sep (C.C. Baskin et al. 2003).

HAB 4,6,7,8? ::? D? 4. **ABU** g8 s5 -4.

1818--*Ptilimnium capillaceum* (Michx.) Raf.

Apiaceae <Cryptotaenia group>: *Ptilimnium capillaceum*

This annual of open wetlands occurs on or near the southeastern Coastal Plain. In Ky. it is known only from a few sites on the Mississippian Embayment (Coastal Plain) and nearby wetlands of the Interior Low Plateaus.

HAB 2,9? ~? C? 6? **ABU** g9 s4? -5.

1819--*Ptilimnium nuttallii* (DC.) Britt.

Apiaceae <Cryptotaenia group>: *Ptilimnium nuttallii*

This wetland annual is known from the Ozark region, southern Interior Low Plateaus and Gulf Coastal Plain. In Ky. its distribution is similar to that of *capillaceum*, and there are no clear differences in habitat (M). *P. nuttallii* differs (Cr, W) in its longer styles (0.5-1.5 mm versus 0.2-0.5 mm), more

elongated seeds (subglobose and ca. 1.5 mm versus ovoid and ca. 2 mm), bracts mostly entire (versus mostly 3-cleft), and leaves with primary divisions alternate or opposite (versus commonly 3 at a node); 2n = 14 (versus 14 and 28). There has been some confusion between these taxa, and some records need to be rechecked.

HAB 9,2? ::? D? 6? **ABU** g8 s4? -5.

1820--*Ptilimnium costatum* (Ell.) Raf.

Apiaceae <Cryptotaenia group>: *Ptilimnium costatum*

This annual has a somewhat fragmented range from N.C. and Ga. to Mo. and Tex. (W). There are no clear differences in habitat from the other species of *Ptilimnium*. It is potentially the tallest species, up to 1.5 m (about double the others), with crowded verticillate leaf segments, and longer styles (1.5-3 mm versus 0.2-1.5 mm); 2n = 22 or 32 (versus 14 or 28).

HAB 2,9 ::? E? 6? **ABU** g6? s4? -5.

1821--*Aethusa cynapium* L.

Apiaceae <Cryptotaenia group>: *Aethusa cynapium*

This monotypic genus is a common weedy annual of Europe that is naturalized in northeastern states, but does not seem to be spreading within Ky. or more southeastern states (W). The few records here date only from 1893 (Pr) to 1947 (or perhaps an unverified record in 1975).

ALI EU. **HAB** H-10,8 ::? E? 4. **ABU** +4.

1822--*Bupleurum rotundifolium* L.

Apiaceae <Cryptotaenia group>: *Bupleurum rotundifolium*

This weedy annual has been widely naturalized in southeastern states, especially on calcareous soils. However, it is generally rare; in the Ohio Valley virtually all records come from the Bluegrass region, Nashville Basin and scattered sites in the Ridge & Valley region (K, SE). Moreover, most Ky. colls. were made during 1934-61, and none after 1970. Its disappearance must reflect some change in farmland management, such as decline in sheep pasture and conversion of marginal pastures to fescue (*Festuca arundinacea*). To call this an "invasive species" (SE) may be misguided.

ALI EU. **HAB** G-10 E 5? **ABU** +4<.

1823--*Ligusticum canadense* (L.) Britt. var. canadense

Apiaceae <Thaspium group>: *Ligusticum canadense* var. *c.*

This species occurs mostly in Appalachian regions and the Ozarks, but with scattered records in between. In Ky. typical plants usually occurs in thin

woods on submesic to subxeric sites with medium acid soils. Although widely scattered, it is rarely (if ever) common. A distinctive vegetative feature is the relatively straight and entire basal portion of each leaflet (W).

HAB 7,11,8 C? 3. **ABU** g8 s8 -3.

1824--*Ligusticum canadense* (L.) Britt. var. nov.

Apiaceae <Thaspium group>: *Ligusticum canadense* var. nov. {southern Appalachian variant}

These plants are known only from the southern Cumberland Plateau in Ky., Tenn. and Ala., and from in or near the southern Blue Ridge of Va., Tenn., N.C. and S.C. (GH, KY, NCU, TENN. They are generally restricted to naturally open habitats, especially on seasonally xeric rocky soils. In Ky. they are known only from the open boulder-cobble bars along the Cumberland River and its major tributaries.

This variant differs from typical *canadense* in its narrower leaf-segments: the largest segments of lower leaves are ca. 1-2.5 (3) cm wide (versus (2.5) 3-6.5 (7) cm); the largest of upper regular leaves are ca. (0.4) 0.7-1.5 (2.2) cm wide (versus (1) 2-3 (4) cm), and usually less serrated than lower leaves to almost entire (versus equally serrated or nearly so). Also, leaves are usually plain green (versus rather deep bluish-green); and stems usually do not darken much with age (versus dark blackish/purplish brown).

HAB 1 C? 5? **ABU** g5? s4 -1.

1825--*Thaspium trifoliatum* (L.) Gray

Apiaceae <Thaspium group>: *Thaspium trifoliatum* (atropurpureum)

This southeastern taxon occurs mostly in Appalachian regions. It is generally distinct from *aureum*; see notes under *aureum*. Both taxa occur in thin woods on submesic to subxeric sites.

HAB 7,5,11 C? 3. **ABU** g8 s8 -2.

1826--*Thaspium aureum* (L.) Nutt.

Apiaceae <Thaspium group>: *Thaspium aureum* (*trifoliatum* var. *flavum**)

This occurs mostly west of the highest Appalachian mountains, especially on calcareous sites in midwestern regions. It is reasonable to recognize it as a species distinct from *trifoliatum*, but more research is needed. Appropriate nomenclature remains uncertain (Rafinesque 1836, 4:29-31; Gm, F, K, W, Y). In Ky. *aureum* is clearly more common than *trifoliatum*, but some records need to be checked. As var. *flavum*, F and others have differentiated this taxon based on several characters: larger fruits (ca. 4-5 mm long versus 3-4 mm);

yellow flowers (versus dark purple); larger umbels (usually 3-9 cm wide versus 1.5-3 cm); cauline leaves ternate to quinate (versus simple to ternate) with larger central leaflets (3-8 cm long versus 2-4.5 cm); simple basal leaves larger (3-10 cm long versus 1.5-5 cm); stems taller (3-15 dm versus 2-6 dm) and rarely purplish (versus often); rhizomes thicker (5-15 mm versus 3-5 mm). These plants are often confused with *Zizia aptera*.

HAB 7,5,11 D 3. **ABU** g9 s9 -3.

1827--*Thaspium barbinode* (Michx.) Nutt.

Apiaceae <Thaspium group>: *Thaspium barbinode* (var. b.)

This species, in its narrow sense, occurs mostly in mesic to subxeric woods on base-rich soils from Appalachian regions to the upper midwest. See notes under *chapmannii*.

Plants mapped here include some in drier woods and edges that may appear somewhat transitional to *chapmannii*. In some cases, such plants are relatively tall (up to 1-2 m versus only 0.5-1 m), and fresh flower color is creamy-white (versus sulphur-yellow in typical *barbinode*), but this usually becomes yellowish-brown in dried colls. of both variants. B.E. Wofford & D. Estes (pers. comm.) have grouped these plants provisionally with *chapmannii*, but in Ky. at least they appear closer to typical *barbinode*. *T. barbinode* var. *garmani* Coult. & Rose may be an intermediate; it was described from the Palisades section of the Kentucky Rv. (JESS), but field work here in recent decades has revealed little clear differentiation from typical *barbinode*.

HAB 5,11,7 D 2. **ABU** g9 s9 -3.

1828--*Thaspium chapmanii* (Coult. & Rose) Small ?

Apiaceae <Thaspium group>: *Thaspium* cf. *chapmanii* (*barbinode* var. *angustifolium*; ?b. var. *garmani*)

These rather poorly understood plants are locally abundant in somewhat xeric open areas on calcareous soils in east-central states; mapping here is somewhat tentative. Several authors (F, B, M, W; B.E. Wofford & D. Estes, pers. comm.) have pointed to their distinction from *barbinode*, but D could make no consistent division in Ind. *T. chapmanii* was originally known only from calcareous bluffs in Ala., Ga. and Fla. The supposedly synonymous *barbinode* var. *angustifolium* Coult. & Rose is known from somewhat xeric calcareous woods and glades in Ill., Ind., Ky., Tenn., Va., and perhaps N.C.

T. chapmanii appears intermediate between typical *barbinode* and *pinnatifidum* in the size of its ultimate leaf segments (not counting divisions

cut less than half way to midribs). Compared to barbinode, leaf segments are moderately numerous on larger leaves (ca. 15-75 versus ca. 9-15), mostly 8-15 x 5-10 mm (versus 15-30 x 10-20 mm), usually grayish-granulose green (versus deeper glossy green) and more densely hairy along all veins (versus less hairy to glabrous along smaller veins). Flowers are creamy-white (versus creamy or bright yellow). Mature fruits tend to be smaller (averaging 3-4 mm long versus 4-6 mm). However, there is considerable variation within both taxa.

HAB 12,11? E 4. **ABU** g7 s7 -2.

1829--*Thaspium pinnatifidum* (Buckl.) Gray ?

Apiaceae <Thaspium group>: *Thaspium* cf. *pinnatifidum*

These rather poorly known plants occur locally in thin woods on dry calcareous soils of ne. Ky. and se. Ohio, disjunct from their main range in the Ridge and Valley region of Tenn., N.C. and Ala. Leaf shapes appear to vary between these ranges, and some genetic differentiation may be expected (as in *Solidago harrissii*). The plants in Ky. may be distinct enough to deserve a new name (D. Estes. pers. comm.).

T. pinnatifidum can be distinguished from *chapmannii* and *barbinode* by its relatively deep green (versus yellowish-green) leaves, 3-4-ternate (versus 2-3-ternate), with numerous ultimate pinnatifid segments ca. 5-10 x 1-3 mm in size (versus serrate to lacinate, ca. 8-30 x 5-20 mm). Bractlets are mostly longer (ca. 3-6 mm versus 1-4 mm). Flowers may be white initially (versus pale yellow to pale maroon), but can fade to "yellowish-tan" in older colls. (W). Fruits are usually 3-4 mm long, 2-3 mm wide with relatively narrow wings, and often puberulent (versus 3-6 mm long, up to 4 mm wide with some relatively broad wings, glabrous).

HAB 12,11 E 3. **ABU** g6? s5 -2.

1830--*Foeniculum vulgare* P. Mill. C

Apiaceae <Thaspium group>: *Foeniculum vulgare*

This culinary herb (fennel) is a short-lived perennial from the Mediterranean region that has been widely cultivated. It is locally escaped, especially in southern states. In Ky. there are colls. from MCLE (KY) and PIKE (EKY), but probably just waifs from nearby cultivation.

ALI EU.

1831--*Anethum graveolens* L. C

Apiaceae <Thaspium group>: *Anethum graveolens*

This culinary herb (dill) is an annual from southern Europe that is widely cultivated, and escapes have been reported across much of North America. In Ky. there are colls. from BULL (DHL) and ROWA (MDKY), but it may not be truly naturalized. Other culinary herbs from Europe that are more or less related to *Anethum* are also widely cultivated but with no confirmed records of escapes in Ky. (M): the perennial *Apium graveolens* L. (celery); the biennial *Petroselinum crispum* (Miller) Mansf. (parsley); and the annual *Coriandrum sativum* L. (coriander).

ALI EU.

1832--*Angelica venenosa* (Greenway) Fern.

Apiaceae <Angelica group>: *Angelica venenosa* (villosa)

This occurs in thin woods and brushy openings on dry acid soils, from the Atlantic Coastal Plain to Appalachian regions to sandy regions of the midwest. It has been confused with *triquinata* in some early literature.

HAB 10,7,11 B 4. **ABU** g9 s9 -3.

1833--*Angelica triquinata* Michx.

Apiaceae <Angelica group>: *Angelica triquinata* (curtisii)

This is largely restricted to cooler zones of the central and southern Appalachians, where it occurs in thin mesic woods and openings. In Ky. the records from HARL (KY) and probably LETC (KSNPC) are well-documented. There is a 1939 coll. labelled as from ROWA (MDKY), but the data may be doubted (Campbell et al. 1992). Further west, records are more dubious and may be based on *venenosa*: (1) Short (1840) listed it for "barrens of Ky."; (2) Pr listed it for WARR, but no coll. has been located at MO; (3) a 1950s coll. from ADAI (F) was verified by R. Cranfill (pers. comm.).

HAB 7,5,4,1? C? 3. **ABU** g8 s4 -1?

1834--*Angelica atropurpurea* L.

Apiaceae <Angelica group>: *Angelica atropurpurea*

This occurs mostly in base-rich wetlands of northeastern states and adjacent Canada. It is rare in the central and southern Appalachians (K, W). In Ky. it is known from a discovery by J. Thieret on the Ohio Rv. bottomland in BRAC (KNK) during the 1970s, but he could not relocate the plants in later years. There is also an old report from Short (1840): "borders of Rock-Castle River, and other mountainous situations."

HAB 9,4,1,8? D? 4. **ABU** g9 s1 -6.

1835--*Heracleum maximum* Bartr.

Apiaceae <Angelica group>: *Heracleum maximum* (lanatum*, sphondylium ssp. montanum)

This is widespread on damp fertile soils in northern and western regions of North America, and it is closely related to the Eurasian sphondylium. In Ky. it known from scattered disjunct sites. There are recent colls. from bottomlands along the Ohio River: by R. Gelis from Manchester Islands in LEWI (BEREA; Abbott et al. 2004); and by E. Hartowicz (pers. comm.) from GRNP. There are older records from mesic-subxeric woods on Black Mountain (including Benham Spur), which still need to be verified (M). There are also uncertain western records attributed to CHRI (C.W.Short coll. at PH) and the Cumberland River bottom in TRIG (W.L. Thomas 1968: Univ. of Louisville M.Sc. thesis cited in M). *H. maximum* is known from adjacent Stewart Co. in w. Tenn. (Ch).

HAB 7,10 C? 4? **ABU** g10 s2 -2?

1836--Pastinaca sativa L.

Apiaceae <Angelica group>: *Pastinaca sativa*

This biennial is widely naturalized and locally abundant on damp fertile soils in much of temperate North America; the parsnip is a cultivar selected from the wild type. In Ky. it has probably been common since the mid-1800s or before (Gray 1864; Gm), at least in farmland on the best soils. J. Thieret (pers. comm.) reported that he got skin rashes from handling leaves of wild plants. Although the cultivated parsnip is potentially delicious, some people have a fierce dislike of them (several other taxa in the Angelica group are toxic).

ALI EU. **HAB** R-10,9? ::? E 5. **ABU** +6.

1837--Daucus carota L.

Apiaceae <Daucus group>: *Daucus carota* (ssp. c.)

This biennial is widely naturalized in temperate regions of North America; the carrot is a cultivar (ssp. sativus) selected from the wild type. *D. carota* is often abundant, especially on moderately dry but somewhat fertile soils of occasionally mowed roadsides, old fields and pastures. It has been present in Ky. since the mid-1800s or earlier (Rafinesque 1840; Gm). Rafinesque (1936, 1:31, 4:24-28) expressed uncertainty about its naturalized versus native status in North America, and described several segregates.

D. pusillus Michx. is a native weedy annual that is widely known across southern states, north to Mo., Tenn. (Ch), Va. and perhaps Pa. (*D. scariosus* Raf.). Varied diagnostic characters, inconsistent in some cases, have been used for *pusillus* (Sm, F, Cr, Y, W). It is generally less robust, with smaller

primary umbels (ca. 2-6 cm across versus 6-10 cm) that remain more or less flat-topped in fruit (versus with incurving rays); $2n = 22$ versus 18.

ALI EU. **HAB** F-10,12 ::? D 5. **ABU** +6.

1838--Viburnum rhytidophyllum Hemsl. C

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Tomentosa> *rhytidophyllum*

This Chinese shrub is widely planted, and it rarely spreads from seed in northeastern states. In Ky. a few plants have established from seed in forest adjacent to the lodge at Pine Mt. State Park in BELL (M, Weckman et al. 2002), but it is not clear if these will become a reproducing population.

ALI AS.

1839--Viburnum setigerum Hance C

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Tomentosa> *setigerum*

This Chinese shrub has occasionally escaped from cultivation in northeastern states. In Ky. colls. of self-seeded plants have been made in JEFF and MCRE (Weckman et al. 2002; EKY), but it is not clear if these will become reproducing populations.

ALI AS.

1840--Viburnum lantana L. C

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Lantana> *lantana*

This has been widely planted in northeastern states, and locally naturalized. In Ky. escapes have been collected in CALL (Ind. Univ. SE), FRAN (EKY) and ROWA (MDKY) from isolated waifs or old plantings (Weckman et al. 2002; CW).

ALI EU.

1841--Viburnum lantanoides Michx.

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Pseudotinus> *lantanoides* (alnifolium)

This is a common shrub of northeastern regions and high Appalachian mountains. In Ky. it was recently found by R. Jones at ca. 3400 ft elevation on Black Mt. in HARL (Naczi et al. 2002).

HAB 7,5 B 2. **ABU** g8 s2? -1.

1842--Viburnum cassinoides L.

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Lentago> *cassinoides* (nudum var. c.)

This is a largely Appalachian species. In Ky. it occurs mostly along streams on sandy soils, from rocky banks of larger river to swampy sites along smaller streamheads. It is also found rarely on sandstone clifftops.

HAB 1,6,9,12 B 4. **ABU** g8 s8 -2.

1843--*Viburnum nudum* L.

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Lentago> *nudum* (var. n.)

This southeastern species is verified in Ky. from CALL and GRAV (MUR), but Conrad's (1972) reported coll. from MCLE cannot be located at KY.

There is also a believable report from BARR (KSNPC database). Further east, *nudum* may be expected on the Cumberland Plateau, where it occurs widely in Tenn. (Ch).

HAB 9,6 B 4. **ABU** g8 s3 -2.

1844--*Viburnum lentago* L. R

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Lentago> *lentago*

This northeastern species is widespread across most of Ohio, including counties close to Ky. (PL). There are several reports from Ky., as cited by M and Weckman (2000), but these are generally dubious. A coll. from ROWA (MDKY) may be mislabeled (Campbell et al. 1992).

1845--*Viburnum prunifolium* L.

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Lentago> *prunifolium*

This species of east-central states is often confused with the more southern *rufidulum*. The leaves of *prunifolium* are relatively thin and dull (versus somewhat coriaceous and glossy), glabrous or slightly brown-scurfy below (versus red-scurfy). Also, it tends to spread more from underground runners, sometimes forming thickets. Peak flowering is usually about 2-3 weeks earlier (mid-April versus early May). Both are concentrated on base-rich soils, but *prunifolium* occurs on more mesic sites. Both species are concentrated on base-rich soils, but *prunifolium* occurs on more mesic sites

HAB 8,7,5,4 D 3. **ABU** g10 s9 -3.

1846--*Viburnum rufidulum* Raf.

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Lentago> *rufidulum*

This is a widespread southeastern species. See notes under *prunifolium*.

HAB 12,8,11,7 D 4. **ABU** g9 s9 -3.

1847--*Viburnum opulus* L.

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Opulus> *opulus* (var. *opulus*)

This has been cultivated in northeastern states (often as the "Snowball" cultivar), and it has occasionally escaped. In Ky. colls. from JEFF (EKY; M) and KENT (EKY) appear to be from self-seeded plants, but most other records have less certain status. A coll. from ROWA (MDKY) may be the closely related northern species, *V. trilobum* Marshg. (= *V. opulus* var. *americanum* Ait.), but label data are dubious (Campbell et al. 1992).

ALI EU. **HAB** f-8,10,7? D? 4? **ABU** +4.

1848--*Viburnum sieboldii* Miq.

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Solenotinus> *sieboldii*

This Japanese shrub is widely cultivated in North America and has occasionally escaped, especially in northeastern states (PL). A small reproducing population has been found in MADI (Weckman et al. 2002; EKY). Leaves have an unpleasant "burned rubber" or "rotten green pepper" smell when crushed. The allied species, *V. plicatum* Thunb. ("Japanese Snowball"), is often planted and has escaped locally in some northern and eastern states (PL, W), but it is not yet confirmed in Ky.

ALI AS. **HAB** f-8,10,7? D? 4? **ABU** +4.

1849--*Viburnum acerifolium* L.

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Odontotinus> *acerifolium*

This diploid (2n = 18) shrub of woods on acid soils has a fairly wide eastern range, but it is rare to absent in the lower Ohio and central Mississippi Valleys, including most of w. Ky. and w. Tenn. (PL, Ch). In Ky. colls. from BREA (KY), ESTI (EKY), HARL (KY) and probably elsewhere are referable to var. *glabrescens* Rehd., but that Appalachian variety has not been recognized in most recent treatments (e.g. Cr, W).

HAB 5,11 C 1. **ABU** g9 s9 -2.

1850--*Viburnum molle* Michx.

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Odontotinus> *molle*

This is an uncommon species of mesic calcareous or dolomitic bluffs in Ark., Mo, Iowa, Ill., Ind., sw. Ohio (rare in ravines draining glaciated lands), Ky. (rare on Ordovician cliffs along Kentucky Rv. and Cumberland Rv) and Tenn. (one site along Caney Fk. of Cumberland Rv. in Smith Co). Records from BATH, FLEM, MCRE, PULA and TRIG (B at GH/MO; Wharton 1945; Ellis et al. 1971) have been based on misidentified *dentatum*, *recognitum* or *rafinesquianum*.

Variation in *molle* deserves further attention; $2n$ is reportedly 18 or 36. The Ozarkian plants often spread by runners to form clonal colonies, but in Ky. such behavior is unknown (Y). Those plants have been confused with *V. ozarkense* Ashe (Weckman 2002), to which the name *V. dentatum* var. *deamii* has also been sometimes misapplied. *V. ozarkense* has much affinity with *V. bracteatum* Rehder of s. Tenn, n. Ala. and n. Ga., and may be conspecific (D. Estes, pers. comm.); $2n = 36$ in both.

HAB 5,11 E 2. **ABU** g7 s4 =.

1851--*Viburnum rafinesquianum* J.A. Schultes var. *rafinesquianum*

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Odontotinus> *rafinesquianum* var. r. (hypomaculatum)

This diploid ($2n = 36$) species is fairly widespread in eastern states, but with large disjunctions. Var. *rafinesquianum* has densely pubescent leaves, compared to the relatively glabrous var. *affine*; also, petioles tend to be relatively short (Cr, W). There is little overall difference in range or habitat between the two varieties, but within Ky. both are uncommon and there is little overlap. Var. *rafinesquianum* is widely scattered on rocky slopes of limestone and base-rich shale in or near Appalachian regions. In Tenn., it is known only from a few sites in the Ridge & Valley, and var. *affine* is unknown (Ch; TENN). [A somewhat parallel situation exists in *Lonicera dioica*.]

HAB 12,11,10? D? 3. **ABU** g8? s6 -1.

1852--*Viburnum rafinesquianum* J.A. Schultes var. *affine* (Bush ex Schneid.) House

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Odontotinus> *rafinesquianum* var. *affine*

In Ky. this is locally common on limestone bluffs along the Kentucky River Palisades, and in transitional populations further east. Colls. from ESTI and PULA (KY) mapped here under var. *affine* are somewhat intermediate plants, or in mixed populations with more hairy plants. See notes under var. *rafinesquianum*.

HAB 12,11 E 3. **ABU** g8 s7 =.

1853--*Viburnum dentatum* L. var. *dentatum*

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Odontotinus> *dentatum* var. *dentatum* (pubescens)

This species, broadly defined, includes a polyploid series of plants ($2n = 36, 54, 72$); see also the closely allied *V. recognitum*. Var. *dentatum* may have a

widespread southeastern range, but circumscription and mapping of taxa in this complex needs refinement (Cr, Y, W). Most colls. of the species from Ky. are probably referable to var. *dentatum*, but some from the east appear closer to var. *semitomentosum*, and others (especially from the west) may be referable to var. *deamii*; see notes under those names.

HAB 8,1,12 C 3. **ABU** g9 s8 -2.

1854--*Viburnum dentatum* L. var. *semitomentosum* Michx.

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Odontotinus> *dentatum* var. *semitomentosum* (*V. carolinianum*)

These largely southern Appalachian plants have often been misidentified as var. *venosum* (Britt.) Gleason of the mid-Atlantic Coastal Plain, or as var. *scabrellum* Torr. & Gray of the Gulf Coastal Plain. All three taxa have been revived as species, but with some intergradation; see B.A. Sorrie and Weakley (in W) for details.

Var. *semitomentosum* (as well as *venosum* and *scabrellum*) has stellate-pubescent cymes, and somewhat subcoriaceous, ovate to suborbicular leaves with lower surfaces stellate-pubescent and prominently veined. It typically has relatively large, rounded leaves with 13-18 teeth on each side, densely soft-hairy below and glabrate above (with sparse simple hairs); also, its fruits are pubescent. There has also been confusion with the more western var. *deamii* (Rehd.) Fern., due to inconsistent occurrence of glands on cymes in both taxa.

HAB 9,8? C 4? **ABU** g8 s5 -3?

1855--*Viburnum dentatum* L. var. *deamii* (Rehd.) Fern. T

Adoxaceae [Caprifoliaceae*]: *Viburnum* <Odontotinus> *dentatum* var. *deamii* (?indianense)

This name has been applied to octoploid plants ($2n = 72$) in east-central states from Pa. to Mo., but morphological distinction remains somewhat unclear (D, St, Cr, Y, W). It is reasonable to include the relatively smooth-leaved var. *indianense* (Rehd.) Fern. from Ill., Ind. and Ohio. Several colls. in Ky. appear at least transitional to vars. *deamii* or to *indianense*, but most of these are not clearly distinct: from CART, CASE, CLAR, FLEM, LAUR, MCRE, ROWA and TRIG. Their distribution is similar to var. *dentatum* and they are combined in this Atlas pending further study.

Based on the literature, both *deamii* and *indianense* are usually distinguishable from typical *dentatum* in having stipitate glands on inflorescence branches, petioles and leaf-veins. Like var. *dentatum*, they have

tend to have relatively elongated, thin-textured leaves, which are sometimes only thinly pubescent below (versus more rounded, subcoriaceous and pubescent in vars. semitomentosum, venosum and scabrellum).

1856--*Viburnum recognitum* Fern.

Adoxaceae [Caprifoliaceae*]: *Viburnum* <*Odontotinus*> *recognitum* (*dentatum* var. *lucidum**)

This tetraploid (2n = 36) is native mostly to Atlantic (Me. to S.C.) and Appalachian regions (N.Y. to Ala.), but it has been widely planted in eastern North America. It is closely allied to the more southern *dentatum* complex (especially var. *indianese*), with some apparent transitions, but species status may be warranted (F, Y, W; B.A. Sorrie, pers. comm.). In Ky. colls. (GH, KY) from banks of the Cumberland Rv. and its major tributaries in MCRE and PULA have been misidentified as *molle* (B). These Cumberlandian plants may be transitional to *dentatum* in their relatively large flat suborbicular leaves, the petioles somewhat stellate-pubescent on margins and stipulate (suggesting var. *indianense*). There is a similar coll. from se. Ohio (GH: Scioto Co., banks of Turkey Creek), and colls. with thinly pubescent petioles are also known from e. Tenn. (GH: Coffee, Cumberland & Morgan Cos.).

Based largely on above literature, flowering of *recognitum* occurs about two weeks later than *dentatum*. Its inflorescence branches are usually glabrous and only sometimes glandular (versus consistently hairy and glandular). Seeds are less deeply grooved; F stated "shallow and broad trough-like furrows" (versus "narrow, deep and furrow-like"). Leaves are largely glabrous (versus uniformly hairy), usually ovate (versus ovate to rotund) and plicate (versus generally flat). *V. recognitum* usually occurs on relatively damp sites along or near banks of larger streams.

HAB 1,10 C 4. **ABU** g9 s7 -1.

1857--*Sambucus canadensis* L. var. *canadensis*

Adoxaceae [Caprifoliaceae*]: *Sambucus canadensis* var. *c.* (*nigra* ssp. *c.*)

This is widespread across North America, except the northwest. It has been combined by some authors as a subspecies with the European *S. nigra* L.

HAB 9,8,7,6 D 4. **ABU** g10 s10 -3.

1858--*Sambucus canadensis* L. var. *submollis* Rehd.

Adoxaceae [Caprifoliaceae*]: *Sambucus canadensis* var. *submollis*

This densely pubescent variety has a somewhat southwestern range centered on the Ozark region (F, Cr), but its distinction has been doubted (Y). In Ky.

the few records are from swampy areas that may occasionally dry out in summer-fall.

HAB 9,2? D? 4? **ABU** g7? s4? -3.

1859--*Sambucus pubens* Michx.

Adoxaceae [Caprifoliaceae*]: *Sambucus pubens* (*racemosa** var. *p.*)

This is the Appalachian segregate of a widespread circumboreal species-complex: *S. racemosa* L., sensu lato. Within the southern Appalachians, it is occurs mostly in or near the Blue Ridge, but there are also small disjunct populations on the Appalachian Plateaus from Tenn. to Ohio (PL). In Ky. the only verified records are from HARL (EKY) and MENI (KY). Reports of Linney (1880, 1882) and to Gm from several other counties remain dubious.

HAB 5,7,8 B 3. **ABU** g10 s2 -2?

1860--*Diervilla lonicera* P. Mill. R

Diervillaceae [Caprifoliaceae]: *Diervilla lonicera* (trifida)

Gray (1884) included Ky. in the range of this northeastern shrub, but other editions of his manuals did not, and no colls. from Ky. have been located. Yet *D. lonicera* is known from within ca. 30-50 miles of the state line in Ind., Ohio, W.Va., Va. and Tenn. (K, PL), and it can be expected in Ky. The related East Asian species, *Weigelia floribunda* (Sieb. & Zucc.) K. Koch, is commonly cultivated but not known to escape.

1861--*Lonicera standishii* Jacques

Caprifoliaceae: *Lonicera* <*Chamaecerasus*> *standishii*

There are few reports of this Chinese shrub naturalizing elsewhere in North America (K, PL, W). But in Ky. it has become locally abundant along the Palisades of the Kentucky River, where it may have been planted a few decades ago by one or more landowners. The earliest record from Ky. was a coll. of E. Guharhja in 1961 from BOUR.

In addition to the curious pairs of fused fruits in *standishii*, and other differences in regular colls., a distinguishing character of vegetative material is the long bristly hairs on young shoots. W.H. Duncan's unpublished work includes a full description (Univ. of Ga., Athens). The species seems to spread vegetatively by layering or underground shoots, making control difficult. An artificial hybrid with *fragrantissima* (= *X purpusi* Rehd.) has also been found to escape in Mo. (Y).

ALI AS. **HAB** f-11,5 E 3. **ABU** +4*.

1862--*Lonicera fragrantissima* Lindl. & Paxton C

Caprifoliaceae: *Lonicera* <*Chamaecerasus*> *fragrantissima*

This Chinese species has reportedly become common as a persistent planting or local escape in more southeastern states (W). In Ky. it has been collected from self-seeded plants in FAYE (CW) and JEFF (MM for WKY), but it does not appear to be spreading significantly over the landscape.

ALI AS.

1863--*Lonicera morrowi* Gray group

Caprifoliaceae: *Lonicera* <*Chamaecerasus*> *morrowii-tatarica-xylosteum* group (+ hybrids)

L. morrowii Gray (from East Asia), *L. tartarica* L. (from Central Asia), and *L. xylosteum* L. (from Europe) are closely related species that have been widely cultivated and interbred. These shrubs have become naturalized in northeastern states and adjacent Canada (Cr, K, PL, W), especially *tatarica* (with white and pink-flowered forms). In Ky, the earliest records date from the 1960s.

Various species or hybrids have been reported in this complex, but their distinction is often uncertain and colls. deserve more study to justify separate mapping; see also Y. Most colls. from Ky. may be referable to *morrowii* x *tatarica* (= X *bella* Zabel) or to *morrowii*; only a few accessed colls. have been named *tatarica* (e.g. FAYE and WOOD at KY). In addition, Clark et al. (2005; CW) have recently reported *xylosteum* from LAUR (EKY), LYON and OLDH (CW); *tatarica* x *xylosteum* (= X *xylosteoides* Tausch) from JEFF (CW); and the complex hybrid X *minutiflora* Zabel (involving all three species) from ROCK (CW) and WOOD (EKY).

ALI AS. HAB f-8? D? 3. **ABU** +4.

1864--*Lonicera maackii* (Rupr.) Herder

Caprifoliaceae: *Lonicera* <*Chamaecerasus*> *maackii*

This large shrub from northeast Asia has become highly invasive in several regions of east-central states, especially on base-rich soils. It was initially attractive to the nursery industry, and was also promoted by the USDA from the 1960s into the 1980s (Luken & Thieret 1996). In Ky. it appears to have been first planted during the 1950s, and it began to spread widely after 1970. *L. maackii* is now much more widespread than colls. indicate.

ALI AS. HAB f-8,7,11,4 E 3. **ABU** +6*.

1865--*Lonicera japonica* Thunb. var. *japonica*

Caprifoliaceae: *Lonicera* <*Chamaecerasus*> *japonica* var. *j.*

This was introduced to eastern states as a fragrant ornamental during the mid-1800s or before (Gray 1864). In 1914, Gm noted: "common about old premises in Kentucky where it has at times been observed to assume the character of a weed." It is now one of the most abundant shrubby vines across the state. Unfortunately, most of the colls. at KY were mislaid in the 1990s.

ALI AS. HAB f-8,7,11,5 C 4. **ABU** +6*.

1866--*Lonicera japonica* Thunb. var. *chinensis* (P.W. Wats.) Baker

Caprifoliaceae: *Lonicera* <*Chamaecerasus*> *japonica* var. *chinensis*

This relatively smooth, purplish variety may be somewhat distinct, but the taxonomy and distribution need to be checked.

ALI AS. HAB f-8,7,11,5 C? 4. **ABU** +4.

1867--*Lonicera sempervirens* L.

Caprifoliaceae: *Lonicera* <*Periclymenum*> *sempervirens*

Although often cultivated, this largely southeastern vine does not seem to escape in general. It is known mostly from regions with acid soils and an ancient history of woodland disturbance that produces the thickets where it thrives. Most colls. at KY were mislaid in the 1990s.

HAB 8,10,12 C 4. **ABU** g10 s8 -3.

1868--*Lonicera sempervirens* L. [yellow flowered form]

Caprifoliaceae: *Lonicera* <*Periclymenum*> *sempervirens* {yellow form}

The flowers of these plants differ from typical *sempervirens* in their orange-yellow color and their slightly irregular shape, with one lobe longer pointed. They have sometimes been confused with *flava*. It is possible that they deserve taxonomic recognition, but further analysis is needed. These plants have been widely cultivated in eastern states.

HAB 8,12? D? 4. **ABU** g7? s3? -3.

1869--*Lonicera flava* Sims R

Caprifoliaceae: *Lonicera* <*Periclymenum*> *flava* (*flavida*)

This Ozarkian and southern Appalachian species has been reported from Ky. by Pr (listed for WARR), Linney (1882) and other authors (M). But no colls. have been located, and Duncan (1967) mapped only *dioica* in WARR. *L. flava* has also been reported from counties of n. Tenn., s. Ill., s. Ohio that are adjacent or near to Ky. (K, PL).

There has been some general confusion between *flava* and *dioica* in east-central states; e.g. see apparent replacement of most *flava* by "*dioica*" in Ark. (K). Hybrids have been suspected in some cases (Cr), especially among plants known as *L. flava* var. *flavescens* Gleason (Sm, Gl) or *L. flavida* Cockerell (F), to which some Ky. records refer. There has also been confusion with the yellow-flowered form of *sempervirens*. *L. flava* is best distinguished from *dioica* by its bright-yellow to orange corollas (versus white, lemon or pinkish), which are not pouched near the base; also, leaves are less glaucous below (Y).

1870--*Lonicera dioica* L. var. *dioica*

Caprifoliaceae: *Lonicera* <*Periclymenum*> *dioica* var. *d.*

This low sprawling shrub occurs in diverse habitats across its broad northern range, including wetlands (F, Cr, W). In Ky. it occurs mostly in mesic to subxeric calcareous woods along the central Kentucky Rv. Palisades or nearby, and more locally in hills along the upper Cumberland Rv. Reported colls. from BUTL (CW) and WARR (Duncan 1967) have not yet been located and verified; see also notes under *flava*. Some colls. at Ky. have been mislaid since the 1990s, but most were referable to var. *dioica*, which is relatively glabrous and has a largely northeastern range.

HAB 11,5 + D 3. **ABU** g8 s7 -1.

1871--*Lonicera dioica* L. var. *glaucescens* (Rydb.) Butters

Caprifoliaceae: *Lonicera* <*Periclymenum*> *dioica* var. *glaucescens* (*orientalis*, *dasygyna*)

Varieties of *dioica* may not be clearcut (Y), but they are reported from diverse habitats, and their ranges are somewhat segregated or fragmented in southeastern states (Gl, Cr, W). The following three taxa are provisionally combined here. [A somewhat parallel situation exists within *Viburnum rafinesquianum*.]

Var. *glaucescens*, sensu stricto, is a largely northwestern taxon that is generally more pubescent than var. *dioica* in leaves and flowers.

Var. *orientalis* Gleason is a similar eastern taxon, with generally hairy leaves plus glandular hypanthia; its type is from CART (NY) and there are other Ky. colls. from PULA, ?JESS and ?WAYN.

Var. *dasygyna* (Rehd.) Gleason is similar to *orientalis*, but with dense long hairs on hypanthia as well as glands; it may be known only from Ind. and Ohio, plus a recent report from CART in Ky. (CW).

HAB 11,5 + D 3. **ABU** g7? s4 -1.

1872--*Lonicera prolifera* (Kirchn.) Rehd.

Caprifoliaceae: *Lonicera* <*Periclymenum*> *prolifera* (*sullivantii*, ?*reticulata**)
In Ky. this midwestern species is rare on more or less xeric limestone cliffs along tributaries of the lower Kentucky Rv. (and formerly up Elkhorn Cr. into FAYE), plus a few calcareous sites in the southern and western Knobs. Colls. to support the records from HARD (Cranfill 1991) and JEFF (Duncan 1967) have not yet been located. There is almost no distributional overlap in Ky. with the closely related *dioica*, which occurs more widely on calcareous outcrops, from xeric to mesic sites. But further west and north, *prolifera* does overlap geographically and occurs in a much wider range of habitats (e.g. Y).

Plants of *prolifera* along the Kentucky Rv. Palisades all have virtually glabrous leaves, and tend to form compact low bushy mounds 1-2 m high, in marked contrast with those further north that can climb to 5 m or more. Distinction from *dioica* can be difficult, even with flowers (F, GC, Y). Leaves are generally broader and blunter in shape (l/w = 1-1.5 versus 1.2-2.2 in upper ones); the uppermost connate pair is often suborbicular and covered by glaucous bloom near the center (versus virtually all green). Flowers are creamy or pale yellow, never pinkish (as sometimes in *dioica*), and they occur in (2) 3-4 (6) whorls (versus usually 1-2).

Some authors in recent years have applied the name *L. reticulata* Raf. to this species, based on an unpublished dissertation (Perino 1978; cited by Y). However, Rafinesque's (1836, 3:17-18) description of *reticulata* suggests *dioica*; it is his *rupestris* that suggests *prolifera*.

HAB 12,11 + E 4. **ABU** g8 s4 =.

1873--*Symphoricarpos orbiculatus* Moench

Caprifoliaceae: *Symphoricarpos orbiculatus*

This small shrub is a diploid (2n = 18) that is widespread in eastern and central states, especially on dry base-rich soils. In Ky. it is especially common in thin woods and brushy old fields that have a history of browsing by livestock.

HAB f-8,7,11 D 4. **ABU** g10 s10 -2?

1874--*Symphoricarpos occidentalis* Hook. R

Caprifoliaceae: *Symphoricarpos occidentalis*

This largely northwestern tetraploid (2n = 36) is unlikely in Ky. There may be a coll. from ROWA (MDKY), but the label data are dubious (Campbell et al. 1992).

1875--Symphoricarpos albus (L.) Blake

Caprifoliaceae: *Symphoricarpos albus* (var. a.)

This is a widespread variable western and northern species; 2n = 36 and 54. In Ky. it occurs on several narrow limestone ridges in the eastern Knobs, together with other rare or disjunct species (e.g. *Calamagrostis insperata*). These populations are completely disjunct from the species' extension down the Ridge-and-Valley region to w. Va., and those in the Great Lakes region (PL, W).

Var. *laevigatus* (Fern.) Blake of Pacific regions is widely cultivated, but is not known to have escaped in Ky. It has much larger fruit (ca. 12-20 mm versus 6-10 mm), less hairy leaves, and larger potential size (ca. 0.8-3 m versus 0.1-1 m tall).

HAB 12 E 4. **ABU** g10 s3 =.

1876--Triosteum perfoliatum L.

Caprifoliaceae: *Triosteum perfoliatum* (var. p.)

This is reportedly widespread across most of eastern North America, but most common from midwestern regions to Ohio and Pa. and uncommon or rare in southeastern states (PL, W). It is poorly known in Ky. There has been confusion with *aurantiacum*, and some records need to be rechecked, but hybrids have not been documented here or elsewhere (Y).

HAB 8,7? D? 4? **ABU** g9 s5 -4?

1877--Triosteum aurantiacum Bickn.

Caprifoliaceae: *Triosteum aurantiacum* (*perfoliatum* var. a.)

In Ky. this widespread northeastern species is generally restricted to subxeric woods and thickets on limestone, and it is relatively frequent along the Kentucky River Palisades. Variation deserves further study (Cr, Y). Colls. from BELL (BEREA), ESTI (KY) and EDMO (NCU) are referable to the relatively eastern var. *glaucescens* Wieg., which has glabrous leaves. Colls. from ANDE (KY), CRIT (MUR) and MERC (KY) are referable to the relatively western var. *illinoense* (Wieg.) Palmer & Steyermark, which has longer hairs. The only variety in Mo. is *illinoense* (Y).

HAB 11,7,8? E 3. **ABU** g9 s8 -3.

1878--Triosteum angustifolium L.

Caprifoliaceae: *Triosteum angustifolium*

In Ky. this widespread southeastern species occurs in various habitats, but usually in or near calcareous woods. Colls. from HICK (MUR), PEND and PULA (KY) are referable to var. *eamesii* Wieg., which has more pubescent leaves. That segregate has not been recognized in some recent treatments (e.g. Y), but it may be

HAB 7,11,8? D 3? **ABU** g9 s8 -3.

1879--Valeriana pauciflora Michx.

Valerianaceae: *Valeriana pauciflora*

This remarkable rhizomatous plant occurs in east-central states from s. Pa. and Va. to s. Ill. and Mo., but it is absent from most of the Appalachian region. It is largely restricted to relatively undisturbed woods on moist fertile soil along stream terraces.

HAB 5,4 E 1. **ABU** g7 s7 -4.

1880--Valerianella locusta (L.) Lat.

Valerianaceae: *Valerianella locusta* (*olitoria*)

This is a widely naturalized weedy annual in temperate regions of North America.

ALI EU. **HAB** H-10,9 ::? D 6. **ABU** +5.

1881--Valerianella radiata (L.) Dufr.

Valerianaceae: *Valerianella radiata* (var. r.)

This is a widespread southeastern species, occurring in a broad range of habitats from floodplains to rocky glades. Variation deserves further study. Some colls. with hairy fruits have been named *V. stenocarpa* (Engelm. ex Gray) Krok in error. There has also been much confusion with other species in the genus.

HAB f-4,7,10 ::? D 3. **ABU** g9 s9 -2?

1882--Valerianella umblicata (Sullivant) Wood

Valerianaceae: *Valerianella umblicata* (*intermedia*, *patellaria*; *radiata* var. i.)

This largely northeastern species has been confused with *radiata*, and colls. need to be rechecked. *V. umblicata* differs in its largely eciliate bracts, usually larger corollas (ca. 3-5 mm long versus 1.5-2 mm, with lobes 1-2 mm versus 0.4-0.8 mm), and often less elongated (suborbicular) fruit (F, Cr).

Previously segregated species are now combined as no more than forms, since they were based on genetic fruit polymorphisms (Ware 1983). Using F, most colls. in Ky. were formerly referable to *V. intermedia* Dyal, and some

colls. from CLAR, JEFF and WOOD (KY) were referable to *V. patellaria* (Sulliv.) Wood. No clear local differences in ecology have been described between any of these taxa, including radiata.

HAB f-10,9,7,6 ::? E 4? **ABU** g8 s8 -3?

1883--Valerianella chenopodiifolia (Pursh) DC. R

Valerianaceae: *Valerianella chenopodiifolia*

This may be largely restricted to the southern Great Lakes region (PL), but it has received varied taxonomic treatments and mappings (e.g. compare D for Ind. with Co for Ohio). In Ky. the name has been applied to colls. from FAYE, JESS, MADI and MERC (EKY, KY), but further revision is needed to see if these plants are just forms of *umblicata*. *V. chenopodiifolia* has distinct fruits with relatively wide fertile locules (Ware 1982; Cr, W), and like *umblicata* it differs from *radiata* in its relatively eciliate bracts and larger flowers (F).

1884--Dipsacus fullonum L.

Dipsacaceae: *Dipsacus fullonum* (*sylvestris*)

This biennial weed is the common wild "teasel", with straight chaff, that is widely naturalized in humid, mid-temperate regions of North America. It was probably present in Ky. early after settlement (Rafinesque 1836), but Gray's (1864) note was "rather rare" in northeastern states. In 1914, Gm just noted "not so often seen in cultivated ground." It is now locally abundant in the state, especially along major roads on more fertile soils, as in the Bluegrass region.

The name *fullonum* has also been misapplied to *D. sativus* (L.) Honckeny, with hooked chaff, which was traditionally selected in Europe for use with textiles but has not been confirmed as naturalized in east-central states (F, Cr, W).

ALI EU. **HAB** R-10,12 ::? D 6. **ABU** +6.

1885--Dipsacus laciniatus L.

Dipsacaceae: *Dipsacus laciniatus*

This weed has invaded east-central states during recent decades, centered slightly to the north of *fullonum*. It was first reported in Ky. during the 1970s (M), and it is spreading, especially along major highways; see also Y. Hybrids with *fullonum* have been reported elsewhere (Cr), but not observed in Ky.; $2n = 16$ and 18 in both species.

ALI EU. **HAB** R-10 ::? D 6. **ABU** +5.

1886--Campanula divaricata Michx.

Campanulaceae: *Campanula divaricata*

This caespitose perennial diploid ($2n = 34$) is restricted to the central and southern Appalachians, usually growing in crevices of moist to dry shaded sandstone cliffs and boulders.

HAB 5,11 || B 3. **ABU** g8 s7 =.

1887--Campanula rapunculoides L. W

Campanulaceae: *Campanula rapunculoides*

This rhizomatous polyploid ($2n = 102$) is a weed that is locally naturalized in northeastern regions, especially in mowed areas, but remains rare to absent in southeastern states (PL, W). In Ky. it is known only from 1978 colls. by R. Cranfill and M. Grayum on the Univ. of Ky. campus (FAYE).

ALI EU.

1888--Campanula aparinoides Pursh

Campanulaceae: *Campanula aparinoides* (var. a.)

This variable species ($2n = 34, 68, 170$) is a reclining rhizomatous plant typical of wet meadows and fens in northeastern regions. There are several records from counties that are adjacent or close to Ky. in ne. Tenn., Va., W.Va. and Ohio. In Ky. it is known from colls. at MDKY that were verified for BT, but then transferred to the herbarium of Clyde Reed (now at MO). There are several older reports, which may be based on colls. (e.g. F). It may have been much reduced by farming and other developments.

HAB 9 ::? D? 5? **ABU** g10 s4 -5?

1889--Campanulastrum americanum (L.) Small

Campanulaceae: *Campanulastrum* [*Campanula*] *americanum*

Recognition of this monotypic genus remains controversial (W); $2n = 58$ (versus 34, 68, 102, etc. in *Campanula*). It is a widespread winter-annual (or biennial) across eastern states, except New England, but locally much reduced due to browsing by deer or livestock. In c. Ky. it has been called "Shawnee Salad" due to human use for edible greens (R. Houp of Wilmore in JESS, pers. comm.). A coll. from BOUR (KY) is referable (within *Campanula*) to the western var. *illinoensis* (Fresen.) Farw., which may deserve further taxonomic attention.

HAB 7,8,11 ::? D 4. **ABU** g10 s10 -1?

1890--Triodanis perfoliata (L.) Nieuwl.

Campanulaceae: *Triodanis* [Specularia] *perfoliata* (var. p.*)

This annual is widespread across North and Central America. It is usually distinct from the more cleistogamous *biflora*, but fertile hybrids have been documented in other states (as reviewed by Y).

HAB f-10,12 ::: D 6? **ABU** g10 s10 +1?

1891--*Triodanis biflora* (Ruiz & Pavón) Greene

Campanulaceae: *Triodanis* [Specularia] *biflora* (*perfoliata* var. b.*)

This is largely restricted to warmer American regions, and is virtually unknown in glaciated regions north of Ky. (PL). It tends to occur in drier rockier sites than *perfoliata*, on average; see notes under *perfoliata*.

HAB f-12,10 ::+ C 4. **ABU** g10 s8 +1?

1892--*Triodanis leptocarpa* (Nutt.) Nieuwl. R

Campanulaceae: *Triodanis* [Specularia] *leptocarpa* (?*scabra*)

This is a species of the Great Plains that extends east into e. Mo., c. Ill. and Ind., but it is perhaps only adventive along rights-of-way within more eastern states (D, Y). For Ky. there is only an obscure reference to *T. scabra* Raf. by Rafinesque (1836, 4:67): "Found by me 1823 in the glades near the mouth of the Tennessee R[iver]." *T. scabra* is considered to be a synonym of *leptocarpa*, according to Merrill (1949).

1893--*Lobelia cardinalis* L.

Campanulaceae: *Lobelia cardinalis*

This favorite flower of humming-birds is widespread in North America (except the northwest), Central and South America. Named subspecies and varieties are not generally considered distinct in recent treatments (as reviewed by Y). In Ky. the white-flowered form has been recorded in MCRE (Rogers 1941). Sterile hybrids with *siphilitica* have been rarely found in other states (Y); $2n = 14$ in both species (as in most *Lobelias*).

HAB 6,9,2,1 C 3. **ABU** g10 s10 -3.

1894--*Lobelia siphilitica* L.

Campanulaceae: *Lobelia siphilitica*

This is a widespread perennial (often short-lived or even biennial) in eastern and central North America. It has been divided into eastern (typical) and western varieties. The latter (var. *ludoviciana* DC.) is indistinct in Mo. (Y), but it might be looked for in w. Ky. The white-flowered form has been found in FAYE (C. Chandler, pers. comm.) and WOOD (E. Carr, pers. comm.).

HAB f-9,1,10 :: D 4. **ABU** g10 s10 -2.

1895--*Lobelia puberula* Michx.

Campanulaceae: *Lobelia puberula*

This widespread perennial of southeastern states is "highly variable, and represented by a number of forms" (B), but these may not be worth recognizing (Y). Virtually all colls. of this species in Ky. are referable to var. *simulans* Fern. Colls. from HICK and perhaps CARL (MUR) are referable to var. *mineolana* F. Wimmer. Typical var. *puberula* occurs on the eastern Coastal Plain and Piedmont, and is unknown in Ky. The more southern species, *L. georgiana* McVaugh (= *L. amoena* Michx. var. *glandulifera* Gray), has been reported from Ky. (B, F) but apparently based on misidentified *puberula* (M).

HAB f-10,9,12,7 B 5. **ABU** g9 s9 -3.

1896--*Lobelia spicata* Lam. var. *spicata*

Campanulaceae: *Lobelia spicata* var. *spicata* (*originalis*, ?*campanulata*)

This variable perennial occurs across much of eastern and central North America, and several segregates have been described. Distinction of var. *leptostachys* remains somewhat uncertain; see D.J. Bogler (in Y) for a detailed key. Var. *leptostachys* is known mostly from calcareous regions of east-central states (PL), and has been considered typical of drier sites than var. *spicata* (F, Cr). However, no clearcut differences in distribution or habitat have been noted in Ky., Tenn. (Ch), Mo. (Y) or further east (W).

Other potential variants need assessment. A coll. from POWE (DHL) may be referable to the northern var. *campanulata* McVaugh, and B reported var. *originalis* McVaugh from several counties, but Bogler has included both taxa within var. *spicata*. F also reported the southeastern var. *scaposa* McVaugh from Ky., but colls. have not been located.

HAB 10,12? ::? D 5. **ABU** g9 s8 -3.

1897--*Lobelia spicata* Lam. var. *leptostachys* (A. DC.) Mackenzie & Bush

Campanulaceae: *Lobelia spicata* var. *leptostachys*

Mapping here is provisional; see notes under var. *spicata*.

HAB 12,10 + D 5. **ABU** g9 s8 -2.

1898--*Lobelia gattereri* Gray

Campanulaceae: *Lobelia gattereri* (*appendiculata* var. *g.*)

This perennial is endemic to the limestone glades of c. Tenn, n. Ala and s. Ky. In Ky. the only record is from the Woodburn Glade of northern SIMP: M. Evans #8205 (KSNPC; accession unknown).
HAB 12 E 4. **ABU** g6 s2 -5.

1899--Lobelia nuttallii J.A. Schultes

Campanulaceae: *Lobelia nuttallii*

This southeastern perennial is a variable species (2n = 14, 28) that occurs mostly of the Coastal Plain, but with disjunct populations inland as far as the Cumberland Plateau. In Ky. it is restricted to a few boggy (hydroxeric) sites on acid soils.

HAB 9 B 5. **ABU** g9 s4 -4.

1900--Lobelia inflata L.

Campanulaceae: *Lobelia inflata*

This annual is widespread in eastern North America (except La. and Tex.). In Ky. it is especially frequent along trails and rough roads through woods.

HAB f-10,7,11 ::: C 3. **ABU** g10 s10 -1?

1901--Nymphoides peltata (Gmel.) Kuntze

Menyanthaceae: *Nymphoides peltata*

This floating aquatic is often sold for water gardens, and it may be increasing in southeastern states (W). In Ky. it is known only from the lake at Bernheim Forest (BULL; MM for WKY). It has also been collected in Montgomery and Stewart Cos., Tenn., close to TRIG (APSU).

ALI EU. **HAB** 2 ~ C? 5. **ABU** +4.

1902--Bradburia pilosa (Nutt.) Semple

Asteraceae <Astereae>: *Bradburia* [*Chrysopsis**] *pilosa*

This annual occurs mostly from Mo. and Kans. to La. and Tex. East of the Mississippi it is rare and often presumed to be adventive (W), but it is known from a few remnants of native grassland in Tenn. (Ch; D. Estes, pers. comm.). There are only two Ky. colls., but both from the historical "Big Barrens" region: (1) G.P. Johnson #1055 (WKU), 15 Sep 1979; EDMO-BARR Co. line on US31W, cedar glade; (2) C. Williams to R. Seymour (JC for EKY), 28 Aug 2011, HART, roadside north of Munfordville.

ALI w. **HAB** r-12,10? ::? C? 4? **ABU** g8? s2? -2?

1903--Chrysopsis mariana (L.) Ell.

Asteraceae <Astereae>: *Chrysopsis mariana*

This occurs widely in southeastern states, usually growing in thin woods and brushy openings on dry acid soils.

HAB 8,11,10 B 4. **ABU** g9 s8 -2.

1904--Pityopsis graminifolia (Michx.) Nutt. var. latifolia (Fern.) Semple & Bowers

Asteraceae <Astereae>: *Pityopsis* [*Chrysopsis*] *graminifolia** var. *latifolia* (*nervosa*)

Typical var. *graminifolia* is largely restricted to the Coastal Plain, while var. *latifolia* has a more widespread southern range (Cr, FNA 20).

HAB 12,10 + B 4. **ABU** g9 s8 -1.

1905--Heterotheca camporum (Greene) Shinnery var. glandulissimum Semple

Asteraceae <Astereae>: *Heterotheca* [*Chrysopsis*] *camporum** var. *glandulissimum*

Varieties may need checking in some cases. Before 1930 var. *glandulissimum* was largely restricted to rocky bluffs and streambanks in the Nashville Basin of c. Tenn., but it began spreading across east-central states, especially along interstate highways (Semple 1983; FNA 21; W). The earliest record in Ky. was a coll. of B from MONR.

Var. *camporum* is a much less weedy plant of rocky glades and prairies in n. Ark., e. Mo., Ill. and w. Ind. It is unknown in Ky., although the holotype is a coll. of C.W. Short (Univ. of Notre Dame) without clear provenance (M), and there may be a coll. from MCRA (MUR). There has also been confusion with *H. villosa* (Pursh) Shinnery, with some authors using the combination *H. villosa* var. *camporum* (Greene) Wunderlin; typical *villosa* is a distinct western taxon that is unknown in Ky. (FNA 20).

ALI s. **HAB** R-10 C 5. **ABU** +5*.

1906--Heterotheca latifolia Buckley

Asteraceae <Astereae>: *Heterotheca* [*Chrysopsis*] *latifolia* (*subaxillaris* ssp. l.) Although often recognized in floras, at least as a subspecies (e.g. FNA 20), some studies indicate that this widespread southwestern taxon is not clearly distinct from typical *H. subaxillaris* (Lam.) Britton & Rusby of the southeastern Coastal Plain (especially ocean dunes); see citations of Y and W. In Ky., most records are from dune-like sandy areas along the lower Ohio Rv. and the Mississippi Rv., or nearby. The coll. from JEFF (KY) is from a waif found in the parking lot by the herbarium in 1996.

HAB 1,9,10 C 5. **ABU** g10 s4 -1.

1907--*Grindelia squarrosa* (Pursh) Dunal

Asteraceae <Astereae>: *Grindelia squarrosa*

This western species appears to be only adventive in eastern states.

ALI W. **HAB** R-10,12 C? 5. **ABU** +4.

1908--*Grindelia lanceolata* Nutt.

Asteraceae <Astereae>: *Grindelia lanceolata*

This largely southwestern species is considered native at scattered sites in the Interior Low Plateaus. Ky. records are mostly from weedy situations but in or near former glades and barrens.

HAB r-12,10 D? 5. **ABU** g8 s4? -2?

1909--*Solidago caesia* L.

Asteraceae <Astereae>: *Solidago* <Glomeruliflorae> *caesia* (var. ca.)

This diploid ($2n = 18$) of mesic to suberic woods is widespread across eastern North America. In Appalachian regions there is sometimes confusion with *curtisii*, and occasional intermediates appear to exist. Also, a few scattered colls (e.g. from FLOY, HICK, HARL; EKY) may be simple hybrids or introgressants with *flexicaulis*. The southern var. *zedia* R.E. Cook & Semple probably does not occur as far north as Ky. (FNA 20; Y), but it may resemble broad-leaved plants of *caesia* or hybrids of *caesia* with *flexicaulis*.

HAB 5,11 C 2. **ABU** g10 s10 -2.

1910--*Solidago curtisii* Torr. & Gray

Asteraceae <Astereae>: *Solidago* <Glomeruliflorae> *curtisii* (*caesia* var. cu.)

This Appalachian species occurs mostly at higher elevation. It appears generally distinct from typical *caesia*, with little or no intergradation, but these closely related taxa are often confused. Typical plants are diploids ($2n = 18$); robust plants may be polyploids that are confused or hybridized with *flaccidifolia* (or even *flexicaulis*). Harvill (1941) reported var. *pubens* (M.A. Curtis) Gray from HARL (coll. burned at KY); this is a relatively hairy, broader-leaved variant that may be transitional to *flaccidifolia*, and is verified only in the Blue Ridge of Va. and N.C. (FNA 20).

HAB 5 C 2. **ABU** g9 s5 =.

1911--*Solidago flaccidifolia* Small

Asteraceae <Astereae>: *Solidago* <Glomeruliflorae> *flaccidifolia*

This southern Appalachian taxon is locally frequent in the Big South Fork corridor (MCRE), and there are scattered records elsewhere in southeastern counties. Further comparison with *flexicaulis* is needed to clarify the status of some plants. *S. flaccidifolia* is a polyploid ($2n = ?36, 54$) that appears generally intermediate between *flexicaulis* and *curtisii*, and possibly of hybrid origin. Some outlying records may be confused with forms of those two species, especially robust plants of *curtisii* and the "Appalachian variant" of *flexicaulis*.

HAB 5,4? C 2. **ABU** g7? s5? -1.

1912--*Solidago flexicaulis* L. var. nov.

Asteraceae <Astereae>: *Solidago* <Glomeruliflorae> *flexicaulis* var. nov.

In Ky. this variant was first suggested (in print) by B. Based on study at several herbaria, these plants occur widely in Appalachian regions, at least between N.Y. and N.C. Compared to typical *flexicaulis*, they have more tapered leaf bases, generally less hairy foliage, and often more extended terminal inflorescences. They have often been confused with *flaccidifolia*. Based on material at WAT, most or all plants are tetraploid ($2n = 36$), as in typical *flexicaulis* across east-central states. Plants mostly occur on slopes with medium acid soils in woods with beech and tulip poplar. The types of *flexicaulis*, *latifolia* and others need to be reviewed in order to determine correct names.

HAB 5 C 1. **ABU** g8? s8? -1.

1913--*Solidago flexicaulis* L. var. flexicaulis

Asteraceae <Astereae>: *Solidago* <Glomeruliflorae> *flexicaulis* var. f.

S. flexicaulis is a widespread species in eastern North America, but rare to absent on the southeastern Coastal Plain. In Ky. typical *flexicaulis* mostly occurs on toe slopes and terraces with more base-rich soils, often with trees such as sugar maple and white ash. Plants mapped here may largely correspond to the widespread tetraploid race of *flexicaulis* (Chmielewski & Semple 1985; Cr, FNA 20; Cook & Semple 2008). Diploids occur mostly in northeastern regions, but are known from e. Ky. They appear difficult or impossible to distinguish from tetraploids, based on study of material at Univ. of Waterloo (WAT). A similar cytogeographic pattern occurs in *Helianthus decapetalus*.

HAB 5,4 D 1. **ABU** g10 s10 -3.

1914--*Solidago albopilosa* E.L. Braun

Asteraceae <Astereae>: *Solidago* <Glomeruliflorae> *albopilosa*

This species is endemic to Ky., where it is known only from 80-90 sites under sandstone cliffs in the Red Rv. Gorge (White & Drozda 2006). Some populations have been eliminated by excessive recreational disturbance. *S. albopilosa* is a tetraploid that probably diverged from typical flexicaulis; $2n = 36$ in both species.

HAB 5 // C 2. **ABU** g4 s4 =.

1915--*Solidago erecta* Pursh

Asteraceae <Astereae>: *Solidago* <Squarrosae> *erecta* (*speciosa* var. e.*) This occurs mostly on moderately dry acid soils of the Interior Low Plateaus, Appalachian regions and mid-Atlantic Coastal Plain (Cr, W). A coll. from HARL (MDKY) may be transitional to *roanensis*.

HAB f-8,11,10 B 4. **ABU** g9 s9 -2.

1916--*Solidago speciosa* Nutt. var. *speciosa*

Asteraceae <Astereae>: *Solidago* <Squarrosae> *speciosa* var. s. (*conferta*) This occurs mostly from the Ozarks to the Appalachians and mid-Atlantic states, usually in thin woods and brushy openings on base-rich soils. It has been combined with var. *rigidiuscula* and *S. erecta* in some recent treatments (K, J), but those taxa are fairly distinct (Cr, FNA 20).

HAB 8,11,10 D 3. **ABU** g9 s6 -4.

1917--*Solidago speciosa* Nutt. var. *rigidiuscula* Torr. & Gray

Asteraceae <Astereae>: *Solidago* <Squarrosae> *speciosa* var. *rigidiuscula* ("*angustata*")

This segregate of *speciosa* is centered in the Great Plains, but extends east locally in remnants of grassland on base-rich soils (Sm, F, Cr, FNA 20, W). There is no overlap of ranges within Ky. It is the "*speciosa*" that Short (1937) noted: "occurs in profuse abundance throughout the Barrens of Kentucky"; see also Pr and Harvill (1941). Further research is needed to determine if full species is warranted, as *S. rigidiuscula* (Torr. & Gray) Porter.

Leaves of *rigidiuscula* are distinctly narrower, and less persistent at the plant base, with inconspicuous basal rosettes. Also, leaves tend to be shallowly serrate to entire (versus often coarsely serrate), often more scabrous, and usually less bluish. Sm reported that that inflorescences are usually narrower, with thicker phyllaries that have a more conspicuous mid-vein, and with more deeply yellow rays. J. Semple (in FNA 20) reported that var. *rigidiuscula* is a diploid ($2n = 18$) like other species of sect. *Squarrosae*; but var. *speciosa* is known to have higher numbers ($2n = 18, 36, 54$).

HAB 8,10 D 4. **ABU** g9 s6 -5.

1918--*Solidago hispida* Muhl. ex Willd.

Asteraceae <Astereae>: *Solidago* <Squarrosae> *hispida* (bicolor var. *hispida*; concolor)

This is widespread in northeastern states and adjacent Canada, but centered in the midwest. There is much overlap with *bicolor*, and there are no clear differences in habitat. The only consistently observable difference from *bicolor* is corolla color: orange-yellow versus creamy/silvery white (F, Cr). On average, *hispida* is also reported to have broader inflorescences (Y), broader phyllaries with less contrastingly pale margins (F), and less distinctly clavate pappus bristles (FNA 20). Hybrids between these species have been reported (F, Cr), but no definitive study has been published.

HAB 11,7 C 3. **ABU** g9 s8 -2.

1919--*Solidago bicolor* L.

Asteraceae <Astereae>: *Solidago* <Squarrosae> *bicolor* (var. b.)

This is widespread in eastern North America, except on the Gulf Coastal Plain. See notes under *hispida*.

HAB 11,7 C 3. **ABU** g9 s8 -2.

1920--*Solidago puberula* Nutt.

Asteraceae <Astereae>: *Solidago* <Squarrosae> *puberula* (var. p.)

In Ky. this largely northeastern species is verified only from the Cumberland Mountains. It has often been confused with other pubescent species in the *erecta* group. Hairs on stems, in particular, are dense, minute and stiff as in *nemorialis*, but unlike the longer looser hairs of *hispida* or *bicolor*. Previous records from ESTI and MONT have been based on misidentifications; those from EDMO, ELLI and ROWA are not verified, and may be doubted (M).

HAB 11,7? B? 3? **ABU** g10 s4 -1.

1921--*Solidago roanensis* Porter

Asteraceae <Astereae>: *Solidago* <Squarrosae> *roanensis*

This is largely restricted to the central and southern Appalachians, where it occurs mostly at higher elevation. In Ky. it is known only from, or near, the Cumberland Mts. A few colls. suggest hybridization with *erecta*.

HAB 5,11? C? 3? **ABU** g9 s4 -1.

1922--*Solidago squarrosa* Nutt.

Asteraceae <Astereae>: *Solidago* <Squarrosae> *squarrosa*

This northeastern species has been collected at two sites on Pine Mt., here at the southern edge of its range: in PIKE (US), E.L. Braun #2048, 26 Sep 1938, steep slopes, woods, near Millard; and LETC (MDKY), A. Risk #2013, 11 Aug 1988, Elkins Br., non-forested wetland near head of stream, wet clay soil, elev. 2510 ft. These colls. may be somewhat atypical, and need further comparison with associated species of *Solidago* that might hybridize or be confused. Braun's coll. was made at the same locality as her colls. of *faucibus* (#2049-2050), and *patula* is also known on Pine Mt. Both those species have large basally disposed leaves, resembling *squarrosa*.

HAB 5? B? 2? **ABU** g8 s2? -1.

1923--*Solidago austrina* Small ?

Asteraceae <Astereae>: *Solidago* <Maritimae> cf. *austrina* ("gracillima"*; *stricta* ssp. g.)

In Ky. these plants were initially reported as *S. uliginosa* Nutt. from the lower Rockcastle Rv. (where often associated with *Eurybia saxicastellii*) and the lower Laurel Rv. (Palmer-Ball et al. 1988). There has been confusion between *S. austrina* (largely in the Piedmont and around the Southern Appalachians), *S. gracillima* Torr. & Gray (largely on the Coastal Plain), *S. uliginosa* Nutt. (a northern species that extends south to the Blue Ridge) and their relatives (Sm, FNA 19, W). The Ky. plants appear closest to *austrina* but further revision is needed (J. Semple, pers. comm.); see W for notes on characters.

HAB 1 C 4. **ABU** g8 s4 =.

1924--*Solidago uliginosa* Nutt. R

Asteraceae <Astereae>: *Solidago* <Maritimae> *uliginosa*

This is a variable northeastern species with segregates that have been treated in diverse ways (F, Cr, FNA 20). It has been recently reported by KSPNC (J; T. Littlefield, pers. comm.) from boggy openings in the Cumberland Mts. of WHIT, but verified colls. have not been seen. *S. uliginosa* is also reported from higher elevations in the Blue Ridge, south to at least Tenn. and N.C., but it is rare there and some identifications remain uncertain (FNA 19, W, PL). See also notes under *S. cf. austrina*.

1925--*Solidago arenicola* B.R. Keener & Kral

Asteraceae <Astereae>: *Solidago* <Humiles> *arenicola* ("randii var. *racemosa*"*)

These plants have been treated in various ways, often named "*racemosa*" as a species or as a segregate of the more northern or western relatives, *S. simplex* Kunth or *S. spathulata* DC. *S. arenicola* was recently described from Ala.

(Keener & Kral 2003). It also occurs in the southern Cumberland Plateau of Tenn. and Ky. along rocky banks of the Cumberland Rv. and its tributaries, plus the Obed Rv. and Emory Rv. (D. Estes, pers. comm.). It is similar to *S. plumosa*, which is known only from the Yadkin Rv. in N.C. (W).

Typical *arenicola* can also be confused with the widespread upland species, *erecta* (Keener & Kral 2003), but differs in its less numerous heads per stem (<30 versus >40), and larger individual heads, with longer involucre (7-9.5 mm versus 4-6.5 mm), more disc flowers per head (12-16 versus 6-10), and longer disc corollas (ca. 6 mm versus ca. 4 mm).

There is variation that needs further study. Plants along the Rockcastle (LAUR and PULA), main Cumberland (WHIT and some MCRE), Obed and Emory rivers, have glabrous achenes, as in typical *arenicola*. Plants along the Big South Fork (including part of the MCRE material) have hairy achenes that are relatively small and numerous per head (13-19), with involucre only 5.5-7.5 mm long, in more congested inflorescences, suggesting a transition to *racemosa*. An unusual coll. from the Rockcastle Rv. in PULA (KY) suggests a hybrid with *speciosa*.

HAB 1 + C 6. **ABU** g8 s5 =.

1926--*Solidago racemosa* Greene

Asteraceae <Astereae>: *Solidago* <Humiles> *racemosa* (*spathulata*/*simplex* ssp. *randii** var. *racemosa*)

This northeastern species is known from EDMO (DHL): A.T. Hotchkiss 69-9-27-3, 27 Sep 1969, in rocky crevices, moist sandstone cliffs above east end of Nolin River dam. It has also been reported from se. Ky., where there may be intergradation with *arenicola*. See notes under *arenicola*; this whole complex based on *simplex* (sensu lato) includes a polyploid series ($2n = 18, 36, 54$), but only tetraploids ($2n = 36$) are known in *arenicola* and *racemosa* (FNA 20).

HAB 1,12? + C? 6. **ABU** g8? s1? -1?

1927--*Solidago buckleyi* Torr. & Gray

Asteraceae <Astereae>: *Solidago* <Thyrsiflorae> *buckleyi*

This globally rare species is known mostly from the Ozarks Mts. of Ark. and Mo., but there are disjunct populations in s. Ill., s. Ind., and w. Ky., perhaps also n. Ala. and n. Ga. (Nesom 1990; FNA 20, W). Some of the eastern plants appear introgressed with *S. speciosa* (to the north), *S. petiolaris* Ait. (to the south) or similar species. Cr included *buckleyi* within the whole *petiolaris*

complex ($2n = 18, 36, 54$), which deserves further revision. The correct name remains somewhat uncertain, since the type consists of fragments from n. Ala. **HAB** 11,7,5 C 3. **ABU** g7 s4 -4.

1928--Solidago arguta Ait. var. arguta

Asteraceae <Astereae>: Solidago <Argutae> arguta var. a.

In Ky., this northeastern taxon is virtually unknown west of Appalachian regions; there is a disjunct population in sandstone ravines of EDMO. Further study of colls. is needed to clarify separation of varieties in this largely diploid ($2n = 18$) species. See also notes on its polyploid relatives, harrisii ($2n = 36$) and faucibus ($2n = ca. 90$).

HAB 5,11,7 B 3. **ABU** g8 s8 -2.

1929--Solidago arguta Ait. var. caroliniana Gray

Asteraceae <Astereae>: Solidago <Argutae> arguta var. caroliniana ("bootii", "yadkinensis")

These southeastern plants differ from var. arguta in their hairy (strigillose) seeds (FNA 20, W). Leaves remain mostly glabrous, and both taxa are probably diploids ($2n = 18$). Some authors (including F and Cr) have confused these plants with var. bootii (Hook.) E.J. Palmer & Steyermark, which is a more distinct plant centered in the Ozarks, with hairy leaves as well as seeds. The name *S. yadkinensis* (Porter) Small also appears to have been misapplied to some of these plants (Cr, W).

HAB 11,7,5? B 3. **ABU** g8 s7 -1.

1930--Solidago faucibus Wieboldt

Asteraceae <Astereae>: Solidago <Argutae> faucibus ("macroarguta" ined.) This decaploid ($2n = ca. 90$) is endemic of central Appalachian regions (FNA 20). It was recently described by Wieboldt & Semple (2003), but had been known informally as "macroarguta" by M and Campbell et al. (1993). It mostly occurs in relatively mesic sites at the base of forested slopes; arguta occurs more widely distributed in mesic to subxeric woods. Colls. from JACK, OWSL and MCRE (KY) are vegetative, and they may just be abnormal arguta, but Wieboldt did include the one from MCRE.

S. faucibus has distinctly larger involucre than arguta (4.5-7 mm long versus 2.5-5 mm), with 3 veins usually evident on phyllaries (versus only the mid-vein enlarged). It also tends to have shorter inflorescence branches, with less secund character and without naked bases. Its basal leaves tend to be

abruptly truncate (versus broadly cuneate), and its spreading caudices form extensive clonal patches, often 1-10 sq. m or more (versus < 1 sq. m).

HAB 5 C 2. **ABU** g6 s6 -1.

1931--Solidago harrisii Steele

Asteraceae <Astereae>: Solidago <Argutae> harrisii (arguta var. h.)

These plants occur in the eastern Knobs of Ky. or nearby. They are highly disjunct from typical *S. harrisii* in Ridge and Valley region of Md., W.Va. and Va. (Campbell et al. 1993). The Ky. plants appear somewhat distinct, with leaves less coriaceous (versus clearly coriaceous), glabrous or slightly scabrous above (versus clearly scabrous), and averaging wider at plant bases (mostly 7-13 cm versus 5-10 cm); variety status might be warranted. *S. harrisii* is a tetraploid ($2n = 36$), and deserves separation as a species from the diploid arguta (F, W).

HAB 12,11 + \ E 3. **ABU** g7 s7 =.

1932--Solidago patula Muhl. ex Willd.

Asteraceae <Astereae>: Solidago <Argutae> patula

Broadly defined, this eastern species is divisible into two taxa. Var. patula is centered in east-central states and may include all plants in Ky. However, colls. from BELL (GH) and CALL (MUR) appear transitional to var. strictula Torr. & Gray, which has relatively small, narrow leaves with less serration. Var. strictula occurs mostly on the southeastern Coastal Plain, and may be distinct enough to deserve species status as *S. salicina* Ell. (Cr, W).

HAB 6 B 3. **ABU** g9 s5 -4.

1933--Solidago sphacelata Raf.

Asteraceae <Astereae>: Solidago <Argutae> sphacelata (cordata)

This is largely restricted to subxeric ledges and cliff-tops on base-rich soils in woods of east-central states. It is a distinctive diploid ($2n = 18$), with an unusually short pappus, which led to its earlier placement in the genus *Brachychaeta* by Torrey, Gray and Britton (FNA 20).

HAB 11,12 + D 3. **ABU** g8 s8 -1.

1934--Solidago juncea Ait.

Asteraceae <Astereae>: Solidago <Juncea> juncea

This is widespread in eastern North America, but rare to absent on the southeastern Coastal Plain. In addition to having "basally disposed leaves" on flowering stems (declining in size from base to summit), juncea produces non-flowering shoots with large leaves during the summer. See notes under

missouriensis, which some colls. mapped here may approach: e.g. from GRAV (MUR), HARD (KY) and MCRA (MUR). These species are the first goldenrods to flower in Ky., usually during Jul-Aug. *S. juncea* is reputed to hybridize with several species (F); an unusual late flowering coll. from GARR (EKY) suggests a cross with *gigantea* (W. Overbeck, pers. comm.).

HAB f-10,9 B 4. **ABU** g9 s9 -1?

1935--*Solidago missouriensis* Nutt.

Asteraceae <Astereae>: *Solidago* <Junceae> *missouriensis*

This is a widespread variable species, centered in the Great Plains but with disjunct populations as far east as nw. Ga. (F, Cr, W; FNA 20). It is close to *juncea*, and some plants in Ky. may be hybridized; $2n = 18$ in both species. In *missouriensis*, leaves generally have 2 dominant lateral veins (versus several), and basal leaves are narrower (mostly 1-2 cm versus 2-7 cm). Also, its rhizomes are more slender and widely spreading. Thus it often resembles *gigantea* if basal leaves have withered.

Intraspecific taxonomy remains uncertain. Plants in Ky. are probably all referable to the largely midwestern var. *fasciculata* Holz, which is relatively robust but has small, less pubescent achenes. The coll. mapped here from EDMO (US) was initially misidentified by Davies (1955) as the closely related *S. gattingeri* Chapman, which is known only from the Ozarks of Ark. and Mo., plus a few disjunct sites in c. Tenn.

HAB f-10,9? C? 5. **ABU** g10 s7? -1?

1936--*Solidago nemoralis* Ait.

Asteraceae <Astereae>: *Solidago* <Nemorales> *nemoralis*

This variable species is widespread across eastern and central North America. Several colls. from Ky., especially eastern regions, appear transitional to the southeastern var. *haleana* Fern., with more robust, branched habit, and more reduced leaves on the branches. However, that variety intergrades broadly with typical northern plants (Cr), and it may not deserve recognition (FNA 20).

The western var. *longipetiolata* (MacKenzie & Bush) Palmer & Steyermark, recently treated as ssp. *decemloba* (DC.) Brammall ex Semple (FNA 20), is a more distinct tetraploid; $2n = 36$ (versus 18 in typical *nemoralis*). It has been reported from Ky. by Harvill (1941), F and others (M), but no convincing colls. are known (check colls. of C.W. Short at PH).

HAB f-12,10 D 5. **ABU** g10 s10 -1?

1937--*Solidago radula* Nutt. R

Asteraceae <Astereae>: *Solidago* <Nemorales> *radula*

This is a largely Ozarkian species, but it is also known from a few scattered locations across southeastern states, usually in rocky woods on base-rich soils. Variation needs further attention; $2n = 18$ and 36 (FNA 20). The only record from Ky. may be a coll. from HARD (Cranfill & Medley 1981; M). The coll. cannot now be located, and the area has been revisited with no success. Nevertheless, Cronquist (Cr) may have confirmed the coll. since he included w. Ky. in the range of *radula*; see also FNA 20. Although generally classified with *nemoralis*, *radula* appears similar to some species of the *Triplinerviae* (especially *rupestris*; see W).

1938--*Solidago ulmifolia* Muhl. ex Willd.

Asteraceae <Astereae>: *Solidago* <Venosae> *ulmifolia* (var. u.)

This widespread eastern species is variable, especially in the Ozark region, but only diploids ($2n = 18$) are known. Most or all plants in Ky. are referable to var. *ulmifolia*, but colls. from HICK (JC for KY) and UNIO (GH, KY-Agr. and Purdue Univ.) may be transitional to the largely Ozarkian var. *palmeri* Cronq., with relatively broad and hairy leaves. The coll. from UNIO was misidentified as *S. drummondii* Torr. & Gray by Shacklett (1937) and Harvill (1941). *S. ulmifolia* has sometimes been reported to hybridize with *rugosa* and other species (F), but there has often been outright misidentification by striving solidaginists (Y).

HAB 11,5,7 D 2. **ABU** g10 s9 -3.

1939--*Solidago odora* Ait.

Asteraceae <Astereae>: *Solidago* <Venosae> *odora*

This ranges widely across southeastern and Appalachian states, but it is restricted to acid soils in thin woods and openings on suberic sites (not in cooler mountains). It is a distinctive diploid ($2n = 18$), well-known for its anise-flavored leaves, which can be used for a stimulating tea.

HAB 10,7,12 B 4. **ABU** g9 s8 -2?

1940--*Solidago rugosa* P. Mill. var. *rugosa*

Asteraceae <Astereae>: *Solidago* <Venosae> *rugosa* var. r.

This species is widespread on acid soils across eastern North America, except in the upper mid-west, and there is significant variation; $2n = 18, 36, 54$ (Cr, FNA 20). Separation of var. *rugosa* (largely diploid) versus var. *aspera* (largely tetraploid) remains somewhat provisional in Ky. and needs further

checking. Some colls. have been referred to var. villosa (Pursh) Fern., which may be transitional to var. aspera. Colls. from HARL (EKY) and perhaps MCRE (KY) are at least transitional to the largely glabrous northeastern var. sphagnophila Graves, but further review is needed before definitive mapping.
HAB 6,9 C 4? **ABU** g9 s8 -3.

1941--Solidago rugosa Ait. var. aspera (Ait.) Fern.

Asteraceae <Astereae>: Solidago <Venosae> rugosa var. aspera
This taxon (often treated as a subspecies) is about as widespread as var. rugosa, but more common to the south. Reports of the strictly southern var. celtidifolia (Small) Fern. (which has lax leafy panicles) from the Ohio Valley appear to be based on atypical var. aspera (GH, M, FNA 20). The "Fireworks" cultivar of var. aspera, which has recently become popular in gardens across eastern states, was selected from the southeastern Coastal Plain via the North Carolina Botanical Garden.

HAB 9,6? C 5. **ABU** g9 s8 -3.

1942--Solidago gigantea Ait. var. gigantea

Asteraceae <Astereae>: Solidago <Triplinerviae> gigantea var. g.
This is widespread in eastern and central North America. Chromosome number varies ($2n = 18, 36, 54$), generally increasing from east to west, but it may not be clearly associated with morphological segregates (FNA 20). Although much less abundant in Ky. than altissima, gigantea occurs along larger streams and in lowland meadows across most the state.

S. gigantea is distinguished from the canadensis-altissima complex in Ky. by its completely glabrous stems below the inflorescence (versus puberulent at least above middle), often with glaucous bloom at first then turning purplish (versus just yellowish-green). Leaves are generally glabrous, except (at least in var. gigantea) for hairs along the three main veins on lower surfaces (versus usually pubescent across the surface). Flowers are similar, but usually develop a month or so earlier, in August (versus September).

HAB f-9,6,4,1 D? 4. **ABU** g10 s8 -3?

1943--Solidago gigantea Ait. var. serotina (Kuntze) Cronq.

Asteraceae <Astereae>: Solidago <Triplinerviae> gigantea var. serotina (leiophylla)
This smooth-leaved variety may be weakly defined. It is about as widespread as typical gigantea, but with a more northern, overlapping range (F). Some plants can be difficult to distinguish from rupestris, since they often flower

later than typical gigantea and stems can lack clear glaucous or purplish surface.

HAB 1,4,6? D? 4. **ABU** g10 s9 -2?

1944--Solidago rupestris Raf.

Asteraceae <Astereae>: Solidago <Triplinerviae> rupestris (canadensis var. r.)
This is known only from rocky riverbanks, generally on calcareous material, in disjunct localities of Md., Va., Ky., Tenn. and Ind. It is locally abundant and has often been overlooked. Some colls. are difficult to distinguish from gigantea var. serotina, which often occurs in the same habitats, and intergradation has been suspected. In eastern regions both taxa may be largely diploid ($2n = 18$), but polyploids also occur across their ranges (Cr, FNA 20).

In rupestris, flowering heads tend to be smaller than in gigantea: involucre average ca. 2-3 mm high (versus 3-4 mm); florets numbers 2-7 (versus mostly 7-12). Flowers tend to open later in Ky. (late Aug-early Sep versus mid-late Aug), and form on longer branches (primary ones mostly 10-20 cm versus 5-10 cm). Without flowers, rupestris can usually be distinguished from gigantea by its leaves, which are narrower (the largest mid-cauline ones ca. 10-15 mm wide versus 15-30 mm) and deeper green. Also, its stems are more clustered, without the glaucous bloom and purplish hue of typical gigantea.

HAB 1 + E 4. **ABU** g7 s7 -1.

1945--Solidago canadensis L.

Asteraceae <Astereae>: Solidago <Triplinerviae> canadensis (+ var. hargeri)
Further checking in Ky. is needed for potential transitions to altissima or other variants. However, it is reasonable to treat canadensis and altissima as distinct species (FNA 20; Y, W). S. canadensis is a diploid ($2n = 18$ versus 36 or 54) with more northern range. It differs in its stems glabrate or sparsely hairy distally (versus usually hairy throughout); mid- to distal cauline leaves clearly serrate (versus minutely serrate to entire), usually glabrous or sparsely hairy below (versus densely hairy); inflorescence broadly pyramidal (versus narrow to broadly); involucre 1.7-2.5 (3) mm long (versus 2.5-4.5 mm), usually produced in Aug-Sep (versus Sep-Oct); insect galls are usually lacking (versus common).

Colls. included here from HENR (KY) and perhaps elsewhere (CARL, FULT & HICK at MUR) have been referred to the relatively hairy var. hargeri Fern., which often resembles altissima. That variety is prevalent in some midwestern regions, including most of Mo. (Y).

HAB f-10? E? 5. **ABU** g9 s8 +1?

1946--Solidago altissima L. var. gilvocanescens (Rydb.) Semple ?

Asteraceae <Astereae>: Solidago <Triplinerviae> altissima cf. var. gilvocanescens (pruinosa, canadensis* var. g.)

This taxon is known mostly from the Great Plains. It has smaller involucre (ca. 2-3 mm long versus 3-4 mm), and includes some diploids, appearing somewhat transitional to canadensis (FNA 20). The plants mapped here appear somewhat distinct, with a clustering of records in northern regions of the state, but further verification is needed.

HAB F-10? D? 5. **ABU** g9? s6? +1?

1947--Solidago altissima L. var. altissima

Asteraceae <Astereae>: Solidago <Triplinerviae> altissima (canadensis* var. scabra)

This is widespread across eastern and central North America, but has not been recognized in some manuals; see notes under canadensis. There may be some intergradation with canadensis in Ky., and there appear to be occasional hybrids with gigantea (e.g. from MCLE at EKY). Insect galls are common on altissima, but rare on canadensis and gigantea (as cited in Y).

HAB F-10,8,9 D 5. **ABU** g10 s10 +3.

1948--Solidago shortii Torr. & Gray

Asteraceae <Astereae>: Solidago <Triplinerviae> shortii

This highly restricted endangered species is known from a cluster of sites in the Blue Licks area of Ky. (FLEM, NICH, ROBE), in cedar glades and adjacent old fields (Baskin & Baskin 1985). It was also present on Rock Island at the Falls of the Ohio River (JEFF) during the 19th Century, and it has been recently rediscovered nearby along the Blue River in Harrison Co., Ind. (Homoya & Abrell 2005). Its habitats along these rivers are--or were--scoured rocky riverbanks, often in close association with Hypericum sphaerocarpon. Orbexilum stipulatum, probably now globally extinct, was also closely associated at the Falls of Ohio.

The historic plants from Falls of the Ohio fall largely within the range of variation exhibited by plants from the Blue Licks locality (Beck et al. 2001). However, despite its rarity and uniform chromosome number (with $2n = 36$), shortii displays considerable variation, and some material from ROBE (KY) appears hybridized with altissima (with $2n = 36$ or 54). S. shortii differs from altissima in its glabrous leaves, and its fewer (5-7 versus 8-13), broader (0.6-

1.2 mm versus 0.1-0.5 mm) ray florets. Its strong similarities to gigantea and rupestris also deserve further study.

HAB 12,10,8 ::+ E 5. **ABU** g3 s3 -3.

1949--Oligoneuron rigidum (L.) Small var. rigidum

Asteraceae <Astereae>: Oligoneuron [Solidago] rigidum var. r.

See notes under var. glabratum, which may intergrade; some colls. needs checking (FNA 20). Note also that separation of Oligoneuron from Solidago remains controversial; these species can also be treated as Solidago sect. Ptarmicoidei (FNA 20; W).

HAB 10,12? D 5. **ABU** g10 s6 -4.

1950--Oligoneuron rigidum (L.) Small var. glabratum (E.L. Braun) Nesom

Asteraceae <Astereae>: Oligoneuron [Solidago] rigidum var. glabratum (S. jacksonii)

This southeastern taxon appears to be commoner in Ky. than the largely midwestern var. rigidum; the more western var. humilis (Porter) S.B. Heard & Semple is unknown east of the Mississippi and Ohio Rivers (FNA 20). Distributions overlap considerably and there is some intergradation, but var. glabratum appears to be more restricted to rocky glades than var. rigidum, which is locally common in remnants of taller grassland on deeper soils.

Var. glabratum has also been treated as a subspecies (FNA 20) or a species (F). Compared to typical rigidum, it is generally less hairy, with glabrous phyllaries (versus strigillose to glabrate). It is generally less robust, with smaller inflorescences (usually ca. 15-45 heads versus 30-120), which tend to be more rounded, and with narrower leaves (the larger ones ca. 1-5 cm wide versus 2-10 cm); $2n = 18$ (versus 18 and 36).

HAB 12,10? D 5. **ABU** g7 s7 -4.

1951--Oligoneuron album (Nutt.) Nesom R

Asteraceae <Astereae>: Oligoneuron [Solidago] album (S. ptarmicoides)

This was reported by Meijer (1972b) and Bryant (1972) but with no known vouchers. It is a northern prairie species with a few disjunct southeastern records.

1952--Euthamia caroliniana (L.) Porter ex Porter & Britt. W

Asteraceae <Astereae>: Euthamia [Solidago] caroliniana (tenuifolia*)

This diploid ($2n = 18$) mostly occurs on the eastern and southeastern Coastal Plains, but it does rarely occur as a waif further west. A coll. from stripmine spoil in KNOX was made by H. Bryan (M), and may become processed at EKY or WKY.

1953--*Euthamia graminifolia* (L.) Nutt.

Asteraceae <Astereae>: *Euthamia* [*Solidago*] *graminifolia* (nuttallii)
This diploid ($2n = 18$) is widespread in eastern North America, but rare to absent on most of the southeastern Coastal Plain. Further study of variation is needed. Virtually all colls. from Ky. are referable to the relatively robust, hairy var. *nuttallii* (Greene) Fern. (F, W), but that taxon is not recognized in some recent treatments (FNA 20, Y). The coll. from BULL (KY) matches the more northern var. *graminifolia*. Plants named var. *media* (Greene) S.K. Harris in Mo. proved to be conspecific with *gymnospermoides* (Y).
HAB f-10,9 C 5. **ABU** g9 s9 +1?

1954--*Euthamia gymnospermoides* Greene) T

Asteraceae <Astereae>: *Euthamia* [*Solidago*] *gymnospermoides*
This has often been confused with *leptocephala*, *graminifolia*, or other species (Sieren 1981; Cr, FNA 20, W). *E. gymnospermoides* occurs widely in the midwest from Ontario to Louisiana. Most records from the Ohio River watershed may be erroneous, as are all records from Atlantic coastal states (W). Records of BA and PL from Ky. are apparently based on misidentified colls. of *leptocephala* at MEM (M).

1955--*Euthamia leptocephala* (Torr. & Gray) Greene

Asteraceae <Astereae>: *Euthamia* [*Solidago*] *leptocephala*
This is a species of the lower Mississippi Valley and Gulf Coast that has been confused with the largely midwestern *gymnospermoides* (Sieren 1981; Cr, FNA 20, W). Together, these two taxa contain a polyploid series; $2n = 18, 36$ (most *gymnospermoides*), and 54 (most *leptocephala*). Records of *leptocephala* from Ky. are mostly based on colls. of R. Athey (probably at MEM) that were identified by R. Kral (M), but need further verification. The reported coll. from HICK (Grubbs & Fuller 1991) has not yet been located at MUR.
HAB f-10,9,1 C? 5. **ABU** g8 s6 -3.

1956--*Amphiachyris dracunculoides* (DC.) Nutt.

Asteraceae <Astereae>: *Amphiachyris* [*Gutierrezia*] *dracunculoides*

This southwestern annual has disjunct occurrences in c. Ky. and c. Tenn., where it was treated in *Xanthocephalum* (Ch). It is unknown if these eastern populations are relictual from presettlement glades and grasslands, or if they are more recently adventive. In Ky. and Tenn., the species is often associated with grazed or otherwise disturbed sites. Further east, it is considered probably adventive, sometimes appearing as waifs at wool-combing mills (W).

Amphiachyris is closely related to *Gutierrezia* (of southwestern states to South America), and sometimes combined (FNA 20); chromosome numbers are remarkably low in these plants (usually $2n = 8$).
ALI w. **HAB** g-12,10 ::? E 5. **ABU** g8 s4 -3?

1957--*Aster tataricus* L. f. C

Asteraceae <Astereae>: *Aster tataricus*
This cultivated species occasionally escapes, but it is probably not truly naturalized. There are colls. from BOUR, CAMP and CART (M).
ALI EU.

1958--*Eurybia divaricata* (L.) Nesom

Asteraceae <Astereae>: *Eurybia* [*Aster*] *divaricata*
This largely Appalachian species is typically associated with beech forest on medium-acid soils. It is virtually absent west of the Cliff Section and eastern Knobs. A few plants have been found in JESS on terraces along the Ky. Rv. Palisades (Campbell & Meijer 1989).
HAB 5,11,7 C 1. **ABU** g8 s8 -3.

1959--*Eurybia schreberi* (Nees) Nees

Asteraceae <Astereae>: *Eurybia* [*Aster*] *schreberi*
Cr noted that this northeastern hexaploid ($2n = 54$) may have originated through hybridization between *macrophylla* ($2n = 72$) and *divaricatus* ($2n = 18$). *E. schreberi* differs from typical *macrophylla* in its pure white flowers (versus usually pale to deep lavender, bluish or violet), and its glandless to sparsely glandular phyllaries and inflorescence branches (versus densely glandular). Upper leaf surfaces are eglandular and glabrous to sparsely villous above (versus glandular and scabrous but highly variable); well-developed basal leaves have a broad, nearly rectangular sinus (versus more rounded). Both species often spread clonally in the shade, with little or no flowering.
HAB 5,11,7 D 2. **ABU** g8 s7 -1.

1960--*Eurybia macrophylla* (L.) Cass. var. *macrophylla*

Asteraceae <Astereae>: *Eurybia* [Aster] *macrophylla* var. *m.* (*pinguifolia*, *velutina*)

This northeastern octoploid ($2n = 72$) is under-collected, because plants often do not flower in shady undisturbed forest (see also Y). Several segregates were recognized by F and others, but have been combined in recent treatments (e.g. Cr, FNA 20). Included here are the relatively smooth var. *pinguifolia* Burgess (with several colls. from Ky.) and the relatively hairy var. *velutina* Burgess (as in the coll. from NELS), as named within Aster. All of these plants generally have glandular inflorescences with bluish flowers, but leaves differ greatly in their shape, glandularity and pubescence.

HAB 5,11,7 C 2. **ABU** g9 s8 -2.

1961--*Eurybia macrophylla* (L.) Cass. var. *ianthina* (Burgess) new comb.

Asteraceae <Astereae>: *Eurybia* [Aster] *macrophylla* var. *ianthina*

This variety may be poorly defined (F, W); the mapping here is provisional. Distinction from smoother forms of var. *macrophylla* can be difficult. Colls. often have paler lilac or white flowers, and with their less developed glands, they appear somewhat intermediate between *macrophylla* and *schreberi*.

HAB 5,11,7 C? 2. **ABU** g8? s7? -2.

1962--*Eurybia radula* (Ait.) Nesom

Asteraceae <Astereae>: *Eurybia* [Aster] *radula*

This diploid ($2n = 18$) occurs mostly on wet sites from northern Appalachian regions northeast to Newfoundland. Further south, it is known from a few sites in W.Va., Va. and Ky., where it has been found only on lowlands of the Cumberland Rv. in WHIT (Campbell et al. 1990).

HAB 6 C 3. **ABU** g8 s2 -4?

1963--*Eurybia saxicastelli* (J.J.N. Campb. & M. Medley) Nesom

Asteraceae <Astereae>: *Eurybia* [Aster] *saxicastelli*

This hexaploid ($2n = 54$) is probably derived from the northeastern diploid, *radula*. It was discovered during the 1980s in LAUR and PULA along the Rockcastle River (Campbell & Medley 1989), and then along the Big South Fork of Cumberland Rv. in Ky. (MCRE) and Tenn. (Scott Co.). More robust plants tend to have narrower leaves, denser heads, and paler flower color (usually white versus blue); these may be associated with more open sites. Despite some initial signs, no significant differences in plants have been found between the two rivers.

HAB 1,4 C 3. **ABU** g5 s4 -1.

1964--*Eurybia surculosa* (Michx.) Nesom

Asteraceae <Astereae>: *Eurybia* [Aster] *surculosa*

In Ky. this Southern Appalachian tetraploid ($2n = 36$) is restricted to seasonally xeric sandy soils of the Appalachian Cliff Section, plus a few localities in the southern Knobs and Cumberland Mts. It often forms large rhizomatous colonies, but flowers little except after fire or other disturbance. A common associate is *Pityopsis graminifolia*.

HAB 12,10 + A 4. **ABU** g7 s7 -2?

1965--*Eurybia hemispherica* (Alexander) Nesom

Asteraceae <Astereae>: *Eurybia* <Heliastrum> [Aster] *hemispherica* (*A. paludosus* ssp. h.)

This occurs mostly in grasslands and thin woods on base-rich uplands of the Gulf Coastal Plain and scattered localities from the Ozarks to southern Ridge & Valley. In Ky. it is known only from outlying plants on roadsides in CALL (MUR), TRIG (recent coll. of JC along the Trace in LBL) and WARR (recently coll. of T. Barnes along Petros-Browning Road). These sites are probably remnants of original open woodland or grassland, now virtually all cleared for farmland or grown into forest.

HAB 12,10 +? D? 4? **ABU** g10 s2 -5.

1966--*Symphotrichum cordifolium* (L.) Nesom

Asteraceae <Astereae>: *Symphotrichum* <S-Heterophylli> *cordifolium* (var. c.)

This is a widespread eastern species of somewhat mesic woodlands and edges. Most plants mapped here appear to be typical *cordifolium*, but variation needs further study; $2n = 16, 32$ (FNA 20) and perhaps other numbers (Cr). See also notes under *lowrieanum*. Occasional plants appear hybridized with *undulatum* (e.g. NELS & ROWA at KY), *urophyllum* (JESS at KY), *laeve* (B), or other species. Some colls. (ADAI & TAYL at Field) are referable to var. *polycephalum* (Porter) Nesom, which is not recognized in recent treatments.

Typical *cordifolium* is distinguished from related species by its rays usually bluish to purplish (versus brighter blue to white); phyllaries have obtuse to acute, purplish tips (versus usually more acute to acuminate, green) with moderately elongated blades (l/w ca. 2-3); lower leaves are deeply cordate (versus usually less cordate to truncate) and deeply toothed (versus shallowly toothed to entire), with scarcely or obscurely winged petioles (versus often

strongly winged). Plants vary in pubescence, but typically do not approach glabrous or densely hairy conditions.

HAB 7,5,8 D 2. **ABU** g9 s9 -3.

1967--Symphyotrichum lowrieanum (Porter) Nesom

Asteraceae <Astereae>: Symphyotrichum <S-Heterophylli> lowrieanum (cordifolium var. laevigatum)

Mapping here is provisional. *S. lowrieanum* is often considered to be a largely Appalachian taxon close to *cordifolium* (Cr, W), but it has been combined in some treatments (FNA 20). In more distinctive plants, leaves are glabrous and slightly glaucous, with less serrated margins, less cordate bases (at least in upper leaves), and more winged petioles (F, J); phyllaries usually lack purplish tips. Those plants appear closely related to *urophyllum*, differing in their more obtuse phyllaries, with shorter green blaze (l/w ca. 1-1.5); and perhaps more open inflorescences (Cr, W).

However, many colls. mapped here appear closer to typical *cordifolium*, and are assigned here based only on their virtually glabrous, slightly glaucous leaves. Also, occasional colls. appear hybridized with other species, especially *undulatum* (e.g. from HARL at EKY, PERR at KY). Cronquist (1980, Cr) and others have suggested that *lowrieanum* is derived from hybrids between *cordifolium* and *laeve* (*X schistosum* (Steele) Nesom), but plants mapped here rarely occurs in the same habitat as *laeve*.

HAB 5,11,7 C 3? **ABU** g8 s8 -2.

1968--Symphyotrichum urophyllum (Lindl.) Nesom

Asteraceae <Astereae>: Symphyotrichum <S-Heterophylli> urophyllum (A. sagittifolius, cordifolius var. s.)

This species of east-central states is close to *cordifolium* and often confused. In some recent treatments, its circumscription has been tightened, with only diploids documented ($2n = 16$); compare FNA 20 with Cr. *S. urophyllum* may be distinguished from *cordifolium* by its rays usually pale blue to white/cream (versus blue-purple), phyllaries with relatively long green blazes (l/w ca. 4-5 versus 2-3 and purplish); leaves are shallowly cordate to truncate (versus cordate) and shallowly toothed (versus sharply). It is typical of more open, drier or disturbed habitats, where it appears most distinct. There may be occasional hybridization with *undulatum*, *shortii*, *cordifolium*, and *drummondii*; see notes under those species.

HAB f-12,10 C? 4. **ABU** g9 s8 -4.

1969--Symphyotrichum drummondii (Lindl.) Nesom

Asteraceae <Astereae>: Symphyotrichum <S-Heterophylli> drummondii (A. sagittifolius var. d.)

This largely midwestern species is generally distinct, but may occasionally hybridize or introgress with *urophyllum*, *cordifolium*, *shortii* and *undulatum* (Cr; FNA 20, Y). Introgression with *cordifolium* may have increased after settlement in Mo. (St). Compared to *urophyllum*, *drummondii* is densely hairy (versus thinly); phyllaries have less elongated green blazes (l/w ca. 2-3 versus 4-5); and rays are usually bright blue (versus pale bluish, lilac or white); FNA 20 reported $2n = 16$ and 32 versus just 16.

HAB f-10,12,9 C 4. **ABU** g9 s8 -4.

1970--Symphyotrichum texanum (Burgess) Semple R

Asteraceae <Astereae>: Symphyotrichum <S-Heterophylli> texanum (*drummondii* var. t.*)

This southwestern taxon has been treated as a species (Cr), subspecies (M), or variety (FNA 20, J) of *drummondii*. Plants are relatively short, with long minutely bracteate flowering branches; rays are bluish-white; cypselae are strigillose; $2n = 32$ (FNA 20). *S. texanum* is virtually unknown east of the Mississippi Rv., except in Miss. and perhaps Ala. It may not even be verified in Mo. (Y). There have been several reports from Ky. (M), but these are erroneous or remain dubious.

1971--Symphyotrichum shortii (Lindl.) Nesom

Asteraceae <Astereae>: Symphyotrichum <S-Heterophylli> shortii (A. camptosorus)

This midwestern species is usually distinct due to its entire to subentire leaves, and phyllaries with relatively short green blazes (l/w ca. 1-1.5). But there is significant variation in pubescence and other characters; $2n = 16$ (mostly) and 32. In Ky. occasional plants suggest hybridization with *urophyllum* (BRAC at NKU), *cordifolium*, *undulatum* and *oolentangiense* (see notes under that name).

HAB 11,5,7 E 2. **ABU** g9 s9 -3.

1972--Symphyotrichum oolentangiense (Riddell) Nesom R

Asteraceae <Astereae>: Symphyotrichum <S-Heterophylli> oolentangiense (A. azureus)

This midwestern species (previously known as *Aster azureus* Lindl.) is close to *shortii* (FNA 20), but differs in its less cordate leaves, less hairy phyllaries and larger heads; $2n = 32$ (versus mostly 16). It is widespread over much of

Ill., Ind. and Ohio, but generally rare or absent in southeastern states (PL). In Ky. there have been several reports of *oolentangiense* from western regions (M, FNA 20), but no colls. are verified here. It has been confused with *shortii* in the state, and some plants appear somewhat intermediate, including colls. from ALLE, FULT, MCLE, MEAD and WARR. Some introgression may be also expected with *drummondii*, *urophyllum* and *laeve* (FNA 20; see also St).

1973--*Symphotrichum undulatum* (L.) Nesom

Asteraceae <Astereae>: *Symphotrichum* <S-Heterophylli> *undulatum*
This is a widespread variable species of woodlands on dry acid soils across most eastern states; $2n = 16$ and 32 (FNA 20). However, it is absent in the upper mid-west, and uncommon to rare in much of w. Ky. and w. Tenn. *S. undulatum* appears to form occasional hybrids with *shortii* (e.g. from BOUR, BULL, MCRA and POWE), *urophyllum* (WOLF), *cordifolium* (CART and MCRE), *lowrleanum* (PERR), *laeve* (WAYN), *dumosum* (BULL), and perhaps other species. Unusually narrow leaved plants have been named *A. undulatus* var. *loriformis* Burgess (e.g. from NELS at MICH).

HAB 11,7,8 B 2. **ABU** g10 s9 -2.

1974--*Symphotrichum laeve* (L.) A.& D. Löve

Asteraceae <Astereae>: *Symphotrichum* <S-Heterophylli> *laeve* (var. 1.)
Broadly defined, this species is a variable hexaploid ($2n = 48$), widespread across eastern and central North America. Typical *laeve* is most common in midwestern regions, usually growing in grasslands and thin woodlands on base-rich soils. In Ky. there are records of apparent hybrids with *undulatum* and *cordifolium* (see colls. at EKY and B). Elsewhere hybrids are known with several other species in subsections *Heterophylli*, *Dumosi* and *Porteriani* (FNA 20).

HAB 12,11,10? D 4. **ABU** g8 s8 -4.

1975--*Symphotrichum concinnum* (Willd.) new comb.

Asteraceae <Astereae>: *Symphotrichum* <S-Heterophylli> *concinnum* (laeve var. c.*)

This largely southeastern taxon is centered in Appalachian regions, in contrast to typical *laeve*, which is largely midwestern. The only clear difference in *concinnum* from typical *laeve* is its narrower, less clasping leaves, but it has been considered a distinct species in some treatments (F, Cr). There may be intergradation in Ky., as reported by B. Across its whole range (which remains poorly documented), *concinnum* may prove to be a miscellaneous group of narrow-leaved variants adapted to local conditions, especially on

non-calcareous or highly leached soils. Relatively extensive and distinctive populations in Ky. are documented only on rocky sandstone banks of the Rockcastle, Cumberland and Big South Fork Rivers.

HAB 1,12 C 4. **ABU** g8 s6 -1.

1976--*Symphotrichum puniceum* (L.) A.& D. Löve

Asteraceae <Astereae>: *Symphotrichum* <S-Occidentales> *puniceum* (var. p.)

This diploid ($2n = 16$) occurs in open swampy woods, seeps and wet meadows on acid soils in Appalachian regions, northeastern states and across southern Canada. In Ky. it is rare, with most records from remnants of significant wetlands in Appalachian regions or nearby. The outlying western coll. from CALL (MUR) was initially misidentified as *A. praealtus*: R. Athey #5132, 14 Oct 1985, Backusburg, West Fork of Clarks River at Ky 464, in pond bordering river.

HAB 4,6 C 4. **ABU** g9 s4 -4.

1977--*Symphotrichum firmum* (Nees) Nesom

Asteraceae <Astereae>: *Symphotrichum* <S-Occidentales> *firmum* (A. lucidulus, *puniceus* var. f.)

This largely midwestern species is close to *puniceum*, but considered distinct in most recent treatments; $2n = 16$ and 32 (Cr, FNA 20, W). *S. firmum* differs in its long creeping rhizomes (versus stout caudex), forming large patches; upper stems are pubescent in lines to glabrous (versus uniformly hairy); leaves are distinctly crowded in the inflorescence. It is typical of more calcareous sites; see also St and Y. In Ky., the only known record is an 1840s coll. of C.W. Short from FAYE (PH): "Kentucky River banks north of Elk Lick Creek".

HAB 1? C? 4? **ABU** g8 s1? -6?

1978--*Symphotrichum prenanthoides* (Muhl. ex Willd.) Nesom

Asteraceae <Astereae>: *Symphotrichum* <S-Occidentales> *prenanthoides*

This rhizomatous species occurs in a relatively narrow range from mid-Atlantic states (Mass. and Va.) to midwestern states (Minn. and Iowa). Despite a range of chromosome numbers ($2n = 32, 48, 64$), there has been virtually no recognition of segregates. *S. prenanthoides* usually grows along banks of smaller streams and on damp adjacent terraces and slopes, generally in medium acid soils. In Ky. it is widespread in Appalachian regions. Further west it is much more restricted but locally common in hilly sections of the Bluegrass and Knobs regions.

HAB 4,6 C? 3. **ABU** g9 s9 -3.

1979--Symphyotrichum lateriflorum (L.) A. & D. Löve

Asteraceae <Astereae>: Symphyotrichum <S-Dumosi> lateriflorum

This is widespread in woodlands of eastern North America. It is usually distinct due to its long disc corolla lobes, which turn reddish-purple to brown; inflorescences usually have relatively long divaricate to ascending sub-racemiform branches, with heads somewhat secund on 0-1 cm peduncles; lower leaves are relatively broad, typically with hairy mid-veins; stems tend to be ascending (versus strictly erect), on woody caudices with relatively short rhizomes.

However, lateriflorum is highly variable ($2n = 16, 32, 48$), and hybrids are known with several other species, sometimes making identification difficult (Semple et al. 2002; FNA 20, Y, W). Several colls. from Ky. have been referred to var. angustifolium (Wieg.) Nesom, var. hirsuticaule (DC.) Nesom, var. horizonatale (Desf.) Nesom (= A. pendulus Ait.), or var. tenuipes (Wieg.) Nesom, but these taxa have not been consistently recognized in recent treatments. In Ky. distinct plants with relatively narrow leaves and glabrous mid-veins are known from streamheads and seeps in BELL, POWE, MARS, MCRE and elsewhere (EKY, KY, Univ. of Waterloo). The name var. tenuipes was apparently misapplied to such plants by F and others; they can probably be included within var. angustifolium, which is known mostly from more northeastern regions (Semple et al. 2002).

HAB f-8,6,10,4 C 3. **ABU** g10 s10 -2.

1980--Symphyotrichum ontarione (Wieg.) Nesom

Asteraceae <Astereae>: Symphyotrichum <S-Dumosi> ontarione (var. o.; A. panotrichus)

This is widespread on damp fertile soils in much of eastern North America, centered in midwestern regions but rare to absent in more southeastern states (W). Typical plants are tetraploid ($2n = 32$), and appear somewhat intermediate between lanceolatum and lateriflorum in several characters, but distinguished by their uniformly puberulent upper leaves and stems (FNA 20, Y and their citations). Disc corollas of ontarione have lobes are about 1/2 as long as their inflated sections; those of lateriflorum are about 2/3; those of lanceolatum and other related species are about 1/3 or less. Its habitat is also intermediate.

S. ontarione seems consistently distinct in Ky., but it is sometimes confused with lanceolatum since lower leaves are often glabrate to glabrous. More glabrous diploids around the Great Lakes have been named var. glabratum (Semple) Brouillet & Bouchard (= A. lateriflorus var. tenuipes; J.C. Semple, pers. comm.).

HAB f-8,6,10,4 E 4. **ABU** g9 s9 -2?

1981--Symphyotrichum lanceolatum (Willd.) Nesom

Asteraceae <Astereae>: Symphyotrichum <S-Dumosi> lanceolatum (A. "simplex")

This variable species ($2n = 32$ to 64) is widespread across eastern North America. It needs further revision in Ky., using recent treatments of J.C. Semple (FNA 20; Semple et al. 2002) and others (Y, W). S. lanceolatum usually occurs in dense stands with erect stems on distinctly long rhizomes, ascending paniculate branches, and heads usually on 0.5-5 cm peduncles (rarely secund). New shoots are produced only at distance from stem bases, as in ontarione and dumosum but not lateriflorum or pilosum. S. lanceolatum can hybridize with several other species, including lateriflorum, ontarione and racemosum. It is often confused with ontarione, but leaves are usually more elongated and largely glabrous (versus softly short-hairy, at least on upper leaves).

Many Ky. plants were previously known as "Aster simplex Lam." or A. lanceolatus var. simplex (Willd.) A.G. Jones, but the type of simplex suggests a hybrid with lateriflorum (Cr). Most plants in Ky. and Tenn. (Ch) may be referable to the widespread, southeastern var. latifolium (Semple & Chmiel.) Nesom, with relatively large heads and broad leaves ($2n = 64$). The upper midwestern var. interior (Wieg.) Nesom, with relatively small heads ($2n = 48, 64$), has been reported from BULL (Gunn 1968), CARL (Mohlenbrock et al. 1966), ESTI (Anderson 1947), and elsewhere, but colls. have not yet been reviewed. The more northern var. lanceolatum (including A. simplex var. ramosissimus (Torr. & Gray) Cronq.), with relatively narrow leaves ($2n = 48, 56, 64$) has not been confirmed in the state.

HAB 4,6,9 D 3. **ABU** g9 s9 -3.

1982--Symphyotrichum racemosum (Ell.) Nesom

Asteraceae <Astereae>: Symphyotrichum <S-Dumosi> racemosum (A. fragilis/vimineus var. subdumosus)

This is a variable species ($2n = 16, 32$) of diverse damp open habitats, mostly in southeastern states (FNA 20, Y). In Ky. many plants have been referred to

var. *subdumosus* (Wieg.) Nesom, with a description that appears transitional to *S. lanceolatum* (e.g. F; see also Y). However, that taxon has not been recognized in most recent treatments.

Several atypical colls., including some formerly identified as "*A. vimineus* Lam." (from BATH, CAMP, GARR and ROWA), suggest hybrids with *lateriflorum*, *dumosum*, or *pilosum*. In general, *racemosum* appears intermediate between *lateriflorum* (sharing secund heads and relatively short rhizomes) and *dumosum* (sharing narrow glabrous leaves, much reduced upwards, and short disc corolla lobes); see Semple et al. (2002).

HAB f-9,6 D? 5. **ABU** g10 s8 -3.

1983--*Symphytotrichum praealtum* (Poir.) Nesom

Asteraceae <Astereae>: *Symphytotrichum* <S-Dumosi> *praealtum*
This variable ($2n = 32, 48, 64$), widespread, midwestern and northern species may have been often overlooked in Ky. It can be confused with *lanceolatum* (perhaps its closest relative), *lateriflorum* and other species; also, hybrids may be expected (FNA 20).

Most records from Ky. need to be checked, at least for variety. The colls. from GRAY (D. Pittillo #2598 at KY) and MADI (R. Jones #4157 at EKY) appear to be var. *praealtum*. More obscure reports indicating typical *praealtum* (M) come from Linney (1882; as *A. carneus* Nees), Pr (as *A. salicifolius* Ait.), and Wiegand (1933; citing a coll. of Short at GH that cannot be located). The colls. from CALL and MCRA (in catalog of R. Athey, check MEM) have been referred to var. *subasperum* (Lindl. in Hook.) Nesom, which is probably a distinct southwestern segregate.

HAB f-6,9? D 3. **ABU** g9 s4? -4.

1984--*Symphytotrichum dumosum* (L.) Nesom var. *coridifolium* new comb.

Asteraceae <Astereae>: *Symphytotrichum* <S-Dumosi> *dumosum* var. *coridifolium*

As currently circumscribed (FNA 20), *S. dumosum* is a highly variable species (with $2n = 16$ or 32), and further analysis is needed. In its strict sense, var. *dumosum* is centered in northern Appalachian regions and unknown in Ky. (F; J.C. Semple, pers. comm.). The widespread southeastern segregate, *A. dumosum* var. *coridifolius* (Michx.) Torr. & Gray, has been combined with typical *S. dumosum* in recent treatments. However, it does appear distinct and includes most *dumosum* in Ky. Var. *coridifolium* occurs mostly on open

grassy uplands with seasonally dry, acid soils. Although occasional hybridization and intergradation with other species has been suspected, there is no clear evidence of such processes in Ky.

HAB f-10,9,12 B 5. **ABU** g9? s9 -2?

1985--*Symphytotrichum dumosum* (L.) Nesom var. *strictior* (Torr. & Gray) Nesom R

Asteraceae <Astereae>: *Symphytotrichum* <S-Dumosi> *dumosum* var. *strictior*
This largely midwestern tetraploid ($2n = 32$) differs from var. *coridifolium* in its white to pale pink or bluish rays (versus usually bluish), generally shorter and less branched inflorescence, with more ascending branches, and its larger primary leaves, mostly 5-12 cm long and up to 11 mm wide (versus 3-5 cm long and up to 8 mm wide). It occurs mostly on damp lowlands and ponded sites, or occasionally on seasonally damp uplands, often with base-rich soils (Y, W). Var. *strictior* is widespread in Ind., Ill. and Mo., where there appears to be introgression with *racemosum* (Y), and it extends east to Appalachian regions from New England to N.C.

In Ky. var. *strictior* has been reported from CALL (Fuller 1980) and elsewhere (M), but verification is needed. A coll. from NELS (KY) appears to be this taxon: C.G. Gunn #2054, 18 Sep 1960, prairie patch on Ballard Farm, N of US 31E, on first lane S of Balltown. An unusually robust coll. from BELL (KY) may also be referred here: W. Meijer, 16 Oct 1982, Pine Mt. State Park.

1986--*Symphytotrichum dumosum* (L.) Nesom var. nov. {river bar form}

Asteraceae <Astereae>: *Symphytotrichum* <S-Dumosi> *dumosum* var. nov. {river bar form}

This taxon is known from rocky river banks in the Appalachian Plateaus of Tenn. and Ky., especially the upper Cumberland Rv. plus its tributaries, and the Obed-Emory Rv. It also occurs in W.Va. along the New Rv. and perhaps elsewhere (W.Va. Univ. herbarium).

These riparian plants differ from var. *coridifolium* in their relatively large heads, usually white rays (versus usually bluish), generally shorter flowering branches, more ascending leaves that remain relatively wide on flowering branches, and relatively short rhizomes. In these characters they generally resemble var. *strictior* (and were perhaps confused by Sm); both taxa appear to be tetraploids ($2n = 32$; J.C. Semple, pers. comm.). However, their heads

are distinctly larger, with involucre ca. 5-7 mm long (versus 3-5 mm). Moreover, they are disjunct from the largely midwestern var. strictior.

Their riparian habitat is similar to that of *S. tradescanti* (L.) Nesom, a northeastern diploid ($2n = 16$) that may be closely related. Similar biogeographic patterns occur in Eurybia (*saxicastellii* versus *radula*), *Solidago* Sect. *Maritimae* (*austrina* versus *uliginosa*), and *Solidago* Sect. *Humiles* (*arenicola* versus *racemosa*).

HAB 1 B 6. **ABU** g6? s6? -1.

1987--*Symphotrichum parviceps* (Burgess) Nesom R

Asteraceae <Astereae>: *Symphotrichum* <S-Porteriani> *parviceps* (A. pilosus ssp. pa.)

This small-headed species is centered in the Ozark region of Okl, Mo., Kans., Iowa and Ill. It is mostly diploid ($2n = 16$) but occasional polyploids ($2n = 32, 48$) have been found, especially to the northeast of its core range. A coll. from BULL (KY) appears to be this species, and appears similar to hexaploid colls. from further west (J.C. Semple, pers. comm.): C.R. Gunn #587, 24 Oct 1955, Bernheim Forest, path around Lake Nevin at Cove. Further investigation of this record is needed.

ALI w?

1988--*Symphotrichum pilosum* (Willd.) Nesom

Asteraceae <Astereae>: *Symphotrichum* <S-Porteriani> *pilosum* (var. p.) This variable weedy species is widespread across eastern North America; $2n = 32, 40, 48$. Several segregates have been treated as varieties or species, but distinction is difficult in some cases. See also notes under *parviceps*, *juniperinum* and *priceae*, which can be confused. Broad-leaved colls. (from CLAR, KENT, POWE, ROWA, SCOT and elsewhere) have been referred to var. *platyphyllum* Torr. & Gray, when treated in *Aster*, but that taxon has not been recognized in recent treatments (e.g. FNA 20).

S. pilosum and its allies (as listed above) all have inrolled phyllary tips, and leafy tufts are usually present at plant bases. Although this group (subsection *Porteriani*) is distinct from other "little white asters" (subsection *Dumosi*), hybrids can be expected, especially between *pilosus* and *lateriflorum* or *lanceolatum* (Semple et al. 2002, and pers. comm.).

HAB F-10,9 ::: D 5. **ABU** g10 s10 +3.

1989--*Symphotrichum juniperinum* (Burgess) new comb.

Asteraceae <Astereae>: *Symphotrichum* <S-Porteriani> *juniperinum* (*pilosum* var. *pringlei*; var. *demotus*)

This hexaploid ($2n = 48$) is known from most northeastern states (but not Iowa, Mo. or Tenn.), and includes *S. pilosum* var. *pringlei* (Gray) Nesom of some recent treatments (e.g. FNA 20). The only clear difference from typical *pilosum* is its largely glabrous condition; also, inflorescence branches tend to be more ascending and condensed (thyrsiform to subcorymbiform versus divergent to virgate-spreading in F). However, there is little documented intergradation and habitats are generally distinct. *S. juniperinum* is typical of dry calcareous sites, forming relatively large uniform populations.

More robust plants with larger heads predominate in Ky., and were previously treated by F and others as *A. pilosus* var. *demotus* S.L. Blake. Var. *pringlei* has generally smaller dimensions, but might just be an environmental phenotype associated with "alvars" and similar habitats further north (FNA 20). Further research is needed to determine if two taxa should be recognized.

S. juniperinum is most similar to two smaller-headed species: *S. depauperatum* (Fern.) Nesom, a rare diploid of serpentine glades from N.C. to Pa.; and the largely diploid *S. parviceps* (see above). It is also similar to the more southern octoploid, *S. priceae* (see below). But there is little overlap of ranges among these taxa, and although there is considerable variation within *juniperinum*, suspected introgression with other taxa has not been proven (J.C. Semple, pers. comm.).

HAB f-12,10 ::? D 5. **ABU** g8? s7? -2?

1990--*Symphotrichum priceae* (Britt.) Nesom

Asteraceae <Astereae>: *Symphotrichum* <S-Porteriani> *priceae* (A. kentuckiensis, *pilosus* var. *pr.*)

This rather poorly researched species (FNA 20) is known only from native grassland remnants and associated roadsides or old fields, on or near rocky limestone soils in disjunct localities of Ala., Ga., Tenn., Ky. and perhaps Ohio (GH: W.C. Werner, 1890, "near Painesville" in Lake Co.). In contrast to *pilosum* and *juniperinum*, *priceae* is typically octoploids ($2n = 64$) with relatively large bluish-violet to pink-purple rays (versus white or rarely colored), larger heads (with involucre usually 5.5-7.1 mm versus 3.5-5.1 mm), narrower leaves (the larger ones ca. 3-5 mm wide versus 5-15 mm), and mostly glabrous throughout (versus pilose to glabrous). It has been suggested that some plants with paler flowers and hairier leaves, including the type of

priceae (M), are hybrids with pilosum or juniperinum; the type of *A. kentuckiensis* Britt. is more clearly distinct.

HAB f-10,12 ::? D 5. **ABU** g5? s4? -5?

1991--*Symphytotrichum patens* (Ait.) Nesom var. *gracile* (Hook.) Nesom T

Asteraceae <Astereae>: *Symphytotrichum* <Virgulus> *patens* var. *gracile* (*A. tenuicaulis*)

Circumscription of var. *gracile* is not generally agreed on (J, FNA 20; Nesom 2006). It may be a diploid taxon concentrated on the Gulf Coastal Plain, characterized as having smaller mid-cauline leaves (3-5 cm long versus 5-7 cm), usually smaller heads (ca. 7-11 mm wide versus 9-12 mm), and shorter overall height (ca. 40-80 cm versus 80-160 cm). There are reports from w. Tenn. (Cr, FNA 20; but not Ch+), and several colls. from w. Ky. may also be referable to this taxon (e.g. from LOGA, TODD and TRIG at EKY). Older records from se. Ky. remain more dubious (B, F, M).

1992--*Symphytotrichum patens* (Ait.) Nesom

Asteraceae <Astereae>: *Symphytotrichum* <Virgulus> *patens* (var. p.)
Virtually all material of this variable (2n = 10, 20) southeastern species in Ky. may be referable to var. *patens* but further study is needed. See also notes under *phlogifolium*

HAB 12,10,11 B 4. **ABU** g10 s9 -3.

1993--*Symphytotrichum phlogifolium* (Muhl. ex Willd.) Nesom

Asteraceae <Astereae>: *Symphytotrichum* <Virgulus> *phlogifolium* (*A. patens* var. ph.)

This largely Appalachian taxon has been confused with *patens*, but it is generally considered to be a distinct species (Jones 1983). In Appalachian regions *patens* tends to be somewhat glandular, with relatively short inflorescence branches and disc corollas often purple-tipped. These characters might suggest some intergradation with *phlogifolium*; both taxa are tetraploids (2n = 20). Better documentation of true *phlogifolium* is needed along the western margin of its range.

HAB 11,5,7 C 3. **ABU** g8 s8 -2.

1994--*Symphytotrichum novae-angliae* (L.) Nesom

Asteraceae <Astereae>: *Symphytotrichum* <Virgulus> *novae-angliae*
This robust diploid (2n = 10) is widespread across eastern and central North America, except on the southeastern Coastal Plain. It can prosper on damp to

dry, fertile soils, especially in old fields, but it is greatly reduced by browsing animals. There is considerable variation in overall size, form, pubescence and flower color, and several selections are used in horticulture, but natural segregates have not been recognized in most treatments.

An unusual short, bushy, white-flowered variant with low seed production has been recently discovered growing wild in MADI (J. Perry, pers. comm.), and a relatively smooth, short, pinkish variant in HART (T. Barnes, pers. comm.). The latter is similar to cultivar "Alma Potschke" but seems to be spontaneous in a population with much variation in color. There may be rare hybrids with pilosum, which have been erroneously named *X amethystinum* (Nutt.) Nesom in Ky. (Short & Peter 1835; F, St, BA, M). That name applies to hybrids with *ericoides* (FNA 20).

HAB f-10,12,8,9? D 5. **ABU** g10 s9 -2?

1995--*Symphytotrichum oblongifolium* (Nutt.) Nesom

Asteraceae <Astereae>: *Symphytotrichum* <Virgulus> *oblongifolium*
This variable species (2n = 10, 20) is widely distributed from east-central states to the Great Plains but restricted to xeric rocky calcareous sites, usually in thin woods and small openings along bluffs. In Ky. most records are from extensive limestone cliffs along the Palisades of Kentucky Rv. (or tributaries) and along the western edge of the Appalachian Plateaus. It remains unknown within the Green Rv. watershed, but does occur further south along the Cumberland Rv. (Ch).

HAB 12 +\ E 5. **ABU** g9 s8 -1.

1996--*Symphytotrichum pratense* (Raf.) Nesom

Asteraceae <Astereae>: *Symphytotrichum* <Virgulus> *pratense* (*A. sericeum* var. *microphyllus*)

This diploid (2n = 10) occurs mostly in Tex. and La., but with scattered disjunct populations across southeastern states (Jones et al. 2008). It has been confused with the midwestern *S. sericeum* (Vent.) Nesom, which has been reported erroneously from Ky. (M) and Tenn. (Ch). Within Ky., *pratense* is known only from cedar glades in or near the Big Barrens region, and in the adjacent western Knobs.

HAB 12,10 D 5. **ABU** g7 s4 -3?

1997--*Symphytotrichum concolor* (L.) Nesom

Asteraceae <Astereae>: *Symphytotrichum* <Virgulus> *concolor* (var. c.)

This diploid ($2n = 8$) occurs on dry sandy soils in southeastern states east of the Mississippi Rv. In Ky. almost all records are from roadsides on or near sandstone outcrops in the southern Cliff Section of the Appalachian Plateaus. There are no records from nearby clifftops. The concolor group appears closely related to the pratense group, but there is striking divergence in relation to soil (acid versus basic). The concolor group has less branched stems, smaller leaves, smaller heads, and strigose seeds (versus glabrous); also $n = 8$ versus 10 (FNA 20).

HAB 12,10 A 5. **ABU** g8 s5 -4?

1998--Symphyotrichum ericoides (L.) Nesom R

Asteraceae <Astereae>: Symphyotrichum <Virgulus> ericoides
This ranges widely in northeastern and midwestern regions, with considerable variation; $2n = 10, 20, 30$. There are several reports from Ky. (M), but there has been much confusion with pilosum, racemosum or other species, especially using older treatments. *S. ericoides* is more closely related to pratense and concolor; its leaves are narrow but mostly sessile with a flared base. It is rare to absent in southeastern states (PL, W), but there is a coll. from Adams Co., Ohio (Miami Univ. herbarium), a county adjacent to LEWI, Ky.

HAB 12? ::? D? 5? **ABU** g10 s2? -4?

1999--Symphyotrichum divaricatum (Nutt.) Nesom

Asteraceae <Astereae>: Symphyotrichum <Astropolium> divaricatum (subulatum var. parviflorum, A. "exilis")

This is native to south-central states and Mexico, but generally considered adventive in southeastern states (W). It is a diploid ($2n = 10$) member of the complex based on *S. subulatum* Michx., which in its strict sense is largely restricted to salt-marshes along the Atlantic shores. The only Ky. record of *divaricatum* is a recent coll. from wet fields in FULT (EKY; Clark et al. 2005).

ALI S. **HAB** f-9,10? D 5. **ABU** g10? s2? -2?

2000--Doellingeria infirma (Michx.) Greene

Asteraceae <Astereae>: Doellingeria [Aster] infirma
This largely Appalachian species is widely scattered in Appalachian regions of Ky. There are a few records from further west along the southern Knobs or nearby, but these need verification.

The genus *Doellingeria* is a well established segregate of *Aster* (sensu lato). This and other loosely allied small genera--*Oclemana*, *Ionactis*, *Sericocarpus*--tend to have distinct species with uniform chromosome number: $2n = 18$ in all eastern taxa (FNA 20).

HAB 7,11 B 3. **ABU** g8 s8 -2.

2001--Doellingeria umbellata (P. Mill.) Nees

Asteraceae <Astereae>: Doellingeria [Aster] umbellata (var. u.)

This occurs on damp acid soils in much of eastern North America, but it is rare to absent on the southeastern Coastal Plain (where replaced by *D. sericocarpoides* Small). In Ky. *umbellata* occurs mostly in Appalachian regions. Its scattered occurrences in western regions deserve further documentation.

HAB 6,9 B 3. **ABU** g9 s8 -3.

2002--Oclemana acuminata (Michx.) Greene

Asteraceae <Astereae>: Oclemana [Aster] acuminata

This is restricted to cool damp woods from northeastern regions to higher elevations of the southern Appalachians. In Ky. it is known only from the Cumberland Mts.

HAB 5,4 B 2. **ABU** g9 s6 =.

2003--Ionactis linariifolius (L.) Greene

Asteraceae <Astereae>: Ionactis [Aster] linariifolius

This is widespread across eastern states but largely restricted to openings on xeric sandy soils. Although highly variable in leaf size, this distinct segregate of *Aster* (sensu lato) has no described varieties (W).

HAB 12,10 A 5. **ABU** g10 s8 -2.

2004--Sericocarpus asteroides (L.) B.S.P.

Asteraceae <Astereae>: Sericocarpus [Aster] asteroides (A. paternus)

This is widespread in Atlantic and southeastern states east of the Mississippi Rv., usually growing on dry acid soils. The rare hybrid with *linifolius* has been collected in LEWI and elsewhere (MM for WKY).

HAB 8,11,10 B 4. **ABU** g9 s8 -2.

2005--Sericocarpus linifolius (L.) B.S.P.

Asteraceae <Astereae>: Sericocarpus [Aster] linifolius (A. solidagineus)

The range of this species is similar to *asteroides*, in Atlantic and southeastern states east of the Mississippi Rv. It tends to occur in more open habitats on drier ground.

HAB f-10,12 B 5. **ABU** g9 s9 -3.

2006--*Baccharis halimifolia* L. W

Asteraceae <Astereae>: *Baccharis halimifolia*

This southern shrub used to occur mostly on the Coastal Plain until the 1990s, when it began to spread rapidly north across s. Tenn. and elsewhere in eastern states. Adventive plants often occur along major highway, especially where salted during the winter; global warming has also been implicated in the spread. The first record from Ky. was provided by D. Estes (pers. comm.) in MARS during 2008.

ALI s.

2007--*Boltonia diffusa* Ell.

Asteraceae <Astereae>: *Boltonia diffusa* (+ var. *interior*)

Varieties in this southeastern species have proven difficult to maintain (Y). Typical var. *diffusa* has been considered more southern and perhaps unknown in Ky. (but see Y and W). Plants known as var. *interior* Fern. & Grisc., including most or all Ky. colls., occur in the lower Mississippi Valley and on nearby uplands. *B. diffusa* has also been confused with *B. asteroides* var. *recognita*, and there may be some hybridization; both taxa are diploids, with $2n = 18$ (FNA 20, Y).

HAB f-9,2? ::: C? 6. **ABU** g7 s6? -4?

2008--*Boltonia asteroides* (L.) L'Hér. var. *recognita* (Fern. & Grisc.) Cronq.

Asteraceae <Astereae>: *Boltonia asteroides* var. *recognita* (*latisquama* var. r.)

Varieties in this southeastern species deserve close attention. The largely midwestern var. *recognita* is generally distinct from the more southern var. *asteroides*, but they have often been combined as varieties (FNA 20, Y, W); both are tetraploids ($2n = 36$). Var. *recognita* appears closer to the diploid var. *latisquama* (Gray) Cronq., which has a similar range but remains unknown in Ky. (FNA 20). Var. *recognita* has also been confused with *B. diffusa* (another diploid), and some records need to be rechecked.

HAB f-6,9? ::: D 6. **ABU** g9 s8 -3?

2009--*Erigeron pulchellus* Michx. var. *pulchellus*

Asteraceae <Astereae>: *Erigeron pulchellus* var. p.

This is a widespread eastern diploid ($2n = 18$) of medium acid soils, with one predominant variety.

HAB f-10,8,7 :: C 3. **ABU** g10 s9 -2.

2010--*Erigeron pulchellus* Michx. var. *brauniae* Fern.

Asteraceae <Astereae>: *Erigeron pulchellus* var. *brauniae*

This is generally distinct in appearance and habitat, being largely restricted to the wooded edges of sandy riverbanks along the Appalachian Cliff Section of Ohio, Ky. and Tenn.

HAB 4,1 :: C 3. **ABU** g7 s7 =.

2011--*Erigeron philadelphicus* L.

Asteraceae <Astereae>: *Erigeron philadelphicus*

This is widespread across temperate North America, mostly occurring on damp fertile soils in thin woods or more open habitats. Though varying much in overall dimensions, few segregates are recognized (FNA 20) and only diploids are known ($2n = 18$). In Ky. it flowers mostly during Apr-Jun, about the same time as *pulchellus* (or perhaps peaking 1-3 weeks later), but hybrids are unknown. A related midwestern species with smaller bluish heads, *E. tenuis* Torr. & Gray, has been reported from Ky., but its presence is dubious (M).

HAB f-10,7 :: D 4. **ABU** g10 s10 +1?

2012--*Erigeron strigosus* Muhl. ex Willd.

Asteraceae <Astereae>: *Erigeron strigosus* (*ramosus*; *annuus* ssp. s.)

Variation in this widespread North American species is complex and needs further study; there is a polyploid series ($2n = 18$ to 54) and many plants are apomictic (F, FNA 19, Y). Most colls. from Ky. are referable to the widespread weedy annual, var. *strigosus*.

Several colls. appear transitional to *E. annuus* (see also under that name), but may be referable to the more northern *E. strigosus* var. *septentrionalis* (Fern.) & Wieg.) Fern. A few colls. from western counties (CALL at OKL, HICK at MUR, OHIO at KY) are referable to the more southern var. *beyrichii* (Fisch. & C.A. Mey.) Torr. & Gray ex Gray. Several Appalachian colls. (from CART, ELLI, JOHN, MCRE, WHIT) at least tend towards to var. *discoidea* Robbins. Also to be expected is var. *calicicola* J. Allison, a slender perennial that has been recently described from limestone glades in n. Ala., nw. Ga. and c. Tenn., where it is locally abundant (Allison & Stephens 2001; W; D. Estes, pers. comm.).

HAB F-10,12 :: C 6. **ABU** g10 s10 +3.

2013--Erigeron annuus (L.) Pers.

Asteraceae <Astereae>: Erigeron annuus

This annual weed is widespread across temperate North America. In Ky. it may have been widespread before settlement, but increased greatly during the 1800s to become a major problem in hay-meadows and over-grazed pastures. It is not clear if there are records from Ky. earlier than 1914, when Gm considered it "introduced." Typical annuus is mostly triploid ($2n = 27$) and apomictic (FNA 19, Y). There is considerable variation and possible intergradation with *E. strigosus*, but varieties have not been widely recognized within annuus. Both species flower mostly during Jun-Sep in Ky.

HAB F-10 :: D 6. **ABU** g10 s10 +3.**2014--Conyza canadensis (L.) Cronq.**

Asteraceae <Astereae>: Conyza [Erigeron] canadensis (var. c.)

This weedy annual diploid ($2n = 18$) is widespread across North and Central America. As with the earlier flowering *Erigeron annuus*, *Conyza canadensis* appears to have increased greatly in Ky. to become a major problem after settlement. In 1914, Gm noted: "in cultivated ground and in grass land of almost any sort... often exceedingly common... difficult to get rid of because it is so prolific..."

HAB F-10 ::: D 6. **ABU** g10 s10 +3.**2015--Conyza parva Cronq.**

Asteraceae <Astereae>: Conyza [Erigeron] parva (canadensis var. pusilla*)

This close relative of *canadensis* has been recognized by several authors as a species or variety in southeastern states (W), extending up the Ohio Valley on sandy soils to se. Mo. (Y), s. Ind. and s. Ohio (PL). It is probably more widespread in Ky. than colls. indicate. It is locally abundant in fields and other openings on sandy uplands of MCRE and PULA.

HAB f-10 ::: C 6. **ABU** g10? s7? -1?**2016--Conyza ramosissima Cronq.**

Asteraceae <Astereae>: Conyza [Erigeron] ramosissima (E. divaricatus)

This widespread midwestern species can be confused with *canadensis*, and it may have been often overlooked. *C. ramosissima* differs in its smaller heads, 0.7-1 mm wide (versus 1-5 mm), and its low branched spreading habit, usually less than 25 cm tall (versus over 30 cm). It is rare in the Ohio Valley, where there are a few colls. from s. Ind. (D; M. Homoya, pers. comm.), s. Ohio (D. Boone, pers. comm.), Ky. (B; Harvill 1941, Cranfill 1991), and nw.

Tenn. (Ch; D. Estes, pers. comm.), but most date from before 1950. It was not mapped in Ky. or Tenn. by FNA 20.

HAB f-10 ::: C? 6. **ABU** g9 s6? -2?**2017--Bellis perennis L.**

Asteraceae <Astereae>: Bellis perennis

This is the common European "daisy" typical of short mowed lawns. It is locally introduced in more northern regions, but does not seem to be increasing within southeastern states (W).

ALI EU. **HAB** S-10 D 6. **ABU** +4.**2018--Astranthium integrifolium (Michx.) Nutt.**

Asteraceae <Astereae>: Astranthium [Bellis] integrifolium (var. i.)

Based on recent revision, this species is locally abundant in calcareous regions of c. Ky. and c. Tenn., plus scattered sites in c. Miss., ne. Ala., nw. Ga. and perhaps n. W.Va. (Nesom 2005, FNA 20; K, PL, W). Its original habitats may have been thin woodlands and grasslands maintained by seasonal flooding, browsing or drying. In Ky. it is mostly known from old rocky pastures and roadsides with late or irregular annual mowing. It is also frequent along the rocky banks of the Little South Fork (PULA, WAYN).

Rafinesque (1836, 2:23-24; Merrill 1949) described three taxa under *Bellis* from Ky., all of which can now be referred to *integrifolium*: (1) *parviflora* "on rocks, rare... very small half size of *B. integrifolia*"; (2) *nutans*, a more slender plant "in the glades of West Kentucky... flowers... same size as *B. integrifolia*, which grows by the millions in those glades, where I found them all in 1823"; (3) typical *integrifolia*, "All over the Western States... in glades."

Astranthium is a remarkable, largely southwestern genus of annuals or biennials with low chromosome numbers. There has been much confusion between *integrifolium* and the disjunct southwestern species, *A. ciliatum* (Raf.) Nesom; $2n = 8$ in both (Neson 2005; FNA 20).

HAB f-10,9,1? E 5? **ABU** g7 s7 -3.**2019--Achillea millefolium L. agg.**

Asteraceae <Anthemideae>: Achillea millefolium (sensu lato)

Although this variable, circumboreal weed has often been considered alien in eastern states (Gray 1864; Gm), most or all Ky. plants may be referred to the North American tetraploids ($2n = 36$) known as ssp. *lanulosa* (Nutt.) Piper, "with narrower leaf-segments disposed in various planes." The European

hexaploids ($2n = 54$) known as ssp. millefolium tend to have flatter, smoother, greener leaves (Cr). A practical treatment is still needed, based on the complex variation that has been revealed by molecular analysis (e.g. Guo et al. 2008; see also citations of W). There has been little attempt to subdivide the species in recent North American floras (e.g. FNA 19).

ALI m. **HAB** F-10 ::? D 5. **ABU** g10? s10? +3?

2020--*Leucanthemum vulgare* Lam.

Asteraceae <Anthemideae>: *Leucanthemum* [*Chrysanthemum**] *vulgare* (C. leucanthemum)

This somewhat ornamental but persistently rhizomatous weed has probably been present since early after settlement (Rafinesque 1824, Short 1840). In 1914, Gm noted: "very common and troublesome... Superintendents of parks and cemeteries are often very much afraid of it, and sometimes forbid visitors bringing the flowers..." Variation deserves further attention (Cr); $2n = 18$ usually but polyploids are known (as in several other Anthemideae). Most colls. from Ky. are referable to var. *pinnatifidum* (Lecoq & Lamotte) Moldenke, but that taxon has not been generally recognized in recent treatments.

ALI EU. **HAB** F-10,8 :: D 5. **ABU** +6.

2021--*Tanacetum parthenium* (L.) Schultz-Bip.

Asteraceae <Anthemideae>: *Tanacetum* [*Chrysanthemum*] *parthenium*

Although sometimes persistent after cultivation, this herb ("feverfew") may not be truly naturalized in Ky. The related species, *T. balsamita* L. ("costmary"), has also been reported from Ky. (BA), but probably from a planted source (M).

ALI EU. **HAB** H-10 ::? D? 6? **ABU** +4.

2022--*Tanacetum vulgare* L.

Asteraceae <Anthemideae>: *Tanacetum* [*Chrysanthemum*] *vulgare*

This commonly cultivated herb ("tansy") is naturalized across much of North America. In Ky. it is more or less naturalized at scattered old home sites and other residential localities. It was reported as "becoming naturalized" by Short & Peter (1835).

ALI EU. **HAB** H-10 ::? D? 6? **ABU** +4.

2023--*Anthemis arvensis* L.

Asteraceae <Anthemideae>: *Anthemis arvensis*

This widespread perennial weed has probably been present since early after settlement (Short et al. 1933). Most or all plants in Ky. are referable to var. *agrestis* (Wallr.) DC., but that taxon has generally not been recognized in recent treatments. *A. arvensis* has often been misidentified as *cotula*, and some records need to be rechecked. BA's report of *A. tinctoria* L. was based on misidentified *arvensis* (M).

ALI EU. **HAB** G-10 :::: D 6. **ABU** +4.

2024--*Anthemis cotula* L.

Asteraceae <Anthemideae>: *Anthemis cotula*

This cosmopolitan malodorous annual of barnyards and similar sites has probably been present in Ky. since early after settlement (Short et al. 1833). In the central Bluegrass, Short (1828-9) noted: "The road sides and waste grounds are every where covered with this obtrusive weed, which, originally introduced, has become quite too well known among us." Rafinesque (1836, 1:31) even expressed uncertainty about its naturalized versus native status in North America. Some colls. need to be rechecked for *arvensis*, which has been confused.

ALI EU. **HAB** G-10 :::: D 6. **ABU** +5.

2025--*Tripleurospermum inodorum* (L.) Sch. Bip.

Asteraceae <Anthemideae>: *Tripleurospermum* [*Matricaria*] *inodorum* (*perforatum*; *maritimum** var. i.)

This annual weed is widely scattered along roadsides in eastern states, but there is only one old record from Ky. (B at US). The closely related *T. maritimum* (L.) W.D.J. Koch is usually perennial and has a more northern (circumboreal) range, especially near coasts; $2n = 18$ and 36 in both taxa (FNA 19). The two taxa have been combined as varieties by some authors.

ALI EU. **HAB** G-10? :::: D? 6. **ABU** +4.

2026--*Matricaria chamomila* L. C

Asteraceae <Anthemideae>: *Matricaria chamomilla* (*recutita**)

This annual is the cultivated "chamomile"; it may rarely escape, but does not seem to be truly naturalized. There are colls. from HEND (KY), LAUR (KY) and JEFF (DHL). See FNA 19 for notes on the correct name.

ALI EU. **HAB** S-10 :::: D? 6. **ABU** +4.

2027--*Matricaria discoidea* DC.

Asteraceae <Anthemideae>: *Matricaria discoidea* (*matricarioides*)

This annual originated in western North America, but has become a common weed in temperate regions around the world; see notes on its status in FNA 19. It was not recorded in Ky. by Anderson (1947), B or earlier botanists, but became widespread mostly after 1970;

ALI W. **HAB** S-10 ::: D 6. **ABU** +6.

2028--*Artemisia vulgaris* L.

Asteraceae <Anthemideae>: *Artemisia vulgaris*

This is a widespread rhizomatous weed in humid temperate regions of North America. It is the most aggressive *Artemisia* in moist, fertile cultivated soils, forming dense leafy patches; $2n = 16$ (versus 18 in most other species). The earliest records from Ky. appear to be colls. of B in the 1930s (M). Although a persistent problem in gardens, it does not seem to spread much in the wild.

Colls. from GRAN, KENT and perhaps elsewhere are referable to var. *glabra* Ledeb., but that taxon has not generally been recognized in current treatments.

ALI EU. **HAB** H-10 ::? D 6? **ABU** +6.

2029--*Artemisia ludoviciana* Nutt.

Asteraceae <Anthemideae>: *Artemisia ludoviciana*

This is a widespread, variable rhizomatous species of western states, and it is a locally frequent adventive in some eastern regions. The few Ky. records date mostly from 1960-80 (M). The coll. from JEFF (DHL) is referable to var. *gnaphalodes* (Nutt.) Torr. & Gray, but that taxon has not been recognized in recent treatments.

ALI W. **HAB** R-10? ::? E? 6. **ABU** +4.

2030--*Artemisia pontica* L. W

Asteraceae <Anthemideae>: *Artemisia pontica*

This rhizomatous European species has sometimes been planted as an ornamental and has locally escaped. It may also be native to northeastern U.S.A. and adjacent Canada, but probably not Ky. (Cr, FNA 19). The only Ky. record is a coll. of R. Athey #1333, from along a "sandy fencerow" in BALL (EKY; check for accession).

ALI n.

2031--*Artemisia stelleriana* Bess. C

Asteraceae <Anthemideae>: *Artemisia stelleriana*

This rhizomatous perennial is sometimes grown for ornament (as "dusty miller" or "old woman"), and has spread along lake-shores and coasts in northeastern regions, but it does not seem to have become truly naturalized

in the Ohio Valley. The only Ky. record is a coll. from HICK, growing wild along a roadside in 1962 (EKY).

ALI AS.

2032--*Artemisia biennis* Willd.

Asteraceae <Anthemideae>: *Artemisia biennis*

Although this aggressive biennial weed from northwestern states is widely adventive in eastern states, there are only three old (1828-1937) records from Ky. (M).

ALI W. **HAB** G-10? ::: E? 6. **ABU** +4.

2033--*Artemisia annua* L.

Asteraceae <Anthemideae>: *Artemisia annua*

This annual weed may not have become widespread in eastern North America until after the mid-1800s, when Gray (1864) noted the range as just "Ind. to Kan." It was not recorded in Ky. until 1914, when Gm noted: "common locally along rivers and at the edges of cities elsewhere."

ALI EU. **HAB** G-10 ::: E 6. **ABU** +6.

2034--*Artemisia absinthium* L. C

Asteraceae <Anthemideae>: *Artemisia* <*Absinthium*> *absinthium*

This common "wormwood" is a subshrubby perennial that has long been cultivated for its biochemical properties, but it has only become widely naturalized in northern regions of North America (PL). It is unclear if the single coll. from Ky. (BALL at MUR) represents a wild population or a rare garden-escape.

ALI EU.

2035--*Gamochaeta argyrynea* Nesom T

Asteraceae <Gnaphalieae>: *Gamochaeta* [*Gnaphalium*] *argyrynea*

This southeastern segregate of *purpurea* was recently described by Nesom (2004; see also FNA 19). It does occur in Ky., but details have not yet been accumulated for mapping. *G. argyrynea* differs from *purpurea* in its smaller involucre (ca. 3-3.5 mm high versus 4-4.5 mm), with oblong-rounded to apiculate inner phyllaries (versus triangular-acute); and generally with more bisexual florets (usually 4-6 versus 3-4). Also, cauline leaves are just oblanceolate to obovate (versus often spatulate), and plants are rarely taprooted (versus often). It is often associated with frequently mowed areas.

HAB F-10 ::? C 5. **ABU** g8 s8 -1?

2036--*Gamochaeta purpurea* (L.) Cabrera

Asteraceae <Gnaphalieae>: *Gamochaeta* [Gnaphalium] *purpurea*
This weedy annual or biennial is widespread across North America, and various segregates can be recognized; $2n = 14$ and 28 . See notes under *argyrinea*.

HAB F-10 ::? C 5. **ABU** g10 s9 -1?

2037--*Filaginella uliginosa* (L.) Opiz

Asteraceae <Gnaphalieae>: *Filaginella* [Gnaphalium] *uliginosa*
This annual diploid ($2n = 14$) is generally considered to be a European weed, now widespread across northern states and southern Canada (Cr, FNA 20, W). B found this in Ky. at several sites, and considered it native in 1943, but the only subsequent Ky. record is a coll. of J. Thieret from KENT (KNK).

ALI n. **HAB** f-10,9,12? ::? C? 6? **ABU** g10 s6? -2?

2038--*Pseudognaphalium obtusifolium* (L.) Hilliard & Burt

Asteraceae <Gnaphalieae>: *Pseudognaphalium* [Gnaphalium] *obtusifolium*
Variation in this widespread eastern annual may deserve further study across its range, but only tetraploids ($2n = 28$) have been reported (FNA 20). Colls. at KY from ANDE, EDMO, FRAN, GARR, MONT and perhaps elsewhere are referable to var. *praecox* Fern. (as treated in *Gnaphalium*), which is concentrated on the southeastern Coastal Plain (F). However, that segregate does not now appear to be significant (Nesom 2001b). Colls. should also be rechecked for *P. microdenium*.

HAB F-10,7 ::? C 4. **ABU** g10 s10 -1?

2039--*Pseudognaphalium micradenium* (Weatherby) Nesom

Asteraceae <Gnaphalieae>: *Pseudognaphalium* [Gnaphalium] *micradenium* (*obtusifolium* var. *m.*, *helleri* ssp. *m.**)
This annual is widely scattered in northern, Appalachian and Ozarkian regions. It is distinct from the more southern *P. helleri* (Britt.) A. Anderb., as established by Nesom (2001b; see also FNA 19). It is also close to *obtusifolium*, and there has probably been some confusion. All Ky. records date from before 1950 (M), and most are colls. of B that should be rechecked.

HAB 11,8,10? ::? B? 3. **ABU** g8? s5? -2?

2040--*Antennaria solitaria* Rydb.

Asteraceae <Gnaphalieae>: *Antennaria solitaria*
This sexual diploid ($2n = 28$) is close to *plantaginifolia*, but largely restricted to east-central states in relatively mesic woods on acid soils (FNA 19, W).

HAB 7,5,10 B 3. **ABU** g8 s8 -3?

2041--*Antennaria plantaginifolia* (L.) Richards. var. *plantaginifolia*

Asteraceae <Gnaphalieae>: *Antennaria plantaginifolia* var. *p.*
See notes under *parlinii*. Both taxa are widespread stoloniferous plants in woodlands of eastern North America, and often confused. *A. plantaginifolia* is a sexual diploid of drier or more open habitats, on average, but there is little evidence of ecological difference. Curiously, Y did not recognize *plantaginifolia* in Mo., but reported *parlinii* and its ssp. *fallax* (including *ambigens*) across most of that state, within the same habitats.

HAB 11,7,10 C 2. **ABU** g10 s10 -2.

2042--*Antennaria plantaginifolia* (L.) Richards. var. *ambigens* (Greene) Cronq.

Asteraceae <Gnaphalieae>: *Antennaria plantaginifolia* var. *ambigens* (*parlinii* ssp. *fallax**)

Mapping here is provisional. This taxon is often included with *A. parlinii* ssp. *fallax* (Greene) Bayer & Stebbins, but appears somewhat intermediate between typical *plantaginifolia* and *parlinii* (Cr. FNA 19, W). It differs from typical *parlinii* in its basal leaves, with upper surfaces initially tomentose and "more tardily glabrate" (versus glabrous or nearly so even when young). Also, summits of young flowering stems are usually glandless (versus usually with purple glandular hairs). Further examination of colls. is needed to clarify the degree of distinction among these three or more taxa in Ky.

HAB 11,7,10 C 2. **ABU** g9? s7? -2.

2043--*Antennaria parlinii* Fern.

Asteraceae <Gnaphalieae>: *Antennaria parlinii* (*plantaginifolia* var. *arnoglossa*)

Mapping here is provisional. *A. parlinii* has been treated as an intergrading variety of *plantaginifolia* (Cr), with the most obvious difference being the glabrate or glabrous upper surface of its basal leaves (versus persistently tomentose). However, *parlinii* reportedly consists of largely apomictic, non-staminate polyploid plants ($2n = 56, 84, 70, 112$), with various hybrid origins from the diploids ($2n = 28$) *plantaginifolia*, *solitaria* and *racemosa* Hook. (FNA 19).

Although several colls. from Ky. have been determined by authorities as *parlinii* (e.g., from FLEM and LEWI at NCU), few if any have the distinctly longer involucre (7-13 mm long versus 5-7 mm) that are described in

manuals. Typical *parlinii* is also supposed to have longer staminate corollas (3.5-5 mm versus 2-3.5 mm) and pistillate corollas (4-7 mm versus 3-4 mm), and glandular upper stems. Several colls. (perhaps most) could be transferred to *plantaginifolia* var. *ambigena*; see notes under that name.

HAB 7,11 C 2. **ABU** g9 s9 -3.

2044--*Antennaria neglecta* Greene

Asteraceae <Gnaphalieae>: *Antennaria neglecta* (sensu lato)

Variation and nomenclature needs to be checked. The coll. from HARD (NCU) appears to be the typical sexual diploid ($2n = 28$), *A. neglecta*.

However, the colls. from BREC (KY), JEFF (DHL) and LAWR (Beyer & Stebbins 1987) may be the largely apomictic, non-staminate polyploid ($2n = 56, 84$), *A. neodioica* (including *A. neglecta* var. *attenuata* (Fern.) Cronq.). Cr treated the latter as *A. neglecta* var. *neodioica* (Greene) Cronq., but FNA 19 treated it as *A. howellii* Greene ssp. *neodioica* (Greene) Bayer. Both *neglecta* and *neodioica* are widespread in northern regions with no clear differences in habitat. *A. neodioica* tends have later flowering (in late May-July versus late April-June), shorter stolons, and more petiolate basal leaves.

HAB f-10,8,11 C 4. **ABU** g9 s5? -3?

2045--*Antennaria neodioica* Greene T

Asteraceae <Gnaphalieae>: *Antennaria neodioica* (*neglecta* var. n., *howellii** ssp. n.)

See notes under *neglecta*.

2046--*Anaphalis margaritacea* (L.) Benth. R

Asteraceae <Gnaphalieae>: *Anaphalis margaritacea*

This is a widespread variable northern (largely circumboreal) species that extends south to Va. along the higher mountains. It was reported by Huffaker (1975) from CART, but no coll. has been located. There are older records, but at least some of these appear to have been based on misidentified *Pseudognaphalium obtusifolium* (M). *A. margaritacea* is distinct in its rhizomatous habit (with deciduous lower leaves), papery white involucre and generally dioecious flowers, which appear in late summer (Cr, FNA 20); $2n = 26$ (versus 28 or more in most related Inuleae). It is sometimes grown for ornamental use (W).

2047--*Eutrochium purpureum* (L.) E.E. Lamont

Asteraceae <Eupatorieae>: *Eutrochium* [*Eupatorium**] *purpureum*

This is widely distributed in mesic woods of eastern states, especially from mid-Atlantic to midwestern regions. In Ky. all plants are probably typical *purpureum* (with $2n = 20$ as in other species of *Eutrochium*). Other variants may be recognizable to the west and north (F, FNA 21, W).

HAB 5,7 D 2. **ABU** g9 s9 -2.

2048--*Eutrochium steelei* (E. Lamont) E.E. Lamont

Asteraceae <Eupatorieae>: *Eutrochium* [*Eupatorium**] *steelei*

This glandular-hairy species of southern Appalachian mountains was described by Lamont (1990) as a segregate of *purpureum*. However, its degree of distinction remains unclear in Ky. Colls. from BELL and PIKE (DHL) appear somewhat intermediate.

HAB 5,7 C 2. **ABU** g6 s4 -1.

2049--*Eutrochium fistulosum* (Barratt) E.E. Lamont

Asteraceae <Eupatorieae>: *Eutrochium* [*Eupatorium**] *fistulosum*

This is widely distributed on damp soils in eastern states, except the upper mid-west. In Ky. it is rare to absent on more fertile calcareous soils, where intense browsing by groundhogs, deer and other animals appears to be a locally important factor, in addition to any presumed direct edaphic effect.

HAB f-9,2,1 C 4. **ABU** g9 s9 -1?

2050--*Eutrochium maculatum* (L.) E.E. Lamont

Asteraceae <Eupatorieae>: *Eutrochium* [*Eupatorium**] *maculatum*

This is a widespread variable northern species (FNA 21). The only records from Ky. are dated before 1950 (M). Colls. from "bank of the Ohio River" in CAMP (check PH) and "swamps near Louisville" in JEFF (Univ. of Cincinnati) are verified, but colls. have not been located to support the other records. W has suggested that plants of Southern Appalachian mountains, in forests on mesic acid soils (which might include any plants from HARL), may be distinct from more northern plants in base-rich wetlands. Similar shifts of habitat may occur within *Heracleum maximum*, *Cirsium muticum* and *Cypripedium parviflorum*.

HAB 9,7,10? D? 4? **ABU** g10 s1? -1?

2051--*Eupatorium serotinum* Michx.

Asteraceae <Eupatorieae>: *Eupatorium* <*Uncasia*> *serotinum*

This diploid ($2n = 20$) is widespread on wet medium-acid soils across eastern states, except those adjacent to Canada. See also *perfoliatum* for note on hybrids.

HAB f-9,10 C 4. **ABU** g10 s10 -2?

2052--Eupatorium perfoliatum L.

Asteraceae <Eupatorieae>: Eupatorium <Uncasia> perfoliatum

This diploid ($2n = 20$) occurs widely on wet fertile soils in eastern and central North America. Occasional hybrids with serotinum (X truncatum Muhl. ex Willd.) are scattered widely across east-central states (Tucker & Dill 1989), and have been found in MARI, NELS and ROWA (M). These hybrids include plants named E. perfoliatum var. cuneatum Engelm. & Gray or, misleadingly, E. resinsum Torr. var. kentuckiense Fern.

HAB f-9,2 D 5. **ABU** g10 s10 -3.

2053--Eupatorium album L.

Asteraceae <Eupatorieae>: Eupatorium <Uncasia> album

This generally diploid species ($2n = 20$) is widespread on dry acid soils across southeastern states east of the Mississippi Rv., and disjunct in Ark. All plants in Ky. probably match var. glandulosum (Michx.) DC. but that segregate may not be worth recognizing (see also W). The more southern var. album (sometimes misnamed "E. petaloideum Britt."), with less glandular involucre, has been reported but does not appear to occur in Ky. (M). A few colls. may be hybridized with torreyanum (HART at TENN, MCRE at KY), sessilifolium or other species; see also notes under vaseyi.

HAB 10,8 B 5. **ABU** g8 s8 -3.

2054--Eupatorium vaseyi Porter T

Asteraceae <Eupatorieae>: Eupatorium <Uncasia> vaseyi (album var. vaseyi; monardifolium)

This name has been applied to apomictic polyploids ($2n = 30$) with probable origin from hybrids of typical album with either sessilifolium or other species (FNA 21, W). These plants occur mostly in or near southern Appalachian regions. There has been confusion with godfreyanum; see notes under that name. There are only a few tentative records of vaseyi from Ky.: a coll. of R. Athey from CALL (Florida State Univ., TENN) det. by R.K. Godfrey; Cranfill's (1990) record from HARD; and B's records of var. monardifolium Fern. from EDMO and GRAY.

2055--Eupatorium sessilifolium L.

Asteraceae <Eupatorieae>: Eupatorium <Uncasia> sessilifolium

This is widespread in dry woods on medium acid soils from mid-Atlantic to midwestern states. It varies in ploidy ($2n = 20, 30$), and there appears to be

occasional hybridization with album and pubescens. See also comments under godfreyanum regarding possible recognition of E. sessilifolium var. brittonianum.

HAB 11,7 C 3. **ABU** g9 s9 -2.

2056--Eupatorium X godfreyanum Cronq. T

Asteraceae <Eupatorieae>: Eupatorium <Uncasia> X godfreyanum ("vaseyi")

This name has been applied to a series of apomictic polyploids ($2n = 30, 40$) derived from hybridization of pubescens and sessilifolium (FNA 21). However, colls. from Ky. with this name might be better treated as the relatively northern E. sessilifolium var. brittonianum Porter. The name E. godfreyanum should perhaps be restricted to more eastern plants, especially in Va. (W). The Ky. colls. are from FLEM (B), LEWI (B) and ROWA (R.K. Godfrey #70017 at TENN); the latter was determined not to produce pollen. This small cluster of records in the northeastern Knobs region does suggest a distinct taxon. The colls. were initially named E. vaseyi Porter in error; see notes under that name.

2057--Eupatorium pilosum Walt.

Asteraceae <Eupatorieae>: Eupatorium <Uncasia> pilosum (verbenaefolium, rotundifolium var. saundersii)

This southeastern species (up the Atlantic Coast to Mass.) includes a polyploid series ($2n = 20, 30, 40$), and may be derived from hybridization of rotundifolium and album (FNA 21). It appears distinct in Ky. and elsewhere (W), with concentration on relatively wet sites.

HAB 9 B 5. **ABU** g8 s7 -4.

2058--Eupatorium rotundifolium L. T

Asteraceae <Eupatorieae>: Eupatorium <Uncasia> rotundifolium (var. r.)

This has been redefined in recent decades as a southeastern species that includes sexual diploids ($2n = 20$) restricted to Ga. and Fla., plus apomictic polyploids ($2n = 30$) that extend north at least to Ark., Tenn. and Va. (FNA 21). Further research is needed into distinction and distribution of taxa within the rotundifolia group. Some colls. of pubescens from Ky. (as also noted by B) suggest transitions to typical rotundifolium, especially in southeastern counties (MCRE, WAYN, WHIT). But although typical rotundifolium has been reported from Ky. (M, FNA 21), no verified colls. have been located.

2059--Eupatorium pubescens Muhl. ex Willd.

Asteraceae <Eupatorieae>: *Eupatorium* <Uncasia> *pubescens* (rotundifolium var. ovatum*)

This largely northeastern and Appalachian species is generally distinct from the more southern rotundifolium (F, FNA 21, W), but it has often been treated as a variety (Cr). *E. pubescens* appears to be an apomictic allopolyploid (mostly with $2n = 30$), derived from rotundifolium and perhaps sessilifolium (FNA 21). There may be some intergradation between *pubescens* and rotundifolium across their ranges (F, Cr), as suggested by some colls. from Ky. (e.g. B).

HAB 10,9 B 4. **ABU** g9 s9 -3.

2060--*Eupatorium semiserratum* DC.

Asteraceae <Eupatorieae>: *Eupatorium* <Uncasia> *semiserratum* (cuneifolium var. s.)

This diploid ($2n = 20$) occurs in southeastern states, mostly on the Coastal Plain. In Ky. it is known only from one patch along banks of the Cumberland Rv. in WHIT, plus an unverified report by Pr from WARR. In addition, Woods & Fuller (1988) reported the related species, *E. lancifolium* (T. & G.) Small (= *E. semiserratum* var. *lancifolium*), based on R. Athey #2910 (MUR) from CALL. However, the coll. has not been relocated, and *lancifolium* is known mostly from s. Ark., n. La. and e. Tex. Reports indicating another allied species, *E. glaucescens* Ell. (= *cuneifolium* Willd., misapplied), appear to have been erroneous (M).

HAB 9,1? B 5. **ABU** g9 s2 -3?

2061--*Eupatorium altissimum* L.

Asteraceae <Eupatorieae>: *Eupatorium* <Uncasia> *altissimum*

This is a widespread variable species in eastern states, most common on base-rich soils in the midwest. In Ky. *altissimum* is most abundant on calcareous soils, but it does occur locally on non-calcareous soils or highly leached calcareous soils. Chromosome numbers deserve further investigation; $2n = 20, 30$ and 40 across its range. Also hybrids with *serotinum* and *hyssopifolium* can be expected (FNA 21, Y).

HAB f-12,10 D 5. **ABU** g10 s9 -3?

2062--*Eupatorium hyssopifolium* L.

Asteraceae <Eupatorieae>: *Eupatorium* <Uncasia> *hyssopifolium* (including var. *calcaratum*)

Following W, *hyssopifolium* is variable species ($2n = 20, 30$) that includes var. *calcaratum* Fern. & Schub. (sometimes misnamed "*E. linearifolium*

Walt."). The latter appears superficially to be a narrow-leaved extreme (FNA 21). Colls. referred to var. *hyssopifolium* in its strict sense (F) appear to be intermediate between var. *calcaratum* and *E. torreyanum*, and mostly come from southeastern counties (BARR, LAUR, MCRE, PULA). A thorough review of colls. from Ky. is needed, partly to see if narrow-leaved plants have been spreading north during recent decades, as in Mo. (Y). The first records from Ky. that are referable to var. *calcaratum* date from the 1940s (M).

HAB f-10 B 5. **ABU** g10? s8? -3.

2063--*Eupatorium torreyanum* Short & Peter

Asteraceae <Eupatorieae>: *Eupatorium* <Uncasia> *torreyanum* (*hyssopifolium* var. *laciniatum**)

This distinct species (W) occurs in southeastern states east of the Mississippi Rv. It is probably derived from hybrids of *hyssopifolium* with another species, perhaps *semiserratum* (Cr, FNA 21). It is mostly tetraploid ($2n = 40$), whereas *hyssopifolium* includes just triploids ($2n = 30$) and diploids ($2n = 20$).

HAB f-10,9 B 5. **ABU** g8 s8 -3?

2064--*Eupatorium compositifolium* Walt. W

Asteraceae <Eupatorieae>: *Eupatorium* <Traganthes> *compositifolium*

This southeastern weed of sandy soils is a rare waif in Ky. and Tenn. (Ch). The only Ky. record is a coll. of MM from horticultural plantings in JEFF, at the Univ. of Louisville during 1991-92.

2065--*Eupatorium capillifolium* (Lam.) Small

Asteraceae <Eupatorieae>: *Eupatorium* <Traganthes> *capillifolium*

This is an abundant weed in more southeastern states, but just an uncommon waif in Ky. The mapped records here generally come from wild contexts. In addition, the species has been observed occasionally in horticultural situations where it has been introduced with imported potted plants. See also note under *compositifolium*, which is closely related ($2n = 20$ in both). Without mature flowers, these filifolious plants have a superficial resemblance to some species of *Artemisia* and even *Amaranthaceae* (sensu lato).

ALI s. **HAB** H-10 ::: C 6. **ABU** g9 s5? -1?

2066--*Fleischmannia incarnata* (Walt.) King & H.E. Robins.

Asteraceae <Eupatorieae>: *Fleischmannia* [*Eupatorium*] *incarnata*

This distinctive diploid ($2n = 20$) is widespread across southeastern states, but with a fragmented range and largely restricted to relatively fertile soils. In Ky. it is scattered across western and south-central regions but generally

uncommon and sporadic. An unusually large population in central Ky. occurs at the Buckley Hills Sanctuary in WOOD, where deer browsing is especially intense.

HAB f-8,10 ::? D 4. **ABU** g9 s8 -3.

2067--Conoclinium coelestinum (L.) DC.

Asteraceae <Eupatorieae>: Conoclinium [Eupatorium] coelestinum
This rhizomatous diploid (2n = 20) is widespread on damp soils in eastern states except those adjacent to Canada. In Ky. it is locally abundant in pastures with infrequent mowing.

HAB f-9,10 :: D 4. **ABU** g10 s10 -2?

2068--Ageratum conyzoides L. C

Asteraceae <Eupatorieae>: Ageratum conyzoides
This commonly cultivated species has been collected from ADAI (FI; Gibson 1971).

ALI SA.

2069--Ageratina aromatica (L.) Spach

Asteraceae <Eupatorieae>: Ageratina [Eupatorium] aromatica
This occurs widely in southeastern states east of the Mississippi Rv., but it is largely restricted to dry acid soils.

HAB 11,7,10 B 3. **ABU** g8 s8 -2.

2070--Ageratina altissima (L.) King & H.E. Robins.

Asteraceae <Eupatorieae>: Ageratina [Eupatorium] altissima (E. rugosum, urticaefolium)

This is widespread on damp fertile soils of eastern North America, especially in thin woods with a long history of browsing. It is highly variable across its range, but segregates are mostly rather indistinct; 2n = 34 in all reports (as in other Ageratina species). Some relatively pubescent colls. from Ky. have been identified as var. tomentellum (B.L. Robbins.) Blake (from BULL), or as forma villicaula Fern. (from NELSON, OWEN, WHIT). However, these taxa are not recognized in recent treatments. A few colls. from the Cumberland Mts. may tend towards var. roanensis; see below.

HAB 7,5,11,4 D 3. **ABU** g10 s10 -3.

2071--Ageratina altissima (L.) King & H.E. Robins. var. roanensis (Small) Clewell & Woot. T

Asteraceae <Eupatorieae>: Ageratina [Eupatorium] altissima var. roanensis (E. rugosum var. r.)

This occurs mostly in the Blue Ridge Mts, and Clewell & Wooten (1971) noted: "grading into var. altissima at lower elevations and in peripheral geographic areas." A coll. from HARL (widely distributed, with a duplicate at MDKY) has been assigned to this variety by Clewell & Wooten: F.T. McFarland #29, 28 Sep 1940, Black Mt. top, common in woods. Also, a coll. of T.H. Kearney from BELL (NCU) has been labeled with this name. These plants do not seem to be as distinct as var. roanense in the Blue Ridge (M).

2072--Ageratina luciae-brauniae (Fern.) King & H.E. Robins.

Asteraceae <Eupatorieae>: Ageratina [Eupatorium] luciae-brauniae (deltooides ined.)

Although locally common, this species is known only from sandstone rockhouses in the central Cumberland Plateau of Ky. and Tenn. (in Fentress, Pickett, Scott & Morgan Cos.; Ch).

HAB 5 // B 2. **ABU** g5 s6 =.

2073--Mikania scandens (L.) Willd.

Asteraceae <Eupatorieae>: Mikania scandens
This twining vine is pantropical and widespread on lowlands in warmer regions of southeastern and east coastal states. It is largely unknown in the Ohio Rv. watershed upstream of the Shawnee Hills, but there is a disjunct population in se Ind. (M. Homoya, pers. comm.) and a dubious old record from sw Ohio (D. Boone, pers. comm.).

HAB 9,6,2 D 4. **ABU** g9 s8 -3.

2074--Brickellia eupatorioides (L.) Shinnery var. eupatorioides

Asteraceae <Eupatorieae>: Brickellia <Kuhnia> eupatorioides var. e.
Typical eupatorioides has a broad southeastern range, while var. corymbulosa is centered in the Great Plains (FNA 21). Var. corymbulosa has relatively large heads and inflorescences, but may not be clearly distinct in Ky. and other areas of overlap (e.g. Y). Further analysis is needed. In Ky. Brickellia mostly occurs on somewhat base-rich soil, unlike most Eupatorium (except altissimum). It is a more western genus in general, distinguished by its alternate (versus opposite) leaves and 10-ribbed cypselas (versus 5-ribbed); 2n = 18 (versus 20 + multiples).

HAB f-10,12 D 5. **ABU** g9 s9 -2?

2075--*Brickellia eupatorioides* (L.) Shinnery var. *corymbulosa* (Torr. & Gray) Shinnery

Asteraceae <Eupatorieae>: *Brickellia* <*Kuhnia*> *eupatorioides* var. *corymbulosa*

See notes under var. *eupatorioides*.

HAB f-10,12? D? 5. **ABU** g9 s8 -2?

2076--*Liatris squarrosa* (L.) Michx.

Asteraceae <Eupatorieae>: *Liatris squarrosa* (var. s.)

This widespread southeastern species is the most common *Liatris* in Ky., but still uncommon to rare in most regions. Especially in eastern regions, it appears to be a somewhat conservative remnant of open woodland or grassland. See also notes under *cylindracea* and *hirsuta*, which are closely related to *squarrosa*. These short species tend to flower earlier than other species in the genus, mostly in July-Aug.

HAB f-10,12 C 5. **ABU** g9 s7 -3.

2077--*Liatris hirsuta* Rydb. T

Asteraceae <Eupatorieae>: *Liatris hirsuta* (*squarrosa* var. h.)

This largely midwestern species, or variety of *squarrosa*, is reportedly disjunct further east from Miss. to Ga. (Gaiser 1946; F, Cr, FNA 21, Y, W). It may also occur in western regions of Tenn. and Ky., but colls. that have been called var. *hirsuta* (Rydb.) Gaiser in Ky. are generally not distinct from typical *squarrosa* based on recent treatments. Phyllaries of *hirsuta* mostly have abruptly contracted apices (versus usually more tapering); outer ones are relatively short and spreading-reflexed for only 0-2 mm (versus equalling or longer than inner ones). Hairs on leaves and stems of *hirsuta* are relatively straight and spreading; those on typical *squarrosa* are "bent or curled, appressed to loosely matted" (Y). More densely hairy plants in Ky. are scattered with the moderately hairy plants of typical *squarrosa*, with no clear difference in distribution, and they are combined here pending further analysis.

2078--*Liatris cylindracea* Michx.

Asteraceae <Eupatorieae>: *Liatris cylindracea* (*squarrosa* var. *intermedia*)

In Ky. this species of the upper midwest is known only from a few sites around the Big Barrens region and in foothills of the northeastern Knobs. *L. cylindracea* is generally glabrous, but some plants in Ky. are hairy, suggesting introgression with *squarrosa* (Cusick 1989; FNA 21). Apparent intermediates

between these species are also locally frequent in some glades of Tenn. (TENN), Ala. (Allison & Stephens 2001) and Ga. (M. Medley, pers. comm.). **HAB** 12 + E 6. **ABU** g8 s4 -2?

2079--*Liatris spicata* (L.) Willd.

Asteraceae <Eupatorieae>: *Liatris spicata*

This is widely scattered from southeastern to midwestern states, but generally restricted to damp soils in remnants of native grassland. Hybrids with several species can be expected (FNA 21, Y); *spicata* has peak flowering usually in Aug-Sep, after *squarrosa* and before the *aspera* group. Some colls. from MCRA and ROWA appear to be hybrids with *aspera*; see notes under that species. Hybrids with *squarrosa* have been rarely found in Tenn. (TENN) and Miss. (MISS), but are unknown in Ky.

HAB 10,9 C 5. **ABU** g10 s7 -4.

2080--*Liatris microcephala* (Small) K. Schum.

Asteraceae <Eupatorieae>: *Liatris microcephala* ("graminifolia")

Within Ky. this southern Appalachian species is known only from xeric sandy soils in the southern Cliff Section (Palmer-Ball et al. 1988). In addition to rocky ridges and clifftops, its habitats include "boulder-bars" along Big South Fork of Cumberland Rv. and other tributaries, where plants have unusually narrow leaves. It has peak flowering usually in Aug-Sep. Records from MENI and WARR are unverified and dubious (M).

The name *L. graminifolia* Willd. was misapplied to these plants in some older literature from Ky. Also, reports of *graminifolia* from FLEM (MO) and ROWA (MDKY) were apparently based on misidentified *spicata* or erroneous label data (Campbell et al. 1992). *L. graminifolia* is now considered a synonym of *L. pilosa* (Ait.) Willd., which occurs mostly on the Atlantic Coastal Plain and Piedmont, but does extend into the mountains of W.Va. (W). **HAB** 12 + A 6. **ABU** g7 s7 -1.

2081--*Liatris pycnostachya* Michx. R

Asteraceae <Eupatorieae>: *Liatris pycnostachya*

This species of damp prairies in midwestern regions has been attributed to Ky. by Cr and other authors (FNA 21), apparently based on the old coll. of C.W. Short (NY) labeled "barrens of Ky." (det. by L.O. Gaiser). This record might reasonably be mapped in CHRI or nearby. There is also a coll. of R. Athey from CALL (check EKY) that may be this species or more likely a transition to *spicata* (M). Both colls. need to be reexamined.

2082--*Liatris squarrulosa* Michx.

Asteraceae <Eupatorieae>: *Liatris squarrulosa* (earliei, scabra; scariosa var. sq.)

This is a variable southeastern species that may introgress with other species (Cr, Y), especially *L. aspera* (see notes under that species) and locally *L. scariosa* (L.) Willd. Hybrids are relatively frequent within this genus, which has a consistent chromosome number; $2n = 20$ in virtually all reports. However, no simple hybrids of *squarrulosa* appear to have been named (FNA 21). Relatively hairy plants, formerly known as *L. scabra* (Greene) K. Schum., are included here.

There has been confusion with typical *scariosa*, which appears somewhat transitional from *squarrulosa* to *aspera*. *L. scariosa* occurs further east in Appalachian regions, especially around the shale-barrens of Pa., Md., W.Va. and Va.; reports from Ky. are erroneous (M).

HAB 10,12 C 5. **ABU** g8 s7 -4.

2083--*Liatris aspera* Michx.

Asteraceae <Eupatorieae>: *Liatris aspera*

This is widely scattered across central North America, but rare to absent in Appalachian and Atlantic regions. It is largely restricted to remnants of native grassland, usually on more base-rich soils than *squarrulosa*. *L. aspera* is variable and can hybridize with several other species, with six named in FNA 21; see also notes under *X spherioidea*. Relatively glabrous plants in Ky. have been named var. *intermedia* (Lunell) Gaiser, especially in older treatments, but are generally mixed with the typical variety and have no clear difference in distribution. Hairy plants (var. *aspera*) have a more western range in North America, but there is often too much overlap and intergradation for clear distinction (FNA 21).

There has been confusion with *squarrulosa*; both species have peak flowering usually in Sep (-Oct). Local introgression has been suspected in Ky. (especially in more western regions) and in Mo. (Y), but this was not reported in FNA 21. The only consistent observable difference between these two species is that the middle phyllaries of *squarrulosa* are glabrous to hirtellous, with margins usually firm to somewhat coriaceous, and green to whitish. In *aspera*, middle phyllaries are glabrous, the margin hyaline and erose to irregularly lacerate, often purplish (see also: Cr).

HAB 10,12 D 5. **ABU** g9 s7 -4.

2084--*Echinacea purpurea* (L.) Moench

Asteraceae <Heliantheae>: *Echinacea* (*Brauneria*) *purpurea*

As a native plant, this diploid ($2n = 22$) is largely restricted to midwestern and Ozarkian regions, usually growing in thin woods and edges on submesic to subxeric, base-rich soils. In Ky. it is concentrated along the western edge of Appalachian regions, and around the northern karst plain of the Mississippian Plateaus. *E. purpurea* is generally uncommon in the wild, and it appears to be a remnant of brushy or grassy openings on relatively deep soil where farmland predominates or where the woods have become excessively shady. But it is also planted frequently as a "wildflower" and some records from roadsides in parks or in supposedly "restored" areas may come from such introductions.

HAB f-10,7,12 D 4. **ABU** g8 s7 -5.

2085--*Echinacea simulata* R.L. McGregor

Asteraceae <Heliantheae>: *Echinacea* (*Brauneria*) *simulata* (*pallida* var. s.*)

This occurs only in calcareous glades of the Interior Low Plateaus and Ozark Region or nearby (FNA 21, Y). It was formerly included within *E. pallida* (Nutt.) Nutt., which has a more western and southern range, often on deeper soils. *E. pallida* is tetraploid ($2n = 44$ versus 22 in *simulata*); its pollen is larger and white (versus yellow when fresh), and there are other subtle differences. Another western taxon in this complex, *E. angustifolia* DC., has also been erroneously reported by BA from Ky. (M).

HAB 12 D 5. **ABU** g7 s7 -4.

2086--*Rudbeckia fulgida* Ait. var. *fulgida*

Asteraceae <Heliantheae>: *Rudbeckia fulgida* var. f. (?*spathulata*, ?*acuminata*, ?*palustris*)

R. fulgida has been defined in a narrow (Sm, F) or broad (Cr, FNA 21) sense; a moderate approach is adopted here. Within the *fulgida* complex, $2n = 38$ (as in most species of *Rudbeckia*) and 76. Var. *fulgida* is widespread in southeastern states on medium-acid soils, and it is scattered across Ky. on non-calcareous soils. A few Ky. colls. have been tentatively segregated here as var. *spathulata* or var. *palustris*; see notes under those names. There has also been much confusion with *umbrosa*, *tenax* and other species. *R. fulgida* may intergrade with *tenax*, especially along roadsides and other disturbed area.

HAB f-9,10 B 5. **ABU** g8? s8? -3?

2087--*Rudbeckia fulgida* Ait. var. *spathulata* (Michx.) Perdue T

Asteraceae <Heliantheae>: *Rudbeckia fulgida** var. *spathulata*

This appears to be widespread in states to the south and east of Ky. (GH, NY), especially on lowlands but perhaps mostly on xerohydric sites. Further work is need to clarify the degree of distinction from typical *fulgida*. For Ky. there are only a few somewhat tentative records of var. *spathulata*, from CASE (EKY) and MCRE (TENN); the report by Kearney (1893) was based on a coll. from BELL (MO) that is referable to var. *palustris*. Following Sm, F and other authors, var. *spathulata* may be distinguished primarily by its leaves, which are relatively narrow or spatulate (with "conspicuously dilated blade"); also, its flowering heads are generally smaller.

2088--*Rudbeckia fulgida* Ait. var. *palustris* (Eggert ex C.L. Boynt. & Beadle) Perdue

Asteraceae <Heliantheae>: *Rudbeckia fulgida** var. *palustris* (?*acuminata*, ?*chapmanii*)

Mapping here is provisional. This largely Ozarkian taxon differs from typical *fulgida* in its relatively broad leaves, the lower ones with much longer petioles (usually 10-15 cm versus 3-5 cm); also, plants tend to be less hairy. But its degree of distinction needs further attention (FNA 21; J. Campbell, in prep.). Colls. mapped here with more confidence are mostly from southeastern counties (BELL, MCRE, PULA). Other colls. appear generally atypical and perhaps transitional in some cases to typical *fulgida* (TRIG) or *umbrosa* (CALD, CALL, BULL).

R. acuminata C.L. Boynt. & Beadle is tentatively included here, but may be a distinct taxon closer to var. *fulgida*. F (following Sm) indicated that *palustris* occurs in "damp or wet places, Ind. to Mo. and Tenn."; and that *acuminata* occurs in "woods and banks of streams, Ky. and Tenn." With this inclusion, var. *palustris* would be widely scattered in east-central states but still concentrated in the Ozark region (based mostly on colls. at GH, MO, NCU, NY and US).

HAB C? 4? **ABU** g8? s4? -3?

2089--*Rudbeckia umbrosa* C.L. Boynt. & Beadle

Asteraceae <Heliantheae>: *Rudbeckia umbrosa* (*fulgida* var. u.*)

This largely southern Appalachian species is distinct but close to typical *fulgida*. Its leaves are distinctly broader, with truncate-subcordate bases at least low on stems, and have more prominent teeth (projecting 1-2 mm versus 0-1 mm); rays tend to be larger, but not as a clearcut character. *R. umbrosa* is largely restricted to mesic shady sites, and has also been confused with

speciosa in some treatments; better keys are needed (J. Campbell, in prep.). Sm and F accepted *umbrosa* as a species, but Cr treated *umbrosa* as a variety, with notes such as "growing near var. *fulgida* but without apparent intergradation" (Cronquist #4040 at NY. from Highland Co., Ohio).

Extensive examination of colls. from Ky. and elsewhere has revealed virtually no intermediate plants between *umbrosa* and typical *fulgida*. Some colls. from more open banks of the Cumberland Rv. and its Big South Fk. tend to have relatively narrow leaves, suggesting transitions to *fulgida*, but they may just be robust plants of *umbrosa* that lack basal leaves in the colls. A few disjunct colls. in western regions have suggested *umbrosa*, but may be closer to *fulgida* var. *palustris*; these include colls. from CALL (NCU) and CALD (KY).

HAB 7,4 B 3. **ABU** g8 s8 -2.

2090--*Rudbeckia truncata* Small

Asteraceae <Heliantheae>: *Rudbeckia truncata* {suggested: *fulgida** var. t.} Sm treated this as a species along with other segregates of *fulgida*, and a modified version of his treatment is accepted here (J. Campbell, in prep.). *R. truncata* is close to *missouriensis* (see notes under that name), but generally distinct in its dense clumps, long narrow basal leaves, narrow truncate cauline leaves, general paucity of hairs, and eciliate bracts of disc florets.

Ky. plants are quite similar to the type (NY): J.K. Small, 6-12 Aug 1895, along the Chickamauga Creek near Ringgold, Catoosa Co., Ga. Small (1898) noted that *truncata* occurs "in the northwestern and little explored part of [Ga.]... quite common in the limestone districts". B's coll. (NY, #2630, 8 Sep 1939) from Cox Bend in PULA was annotated by Cronquist as "correctly identified with *R. truncata* but no more than a variety, at best, of *R. fulgida*." The species also should be searched for in Ala. and Tenn. along limestone cliffs around the southern Cumberland Plateau and Ridge & Valley region.

HAB 12 +\ E 5. **ABU** g5 s5 -1.

2091--*Rudbeckia missouriensis* Engelm. ex C.L. Boynt. & Beadle T

Asteraceae <Heliantheae>: *Rudbeckia missouriensis* (*fulgida* var. m.)

This largely Ozarkian species is not verified east of the Mississippi Rv. except in s. Ill. It has been reported from Ky. in FNA 21 and other literature, but no convincing colls. have been seen (M). *R. missouriensis* appears to differ from *truncata* mainly in its denser pubescence, relatively narrow leaves, and more ascending branches. Plants referable to either taxon should be searched for

further within intervening regions. Somewhat hairy plants from JESS (overlook near Camp Nelson) have suggested missouriensis, but are probably closer to truncata.

2092--Rudbeckia tenax C.L. Boynt. & Beadle

Asteraceae <Heliantheae>: *Rudbeckia tenax* {suggested: *fulgida** var. t.} This was recognized as a species by Sm and F but has been largely overlooked for 50 years. Its stoloniferous habit, small basal leaves, and pubescence patterns are generally distinctive (J. Campbell, in prep.). *R. tenax* is distributed across southeastern states, typically in dry rocky glades and open woodlands on base-rich soils. Some colls. come from roadsides on sandy uplands of the Cumberland Plateau, where there appears to be hybridization with typical *fulgida*, but these populations are probably somewhat adventive and promoted by imported limestone gravel. There may be also some intergradation with *speciosa* and *truncata*; see notes under those species.

HAB 12,10 + D? 4. **ABU** g8 s8 -3.

2093--Rudbeckia aff. tenax {"tenax-speciosa intermediates"}

Asteraceae <Heliantheae>: *Rudbeckia* aff. *tenax* {"tenax-speciosa intermediates"}

The plants mapped here are similar to scattered colls. from Tenn., Mo., Ind., Ohio, Pa., Conn., Mich. and probably elsewhere (GH, MO, NY). They appear close to *tenax*, but have relatively long, narrow, lanceolate cauline leaves, often with large irregular serrations or lacerations. They have been recorded from relatively damp lowland habitats, in contrast to the rocky glades of typical *tenax*. These differences suggest a transition to *speciosa* (as circumscribed here), and a closer analysis of these two species is needed throughout their ranges.

HAB 9? D? 5? **ABU** g6? s2? -5.

2094--Rudbeckia speciosa Wenderoth

Asteraceae <Heliantheae>: *Rudbeckia speciosa* (*fulgida** var. s.) This is a variable, widely reported species (or variety of *fulgida*), but it is generally uncommon (F, Cr, FNA 21). It has been much confused with *palustris* and *umbrosa* in some treatments; see also notes under "tenax-speciosa intermediates" and *sullivantii*. It may be reasonable to adopt a broader definition of *speciosa*, that would include most or all of these taxa as segregates, except *umbrosa*.

Typical *speciosa* (as outlined here) appears to occur in midwestern fens, and in calcareous seeps of east-central states from the Appalachian Ridge & Valley region to the Ozarks, but it is rare in Ky. and Tenn. (Ch). The only Ky. site currently known is the seep with *Parnassia grandiflora* in CLIN near "Falls-of-76"; see colls. of M. Medley (DHL and for WKY). There is also an 1835 coll. of C.W. Short (mounted with *hirta* at GH), without locality.

HAB 6,9 D? 5. **ABU** g7? s2 -4?

2095--Rudbeckia sullivantii C.L. Boynt. & Beadle

Asteraceae <Heliantheae>: *Rudbeckia sullivantii* (*fulgida** var. s.) This taxon occurs mostly in the Ozark region, midwestern Till Plains and the Alleghenies. It has been much confused with *speciosa* and with *fulgida* var. *palustris*, both of which may intergrade. *R. sullivantii* might be reasonably treated as a variety of *speciosa*, as might the closely related *R. deamii* Blake in central and southern Ind. The only wild record of *sullivantii* from Ky. is a coll. from BARR: H.A. Ahles #7559 (Mississippi State University); 22 Aug 1953; "woodland, Mammoth Cave Park National Forest." However, in recent decades, a cultivar of *sullivantii* known as "Goldsturm" has become widely grown in flower-beds and it may locally escape.

HAB 6,9 D? 5. **ABU** g7? s2 -4?

2096--Rudbeckia triloba L. var. triloba

Asteraceae <Heliantheae>: *Rudbeckia triloba* var. t. This is a biennial or short-lived perennial (with basal offsets) that is widespread in eastern states, except for parts of New England. Although the species is relatively uniform within Ky., there are several segregates across its whole range; $2n = 38$ and 57 . Var. *triloba* is largely absent from Appalachian regions within the state, except along low roads with calcareous gravel.

HAB f-10,7 D 4. **ABU** g9 s9 -3.

2097--Rudbeckia triloba L. var. rupestris (Chickering) Gray

Asteraceae <Heliantheae>: *Rudbeckia triloba* var. *rupestris* This distinct large-headed taxon is known from the southern Appalachians and perhaps further north. Further study of its status is needed, with attention to chromosome number; Cr noted that triploids ($2n = 57$) in *triloba* are "more northeastern." The only record of var. *rupestris* from Ky. is a coll. from "Pine Mt. State Park Nature Center" in BELL (KY), which was annotated "triploid" by K. McCrea.

HAB 7? C? 4. **ABU** g4? s2? -3?

2098--*Rudbeckia triloba* L. var. *beadlei* (Small) Fern. T

Asteraceae <Heliantheae>: *Rudbeckia triloba* var. *beadlei* ("pinnatiloba")
This taxon is known mostly from base-rich cliffs in southern Appalachian regions, but it may not be clearly distinct from typical *triloba* (Cr, M, W, FNA 21). In Ky. there are only a few tentative records, based on colls. from EDMO (E.L. Braun #3620 at US), MCRE (JC 14 May 1989 at KY) and MERC (M. Wharton #9255 at KY). The earlier name, var. *pinnatiloba* Torr. & Gray, refers to plants from Ala., Fla., La. and Tex. that are similar to *beadlei* but do deserve further distinction (W).

HAB 10,12? C? 4. **ABU** g5? s2? -3?

2099--*Rudbeckia subtomentosa* Pursh

Asteraceae <Heliantheae>: *Rudbeckia subtomentosa*
This tall rhizomatous plant occurs mostly in midwestern prairies, and it may be adventive further east (W). In Ky. it is a rare native remnant of the "barrens" that used to exist on the Mississippian Embayment and adjacent Karst Plain.

HAB 9,10 C 5. **ABU** g8 s2 -5.

2100--*Rudbeckia laciniata* L. var. *humilis* Gray

Asteraceae <Heliantheae>: *Rudbeckia laciniata* var. *humilis* (R. *digitata*)
This largely southern Appalachian taxon is generally less robust than typical *laciniata*, with less cleft leaves. It is reported to be usually sexual (versus usually apomictic), with a low chromosome number; $2n = 38$ (FNA 21). F, G and Cr reported it from Ky., apparently based on: T.H. Kearney #324 (GH), Aug 1893, "Poor Fork Post Office." Recently, MM also collected and determined a plant from Buffalo Cr. in OWSL (for WKY) as this taxon. These colls. appear to match published descriptions, but there has been some inconsistency among recent treatments (e.g. Cr and FNA 21). Further work is needed in field and herbarium.

HAB 1,4? C? 4? **ABU** g7? s3? -2?

2101--*Rudbeckia laciniata* L. var. *laciniata*

Asteraceae <Heliantheae>: *Rudbeckia laciniata* var. l.
This tall rhizomatous woodland plant of damp fertile soils is widespread in eastern and central North America, but it is generally restricted to larger river valleys with little access for livestock. It is rare to absent along streams in farmed regions of Ky. and Tenn., including the Bluegrass region, Mississippian Plateaus and Nashville Basin (Ch). R. *laciniata* is highly

variable across its range ($2n = 36$ to $102+$), but almost all plants in Ky. are referable to var. *laciniata*.

HAB 4,6,1 D 3. **ABU** g10 s10 -3.

2102--*Rudbeckia grandiflora* (D. Don) J.F. Gmel. ex DC. var. *alismifolia* (Torr. & Gray) Cronq. R

Asteraceae <Heliantheae>: *Rudbeckia grandiflora** var. *alismifolia*
This taxon occurs mostly on the Gulf Coastal Plain, west of the Mississippi Rv.

Var. *grandiflora* is largely Ozarkian (FNA 21), but may be native in some disjunct prairies and glades as far as nw. Ga. (W). Var. *alismifolia* is known from two old colls. in JEFF (DHL), which could have been native or adventive: P.A. Davies #743/748, 2/4 Aug 1943, uncultivated field/dry hillside, Illinois Avenue. There are no other records of this species from the state.

2103--*Rudbeckia hirta* L.

Asteraceae <Heliantheae>: *Rudbeckia hirta* (var. *hirta*)
These broad-leaved plants occur mostly from Appalachian regions to the Ohio Valley (F). They are generally distinct from *serotina* in appearance and habitat, but some colls. are hard to assign. Natural variation in the *hirta* group, broadly defined, deserves more attention. Human disturbances of the landscape has probably allowed expansion of more weedy races, and there has been much propagation of selected genotypes in "wildflower" plantings. Although plants of the *hirta* group are generally described as annual or biennial, some individuals (at least in cultivars) can persist for more than two years; see also D.

HAB 7,10 ::? C 4. **ABU** g9 s8 -3.

2104--*Rudbeckia serotina* Nutt.

Asteraceae <Heliantheae>: *Rudbeckia serotina* (*hirta* var. *pulcherrima**)
This weedy plant is considered to have a largely western origin in prairies of the Great Plains, but it spread to the east after forest clearance (F, Cr). There appears to have been some intergradation with typical *hirta*, and now there is frequent confusion by botanists.

HAB F-10 ::? D 5. **ABU** g10 s10 -1?

2105--*Ratibida pinnata* (Vent.) Barnh.

Asteraceae <Heliantheae>: *Ratibida pinnata*

This diploid ($2n = 28$) ranges widely over eastern states, mostly west of the Appalachians and concentrated in the midwest. It is generally restricted to remnants of native grassland on dry base-rich soils, but it is locally adventive. In Ky. it occurs mostly in three regions: (1) in or near the former Big Barrens on the western karst plains; (2) in rocky glades on the Knobs region; and (3), more locally, on rocky hillsides of the Bluegrass region.

HAB f-12,10,11,8 E 5. **ABU** g9 s8 -4.

2106--*Eclipta prostrata* (L.) L.

Asteraceae <Heliantheae>: *Eclipta* [*Verbesina*] *prostrata* (alba)

This diploid ($2n = 22$) is a weedy annual native to warmer American regions, but now pantropical. It is typical of shorelines and other open or disturbed habitats on damp fertile soils. The name *E. alba* (L.) Hassk. has been applied to plants in the Western Hemisphere, but these may not be clearly distinct (FNA 21, Y and citations).

HAB f-9,1 ::? D 6. **ABU** g10 s9 -2.

2107--*Verbesina occidentalis* (L.) Walt.

Asteraceae <Heliantheae>: *Verbesina* <*Phaetusa*> *occidentalis*

This southeastern species is most common in Va., N.C. and S.C., especially on soils which are relatively base-rich for that region (F, W). In Ky. *occidentalis* does not overlap much in range with the more southwestern species, *helianthoides* and *virginica*. This pattern appears partly related to substrate, with *occidentalis* concentrated on more acid soils, but historical factors may also be involved. *V. occidentalis* is often especially abundant in old rough pastures, where cattle avoid the plants.

Reported extensions or disjunctions of *occidentalis* to the west of Ky., Tenn. and Ala. are largely anomalous and deserve further verification (Cr, FNA 21, K, PL). The species is not verified in Ark. or Mo. (Y). It has apparently been confused with *alternifolia* or *helianthoides*, leading to erroneous reporting of ranges. Identifications have often relied too much on the tendency of *occidentalis* to have largely opposite leaves, and the other species to have largely alternate leaves. A better key is needed, emphasizing differences in head dimensions, components and numbers. *V. occidentalis* has the smallest heads of yellow-flowered species in North America, with involucre only 3-5 mm wide, and rays numbering only (0) 1-3 (5). *Verbesina* is a large diverse genus of warmer American regions. Several sections have been established (W), in some cases recognized as separate genera (Sm, Gl).

HAB g-10,7 C 4. **ABU** g9 s9 -1?

2108--*Verbesina helianthoides* Michx.

Asteraceae <Heliantheae>: *Verbesina* <*Pterophyton*> *helianthoides*

This occurs in east-central states, especially Ozarkian regions. It usually grows in thin woods or transitions to grassland on dry base-rich soils. In Ky. *helianthoides* appears restricted to western regions, but it does occur in se. Ohio (Adams Co.), and it might be expected in adjacent LEWI. B's sight record from PULA is mapped here but may be questioned.

HAB f-12,10,7 D 4. **ABU** g8 s8 -4.

2109--*Verbesina alternifolia* (L.) Britt. ex Kearney

Asteraceae <Heliantheae>: *Verbesina* <*Actinomeris*> *alternifolia*

This is widespread across east-central states, usually in thin woods and brushy old fields on low sites with moist to damp fertile soils. *V. alternifolia* is among the most distinctive species of the genus in eastern states; $2n = 68$ (versus 34 in most other species). But plants of *alternifolia* sometimes have largely opposite or subopposite leaves, even at upper nodes, and can then be misidentified as *occidentalis* (see also Y).

HAB f-10,7,6,4 D 4. **ABU** g10 s10 -2?

2110--*Verbesina virginica* L.

Asteraceae <Heliantheae>: *Verbesina* <*Ochraetia*> *virginica*

This is broadly distributed in base-rich regions across southeastern states, but extends north only as far as a line from e. Va. through Ky. to e. Kans. (FNA 21, PL). The rather abrupt northern edge of this species range in Ky. is curious, given no clear relationship to topography or soils. Could its tenderness be related to the peculiar watery extrusion from frosted stem remnants in winter?

HAB f-10,7 D 4. **ABU** g9 s9 -1?

2111--*Helianthus annuus* L.

Asteraceae <Heliantheae>: *Helianthus* <*Annui*> *annuus*

This common annual is widely cultivated (as the "sunflower"), but it also escapes and appears naturalized along disturbed rights-of-way and similar sites. Though probably originating in the southern Great Plains, *annuus* became domesticated for oil and other uses by native people in eastern states (C.B. Heiser in Ford 1985; Smith 2006). Selection has increased seed size and head size, especially during the past century or so, but within a few generations of naturalization cultivars revert to wilder types. Varieties have

not been recognized in recent treatments; but see notes on hybrids under *petiolaris* ($2n = 34$ in both) and with *tuberosus*.

ALI W. **HAB** 10 ::: D 6. **ABU** +5.

2112--*Helianthus petiolaris* Nutt. T

Asteraceae <Heliantheae>: *Helianthus* <Annui> *petiolaris*

This annual occurs mostly in the Great Plains, and reports from Ky. have probably been erroneous (M). Colls. of R. Athey (EKY, MEM) under this name appear somewhat distinct in their finely serrated leaf margins, but are closer to *annuus*. However, *petiolaris* is known from se. Mo., where hybrids with *annuus*, or perhaps introgressants, can be difficult to distinguish from the parents (Y).

ALI W.

2113--*Helianthus angustifolius* L.

Asteraceae <Heliantheae>: *Helianthus* <Angustifolii> *angustifolius*

This relatively uniform diploid ($2n = 34$) is widespread across southeastern states in open habitats. In Ky. it may be loosely associated with diverse remnants of thin woodland or grassland in southeastern regions, but it also seems to be spreading along rights-of-way. It was not recorded in the state before the 1930s (B), and it may be increasing.

HAB f9,10 :: C 5. **ABU** g10 s7 -1?

2114--*Helianthus silphioides* Nutt.

Asteraceae <Heliantheae>: *Helianthus* <Atrorubentes> *silphioides* (*atrorubens* var. *pubescens*)

This is centered in and near the Ozark Region. Both *silphioides* and *atrorubens* are diploids ($2n = 34$), typical of woodland trails, thickets and unkempt rights-of-way in regions with a significant history of burning before settlement. They overlap mostly in Tenn., where there appears to be some intergradation. In Ky. there has been confusion between these two taxa, and some colls. need to be rechecked. Some colls. from CALL (WKY) may be hybrids with *occidentalis*.

HAB f-10,7 C? 4. **ABU** g7 s3? -5.

2115--*Helianthus atrorubens* L.

Asteraceae <Heliantheae>: *Helianthus* <Atrorubentes> *atrorubens* (var. a.)

This southeastern species occurs mostly east of the Mississippi Rv., and it is most common on or near the Atlantic Coastal Plain, Piedmont and southern Appalachian regions (K). In Ky. it is known only from southeastern counties

on the Appalachian Plateaus, but it does occur close to the Ky. line in w. Tenn. (Ch).

See notes under *silphioides*, which has been confused.

HAB 10,7 B 4. **ABU** g8 s7 -3.

2116--*Helianthus giganteus* L.

Asteraceae <Heliantheae>: *Helianthus* <Gigantei> *giganteus*

This is a relatively uniform diploid ($2n = 34$) typical of damp thickets and edges in northeastern and midwestern states and adjacent Canada. In Ky. there may be rare hybrids with *decapetalus* (?) and *mollis* (= *X doronicoides* Lam.); others may be expected (FNA 21). See notes under *grosseserratus*.

HAB f-9,1 C 5. **ABU** g10 s7 -4.

2117--*Helianthus grosseserratus* Martens

Asteraceae <Heliantheae>: *Helianthus* <Gigantei> *grosseserratus* (*instabilis*)

This largely midwestern diploid ($2n = 34$) is generally assigned adventive or uncertain status in most southeastern states (F, Cr, FNA 21, W). It is probably native to Ky. in some remnants of grassland on deeper calcareous soils, but it also appears to have spread along roadsides. There has been some confusion with *giganteus* and *maximiliani*, and hybridization is known. *H. giganteus* (on medium acid soils) and the closely related *grosseserratus* (on more base-rich soils) are among the tallest perennial herbs in Ky., reaching 4-5 m under optimal conditions; see also *Sida hermaphrodita*.

Compared to *giganteus* and *maximiliani*, *grosseserratus* has leaves with longer petioles (ca. 1-5 cm versus 0-1.5 cm); also, the blades are larger (mostly 10-30 x 3-5 cm versus 8-20 x 1-3.5 cm), usually deep-serrate (versus shallow- to subentire), paler and densely puberulent below (versus green and scabrid-hirsute). Its rhizomes tend to be more elongated, sending up colonial stems that tend to be less hairy in the inflorescence and more glaucous, but these are not diagnostic differences. Heads of *grosseserratus* tend to be larger, with rays 2-4.5 cm (versus 1.5-3 cm), and with less marginal pubescence on phyllaries and disc florets.

HAB f-10 D 5. **ABU** g9 s7 -3?

2118--*Helianthus maximiliani* Schrad.

Asteraceae <Heliantheae>: *Helianthus* <Gigantei> *maximiliani*

This diploid ($2n = 34$) species of the Great Plains does not appear to be native in eastern states, except for a few possibly adventive records in northern regions (Cr, Y, W). In Ky. there were no records before Beckett (1956), but

one or more cultivars have been widely promoted in recent decades for supposed wildflower meadows and wildlife benefits. Persistent plantings and escapes are widely scattered and sometimes misinterpreted as native.

ALI W. **HAB** F-10 D 5. **ABU** +5*.

2119--*Helianthus microcephalus* Torr. & Gray

Asteraceae <Heliantheae>: *Helianthus* <Microcephali> *microcephalus*

This is a relatively uniform diploid ($2n = 34$), widespread in thin woods and edges across eastern and southeastern states. There may be occasional hybrids with *divaricatus* and other species.

HAB 7,8,11 C 3. **ABU** g10 s10 -2.

2120--*Helianthus decapetalus* L.

Asteraceae <Heliantheae>: *Helianthus* <Divaricati> *decapetalus*

This largely Appalachian and northeastern species has often been confused with *trachelifolius*, *tuberosus* and other species, and there may be some hybridization (J. Campbell, in prep.). *H. decapetalus* is largely unknown in midwestern regions (in and around Mo.), where *trachelifolius* can occupy similar habitats, and in Ky. there seems to be little overlap of ranges.

Diploids ($2n = 34$) are reportedly restricted to Appalachian and Atlantic regions. Those generally less robust plants tend to have smaller, more closely serrated leaves, with shorter guard-cells, but they may not be reliably distinguished (Heiser et al. 1969). Most plants in Ky. are probably tetraploids, but D.M. Smith tentatively identified some colls. as diploids, including those mapped in BELL, MART and MCRE by Smith (1960) and Heiser et al. (1969).

HAB 4,8,7 D 3. **ABU** g9 s9 -3.

2121--*Helianthus tuberosus* L.

Asteraceae <Heliantheae>: *Helianthus* <Divaricati> *tuberosus*

This variable hexaploid ($2n = 102$) is widespread in east-central states, and sometimes confused with *decepetalus*, *trachelifolius*, *hirsutus* or other species; occasional hybrids are suspected (FNA 21). In some eastern states, *tuberosus* is considered introduced from further west, but in Ky. it appears native on fertile floodplains in general, and even on some calcareous uplands. In the Bluegrass region it is especially frequent, sometimes growing in woodland edges and old fields on seasonally dry sites.

H. tuberosus was cultivated by some native people in northeastern states, selecting for larger tubers. Upper midwestern plants with large tubers are often densely pubescent, and may be named var. *subcanescens* Gray (F). But wild plants in Ky. do not generally have much enlarged tubers, and neither do plants in Ind. (D). More tuberous plants were selected further in Europe to become widely grown for food as the "Jerusalem artichoke" then returned to North America (C.B. Heiser in Ford 1985; Heiser et al. 1969); the "sunchoke" is an artificial hybrid with *annuus*.

Pubescence in Ky. varies greatly; stems are virtually glabrous in some cases. Plants in the Mississippian Embayment with more strongly reflexed phyllaries, densely velutinous lower leaf surfaces and shorter petioles may reflect hybridization with *H. resinosus* Small. That is a closely related hexaploid of similar habitats, locally abundant from N.Car. to Miss. and expected in w. Tenn. and w. Ky.

HAB f-8,4,10 E 4. **ABU** g9 s9 -3.

2122--*Helianthus trachelifolius* P. Mill.

Asteraceae <Heliantheae>: *Helianthus* <Divaricati> *trachelifolius* {or suggested: *strumosus* var. *t.*}

This was recognized as a species by F and others, but has been largely ignored for 50 years. Heiser et al. (1969) indicated that it is probably the tetraploid form of *strumosus* (with $2n = 68$), and suggested treatment as a variety or subspecies. *H. trachelifolius* is generally distinct from typical *strumosus* within the core of its midwestern to southeastern range, but there appears to be some intergradation in regions of overlap. There has also been much confusion--and probably some introgression--with *decapetalus* and other tetraploids, especially with *hirsutus* in w. Ky. and w. Tenn.

H. trachelifolius differs from typical *strumosus* in its leaves, which are usually subtruncate (versus more gradually tapering), with the non-winged portion of petiole ca. (0.5) 1-2 (3) cm long (versus (0.3) 0.5-1 (1.5) cm); lower surfaces are deep or pale green (versus grayish, whitish or glaucous), pubescent on veins and often throughout (versus often glabrous except on main veins); margins are serrated with teeth ca. 1 mm high (versus weakly serrated to subentire). It flowers mostly in mid-July to late Aug, about a month earlier than typical *strumosus*.

HAB f-8,10 C? 4. **ABU** g9? s7? -4.

2123--*Helianthus strumosus* L.

Asteraceae <Heliantheae>: *Helianthus* <Divaricati> *strumosus* (var. s.)

This taxon is widespread in eastern states, except towards the southwest. In this strict sense (without *trachelifolius*), *strumosus* includes hexaploids ($2n = 102$), but perhaps no tetraploids. It has often been confused with other taxa (F; Heiser et al. 1969). Further analysis is needed, including more thorough collections from regions of overlap with *eggertii* and *trachelifolius*, which both could be treated as subspecies or varieties of *strumosus*. Like those other taxa, *strumosus* is typical of thin woods and edges on medium acid soils, and it can proliferate after forest fires. In Ky. it is largely restricted to Appalachian regions and lowlands in the Knobs, where it tends to be most common in submesic swales with more seasonal dampness than adjacent subxeric uplands.

HAB f-8,10 C 4. **ABU** g9? s8 -4.

2124--*Helianthus eggertii* Small

Asteraceae <Heliantheae>: *Helianthus* <Divaricati> *eggertii* {or suggested: *strumosus* var. e.}

This hexaploid ($2n = 102$) is close to *strumosus* (see above). It occurs mostly in remnants of thin grassy woodland and transitions to associated "barrens" on the Interior Low Plateaus in Ala., Tenn. and Ky. (FNA 21). A few colls. from the Cumberland Plateau in Ky. and Tenn. (EKY, MO, TENN) and elsewhere could be tentatively assigned to *eggertii*, extending its previously known range, but distinction from narrow-leaved forms of *strumosus* is often difficult and maybe impossible in some cases. *H. eggertii* is a variable taxon that still deserves more precise circumscription and a thorough search for herbarium material. There are also *eggertii*-like plants, or putative *strumosus*-*eggertii* transitions, collected from Ark., Ill., Miss., Ga. and S.C. (e.g. at GH, MO, NCU and Univ. of South Carolina).

HAB f-8,10 C 4. **ABU** g5? s5 -5.

2125--*Helianthus divaricatus* L.

Asteraceae <Heliantheae>: *Helianthus* <Divaricati> *divaricatus*

This is a relatively uniform, mostly diploid ($2n = 34$) species that is widespread in thin dry woods and edges across eastern North America, except on much of the southeastern Coastal Plain. In Ky. there appear to be occasional hybrids with *hirsutus* and, especially in Appalachian regions, with *microcephalus* (X *glaucus* Small). Unusually robust plants (perhaps tetraploid) occur to the west of Ky. (Y, FNA 21).

HAB 11,8,10 C 3. **ABU** g10 s9 -3.

2126--*Helianthus hirsutus* Raf.

Asteraceae <Heliantheae>: *Helianthus* <Divaricati> *hirsutus* (?*divaricatus* var. *scaberrimus*)

This tetraploid ($2n = 68$) is widespread in open habitats of eastern and southeastern states. It varies much in pubescence, leaf blade dimensions and petiole length. Some robust plants with longer petioles resemble *tuberosus*, and may result from hybridization (Heiser et al. 1969; FNA 21). Plants with subsessile leaves can resemble *divaricatus*, especially if pubescence is also reduced, and hybridization is often suspected despite the reported difference in chromosome number. Several colls. with less hairy stems are referable to var. *trachyphyllus* Torr. & Gray, a largely western form that suggests a transition to *decapetalus* (F).

HAB f-10,12,8 D? 4. **ABU** g10 s10 -4.

2127--*Helianthus mollis* Lam.

Asteraceae <Heliantheae>: *Helianthus* <Divaricati> *mollis*

This is a relatively uniform diploid ($2n = 34$) typical of native grasslands, especially in midwestern regions, and occasionally adventive to the east. There may be rare hybrids with *occidentalis* (= X *cinereus* Torr. & Gray), *giganteus* (?= X *doronicoides* Lam.) and perhaps *hirsutus* (Cranfill 1992); see M for records of these hybrids from Ky.

HAB f-10,12 C 5. **ABU** g9 s7 -4.

2128--*Helianthus occidentalis* Riddell

Asteraceae <Heliantheae>: *Helianthus* <Divaricati> *occidentalis* (var. o.)

Typical *occidentalis* is a relatively uniform diploid ($2n = 34$) taxon of east-central and midwestern states, but variation needs further study. A few colls. from Ky. appear to be hybridized with *hirsutus* (MEAD at KY), *mollis* (HARD at KY) or perhaps *silphioides* (R. Athey #1956 from CALL at WK and MEM, initially named "*dowellianus*"). See also notes on the colls. from PULA under *dowellianus*.

HAB 12,10 D 4. **ABU** g9 s7 -4.

2129--*Helianthus occidentalis* Riddell var. *dowellianus* (M.A. Curtis) Torr. & Gray T

Asteraceae <Heliantheae>: *Helianthus* <Divaricati> *occidentalis* var. *dowellianus*

This largely Appalachian taxon differs from typical *occidentalis* in its more branched and leafy stems; leaves are broader, sometimes more serrated, usually withering soon at the base, less reduced up the stems, and less

pubescent (scabrous/strigose versus hirsute on upper leaf surfaces). Var. *dowellianus* is somewhat similar to *atorubens*, and hybrid origin has been suggested (Heiser et al. 1969), but F suggested a broader concept, with similarity also to *H. laetiflorus* Pers. (sensu lato).

In Ky. three colls. from PULA were initially referred to this taxon in 1940-1960. Their identification remains uncertain, along with the status of var. *dowellianus* in general: (1) E.L. Braun (see B but not located at US), "very distinct in appearance and habit of growth, and in habitat; dry soil, open grassy slopes"; (2) F.T. McFarland (F, MO, etc.), probably in the same general locality as B, a roadside near Somerset; and (3) D.M. Smith-K-121 (KY), 11 Sep 1958, roadside 2.5 miles southeast of Science Hill.
HAB 10,8? C? 4. **ABU** g8? s2? -5.

2130--*Helianthus laetiflorus* Pers. (sensu lato)

Asteraceae <Heliantheae>: *Helianthus* <Divaricati> *laetiflorus* (+ *pauciflorus*, *rigidus*)

This hexaploid ($2n = 102$) species, in a broad sense, is a variable complex that mostly occurs from northeastern states to the northern Great Plains. Plants in Ky. need further study; in most cases it is unclear if the records mapped here are from native plants, adventive waifs, or escaped cultivars.

Most Ky. colls. have been referred to typical *laetiflorus*, a largely northeastern taxon that is often cultivated and considered by some authors (Clevenger & Heiser 1963; Cr, FNA 21) to be derived from hybridization with *tuberosus* (another hexaploid). Some colls. mapped here may indeed be closer to *tuberosus*, especially the one from CALL (MUR). In contrast, colls. from EDMO (Harvill 1941), HARD (Okla. State Univ.) and JEFF (DHL) appear to represent native *H. laetiflorus* var. *pauciflorus* (Cass.) Fern. (= *H. rigidus* (Cass.) Desf.), which is centered in the upper midwest.

ALI w. **HAB** F-10? C? 5. **ABU** g10? s3? -5.

2131--*Heliopsis helianthoides* (L.) Sweet var. *helianthoides*

Asteraceae <Heliantheae>: *Heliopsis helianthoides* var. *h.*

This occurs mostly in east-central states. In its broader sense, *helianthoides* is a widespread eastern species ($2n = 28$), but with a relatively distinct segregate in southeastern regions (*gracilis*) and a less clear-cut segregate in midwestern regions (*scabra*). See notes under *scabra*.

HAB f-10,7,4 D 4. **ABU** g9 s9 -3.

2132--*Heliopsis helianthoides* (L.) Sweet var. *scabra* (Dunal) Fern.

Asteraceae <Heliantheae>: *Heliopsis helianthoides* var. *scabra*

This largely midwestern taxon intergrades with the more eastern var. *helianthoides* in Ky. and elsewhere (FNA 21). Colls. from CHRI (B, APSU), GRAY (R. Seymour), HART (P. Measle), LOGA (WKY) and perhaps elsewhere do appear relatively distinct in their narrow, scabrous leaves.

HAB f-10,12? D 4. **ABU** g9 s7? -4.

2133--*Melanthera nivea* (L.) Small

Asteraceae <Heliantheae>: *Melanthera nivea* (*hastata*)

This is widespread across the Gulf Coastal Plain, Caribbean regions and northern South America. It occurs in various types of woodland on seasonally damp fertile soils, often along trails and edges.

HAB 7,4,6? D? 3. **ABU** g10 s4 -5.

2134--*Bidens laevis* (L.) B.S.P. R

Asteraceae <Heliantheae>: *Bidens laevis*

This is widespread in warmer American regions. There have been several reports from Ky., but no verified colls. have been seen (M). Cr (1980, 1991) noted a record from POWE, but also stated that *laevis* ($2n = 22, 24$) is "chiefly but not wholly coastal" and "passes into" *cernua*. Similar confusion has occurred in Mo. (St, Y) and elsewhere, so that distinction of the two taxa has been questioned (FNA 21). In addition to its distinctively larger rays and reddish receptacular bracts, *laevis* is reportedly sometimes perennial (F, Cr); all other *Bidens* in eastern states are annual (or some occasionally biennial).

2135--*Bidens cernua* L.

Asteraceae <Heliantheae>: *Bidens cernua*

This variable annual ($2n = 24, 48$) is widespread in temperate regions of North America and Eurasia, but described segregates (e.g. F) have not been recognized in recent treatments (e.g. FNA 21). Var. *elliptica* Wieg. was described from BELL (M), and F treated it as a relatively northern segregate that hybridizes with *connata*. In some early literature (e.g. Gm), *cernua* has been misidentified as *laevis*, which may also intergrade; see notes under *laevis*.

HAB 9,2,1 :: D 6? **ABU** g10 s8 -2?

2136--*Bidens comosa* (Gray) Wieg.

Asteraceae <Heliantheae>: *Bidens comosa* {suggested: *tripartita* var. *c.*}

This is widespread in cool temperate regions of North America. It has often been confused with *connata* or *tripartita*, and all three taxa have been combined to various extents by some authors (e.g. FNA 21, Y). Cr indicated that *comosa* is at least partly diploid ($2n = 24$), but FNA 21 stated that North American plants within the *tripartita* complex are all tetraploids ($2n = 48$); in its broad circumboreal sense *tripartita* includes a wider range of chromosome numbers ($2n = 24, 48, 60$; Y). *B. comosa* appears to be much more common in Ky. than the other two taxa, but further revision is desirable.

HAB f-9,10? :: C 6? **ABU** g10 s9 -2?

2137--*Bidens connata* Muhl. ex Willd. T

Asteraceae <Heliantheae>: *Bidens connata* {suggested: *tripartita* var. c.} This is close to *comosa*, with similar range, and may have originated from hybridization with *frondosa* (Crowe & Parker 1981). It may be typical of damper sites (F, Cr). In Ky. *connata* has been reported from CALL (MUR), HICK (Grubbs 1989) and KENT (B), but further verification is needed. These colls. may be referable to the relatively southern var. *petiolata* (Nutt.) Farw., but that taxon has not generally been recognized in recent treatments.

HAB 9,1? :: C? 6? **ABU** g9 s2? -4?

2138--*Bidens tripartita* L. T

Asteraceae <Heliantheae>: *Bidens tripartita* (var. t.)

This alien is close to *connata* and *comosa*, which are combined by some authors. A coll. from the banks of the Rockcastle Rv. in PULA (KY) does appear to be typical *tripartita*, but further revision is advisable.

ALI EU. **HAB** 1? :: C? 6? **ABU** +4.

2139--*Bidens discoidea* (Torr. & Gray) Britt.

Asteraceae <Heliantheae>: *Bidens discoidea* This is a relatively uniform diploid species ($2n = 24$) that is widely scattered in eastern North America, usually in thin swampy forests and marshy transitions to open water. It can also disperse into small pond margins. Although largely western within Ky., *discoidea* may be expected in suitable habitat anywhere in the state.

HAB 3,2,6 :: C 4? **ABU** g9 s8 -2.

2140--*Bidens frondosa* L.

Asteraceae <Heliantheae>: *Bidens frondosa* This variable weedy species ($2n = 24, 36, 48, 72$) is widespread on damp fertile soils across temperate regions of North America. In Ky. there has been

some confusion with *vulgata* ($2n = 24, 48$), but no hybrids are documented. *B. frondosa* is reported to hybridize with the *comosa*-*connata* complex (F).

HAB f-10,7,4,1 :: D 4? **ABU** g10 s10 +1?

2141--*Bidens vulgata* Greene

Asteraceae <Heliantheae>: *Bidens vulgata*

This is widespread in temperate regions of North American, except in some southeastern states. It is sometimes confused with *frondosa*, but these taxa are consistently distinct. *B. vulgata* is a generally more robust plant that tends to be more restricted to deeper wetlands, and in Ky. at least it is generally absent from more calcareous regions.

HAB f-9,2? :: C? 6? **ABU** g10 s8 -2?

2142--*Bidens bipinnata* L.

Asteraceae <Heliantheae>: *Bidens bipinnata*

This cosmopolitan weed may have been native to both eastern North America and eastern Asia (FNA 21). It is somewhat varied in morphology and chromosome number (with $2n = 24$ and 72); segregates have not been recognized in recent literature but deserve investigation. Although mapped as an "invasive species" by SE, this may be misguided; *B. bipinnata* has already saturated its niche in southeastern states, from whatever source.

HAB f-10,12 ::+ D 6. **ABU** g10 s9 +1?

2143--*Bidens pilosa* L. W

Asteraceae <Heliantheae>: *Bidens pilosa* {sensu lato}

This has been treated as a widespread variable species of warmer American regions, but a narrower concept may be warranted (FNA 21, W, Y). The only known coll. from Ky. appears to be a rare waif: J.W. Thieret, 3 Oct 1977, weed among low planted junipers, rest area of Interstate 75 between Berea & Richmond (KNK). This coll. is probably referable to var. *radiata* Schultz (= *B. alba* (L.) DC. var. *radiata* (Schultz-Bip.) Ballard ex T.E. Melchert), which has more rays and phyllaries ($2n = 48$) and extends north more frequently than typical *pilosa*, which lacks rays ($2n = 72$).

ALI SA.

2144--*Bidens trichosperma* (Michx.) Britt.

Asteraceae <Heliantheae>: *Bidens trichosperma* ("coronata"*)

Until recently (FNA 21), this widespread eastern diploid ($2n = 24$) has been known incorrectly as *B. coronata* (L.) Britt. A few colls. from Ky. (B) have been referred to the northern var. *tenuiloba* (Gray) Sherff, but segregates have

not been recognized in recent treatments. There has been occasional confusion with depauperate plants of *aristosa*, and some colls. should be rechecked.

HAB f-9,6 :: C 6? **ABU** g9 s8 -2?

2145--*Bidens aristosa* (Michx.) Britt.

Asteraceae <Heliantheae>: *Bidens aristosa* (var. a.)

This is considered to have a largely midwestern native range that has expanded to the east after clearance (F, Cr). It may intergrade with *polylepis*; both are diploids ($2n = 24$). In 1914, Gm considered it native to Ky., but reported it only from CRIT "and other points along the Illinois Central Railroad." Some colls. mapped here are referable to var. *fritcheyi* Fern. (with awns retrorsely barbed) or var. *mutica* Gray (with awns rudimentary), but these taxa have not been recognized in recent treatments.

ALI w. **HAB** f-9,6,1 :: C 6. **ABU** g10 s9 +2?

2146--*Bidens polylepis* Blake

Asteraceae <Heliantheae>: *Bidens polylepis* {suggested: *aristosa* var. *involuta*/retrorsa}

The central native range of *polylepis* is considered to be somewhat more southern and western than *aristosa* (FNA 21). The two taxa appear to intergrade, and some authors have suggested varietal status (St, Cr) or combined them completely, as in Ark. and Mo. (Y), but a range-wide analysis is still needed. *B. polylepis* may be less shade tolerant (Cr) and more concentrated on wet ground (FNA 21).

B. polylepis differs from *aristosa* in its "calyculi" (bracts or bractlets around phyllaries), which are usually more numerous (ca. 12-21 versus 8-12) and broader (ca. 8-12 mm versus 5-7 mm); also, its disc florets are usually more numerous (ca. 60-100 versus 20-40); and its inner seeds (cypselae) are usually longer (7-8 mm versus 5-7 mm), with appended pappi (if developed) retrorsely barbed (versus antrorsely or retrorsely). Some plants with awns retrorsely barbed were transferred to *aristosa* as var. *retrorsa* (Sherff) Wunderlin (1972), but the nomenclature remains uncertain. *Coreopsis involucreta* Nutt. may be the earliest basionym within the whole complex.

ALI w. **HAB** f-9,6,1 :: D? 6. **ABU** g10 s10 +2?

2147--*Cosmos bipinnatus* Cav. C

Asteraceae <Coreopsideae>: *Cosmos bipinnatus*

This popular Mexican annual has had widespread ornamental use in Ky., including frequent plantings along roads, but it does not seem to persist or

spread into the wild. Other *Cosmos* species may be expected in cultivation; this is a diverse genus close to *Bidens*, but native to warmer regions ($2n = 24$ in general).

ALI S.

2148--*Coreopsis pubescens* Ell.

Asteraceae <Coreopsideae>: *Coreopsis pubescens*

This caespitose perennial has a somewhat bimodal range, concentrated in the Ozark region and around the southern Appalachians (Smith 1976). Within Ky. there are disjunct western and eastern records, but in Tenn. the range is more continuous (Ch). Variation within the species ($2n = 26, 28$) has been misinterpreted in Ky. (M, W). Some glabrate plants from WHIT (GH, MO) have been referred to var. *robusta* Gray ex Eames, but that southern Appalachian segregate (from Va. to Ala.) is completely glabrous and has relatively narrow leaves (ca. 0.6-2 cm wide versus 1.5-2 cm). See also notes under *lanceolata*.

HAB 1,4 C 4. **ABU** g8 s4 =.

2149--*Coreopsis grandiflora* Hogg ex Sweet

Asteraceae <Coreopsideae>: *Coreopsis grandiflora*

Treatments of this variable perennial or annual ($2n = 26+$) have been inconsistent in recent decades, and further study is needed (Smith 1976; Cr, FNA 21, Y, W). It is probably just planted or adventive in Ky. and Tenn., where most or all plants may be referable to var. *harveyana* (Gray) Sherff. That segregate was originally centered on the Ozark-Ouachita region, but has spread into eastern states. Var. *grandiflora* is more restricted to outcrops, and probably absent in northeastern states, including Tenn. and Ky. Other segregates occur in southern states. There has also been occasional confusion with *lanceolata*.

ALI W. **HAB** f-10,12? C? 4? **ABU** +4.

2150--*Coreopsis lanceolata* L.

Asteraceae <Coreopsideae>: *Coreopsis lanceolata*

This caespitose perennial is centered in the Ozark-Ouachita region. In southeastern states and perhaps even Mo. (St), *lanceolata* has been "often spread by cultivation, its original range obscure" (W). In Ky. native status is sometimes suggested, but the first record was by Harvill (1941); see also 1942 colls. of R.M. Kriebel at Purdue. It has often been misleadingly promoted as a wildflower along roadsides or in gardens, then perhaps persisting or spreading.

C. lanceolata is variable ($2n = 24, 26, 48$) and can hybridize with other species, including *auriculata*, *grandiflora* and *pubescens* (Smith 1976). A few colls. from GRAV (MUR), WARR (KY, WKY) and elsewhere appear referable to var. *villosa* Michx (which is perhaps hybridized with *pubescens*) but this and other variants have generally not been recognized in recent treatments (FNA 21, Y, W). Some colls. may need checking for possible confusion with *grandiflora*.

ALI w. **HAB** f-12,10 D? 4. **ABU** +4.

2151--*Coreopsis auriculata* L.

Asteraceae <Coreopsidae>: *Coreopsis auriculata*

This stoloniferous diploid ($2n = 24$) occurs only in southeastern states east of the Mississippi Rv. In Ky. it is largely restricted to thin woods and edges on moist acid soils, usually with some sand.

HAB 7,4,5 B 3. **ABU** g8 s8 -2.

2152--*Coreopsis tripteris* L.

Asteraceae <Coreopsidae>: *Coreopsis tripteris*

This short-rhizomatous diploid ($2n = 26$) is a widespread tall herb of eastern woodlands and grasslands on various types of soil (F, W). *C. tripteris* is locally abundant in Ky., but largely restricted to localities with a history of grassy openings on seasonally damp acid soils. In contrast, W reported that it is typical of base-rich soils within more southeastern states. There is significant variation across its range, but segregates have not been recognized in recent treatments.

Some plants sold in Ky. as "native" have more dissected, bluish (versus yellowish) leaves with unusually narrow segments (ca. 0.5-1 cm versus 1-2 cm), and they flower earlier than wild plants (Jul-Aug versus Aug-Sep). These may be derived from a more western or southern provenance.

HAB f-10,9,8 B 4. **ABU** g9 s8 -4.

2153--*Coreopsis major* Walt.

Asteraceae <Coreopsidae>: *Coreopsis major*

This variable rhizomatous species ($2n = 26, 78, 104$) is widespread in southeastern states in thin woods on dry acid soils. Plants from Ky. appear generally uniform, but several colls. are referable (following F) to the relatively robust plants, with more glabrous or lobed leaves, that have been

named var. *stellata* (Nutt.) B.L. Robins. That taxon has not been recognized in recent treatments.

HAB 11,7,12 B 3. **ABU** g9 s9 -2.

2154--*Coreopsis verticillata* L. C

Asteraceae <Coreopsidae>: *Coreopsis verticillata*

This variable rhizomatous species ($2n = 26, 52, 78$) is considered native only in east-coastal states from S.C. to Md. However, it has been widely grown for ornamental use and has locally escaped (Smith 1976; Cr, W). In Ky. it has been reported several times (M), but the only known coll. is from JEFF (KY-Agr., EKY): P.E. Allison, 22 Jun 1928, Louisville.

ALI E.

2155--*Coreopsis tinctoria* Nutt.

Asteraceae <Coreopsidae>: *Coreopsis tinctoria*

This annual diploid ($2n = 24$) of the central and southern Great Plains appears to be only planted and adventive in Ky. The coll. from LARU (KY) has unusually large leaves with broader segments, suggesting hybridization with another species. A somewhat similar southeastern species, *C. linifolia* Nutt., has also been suggested in Ky., from reports under various synonyms, but its presence is dubious (M).

ALI W. **HAB** R-10 :: C 6? **ABU** +4.

2156--*Marshallia grandiflora* Beadle & F.E. Boynt.

Asteraceae <Coreopsidae>: *Marshallia grandiflora*

This diploid ($2n = 18$) is restricted to somewhat disjunct open habitats in Appalachian regions, on damp or dry acid soils. In Ky. it is known only from boulder-cobble bars of the Big South Fork of Cumberland Rv., often close to populations of *Conradina verticillata*.

HAB 1 + B 5. **ABU** g4 s2 =.

2157--*Galinsoga quadriradiata* Cav.

Asteraceae <Coreopsidae>: *Galinsoga quadriradiata* (ciliata)

This cosmopolitan weed originates from Central and South America. See notes under *parviflora*.

ALI SA. **HAB** H-10,7 ::: E 6. **ABU** +5.

2158--*Galinsoga parviflora* Cav. R

Asteraceae <Coreopsidae>: *Galinsoga parviflora*

This cosmopolitan weed originates from southwestern U.S.A. to South America (Cr; FNA 21). It has been reported from MCRA (R. Athey catalog) and NELS (Greenwell 1935), but no confirmed colls. have been seen (M). *G. parviflora* (2n = 16) has often been confused with *quadriradiata* (2n = 32, 48, 64).

ALI S.

2159--*Madia glomerata* Hook. C

Asteraceae <Madieae>: *Madia glomerata*

This aromatic annual ("tarweed") is centered in or near the Rocky Mts. but now also adventive from the northern plains to New England (Cr). In Ky. it has been recorded only from archaeological sites of the Fort Ancient era (1000-1500 A.D.), when it may have been used by native people (Henderson 1998). *M. sativa* Molina is a distinct species (2n = 32 versus 28) that should also be expected; it is widespread in North and South America, and "becoming widespread as a roadside weed" in eastern states (Cr).

ALI W.

2160--*Helenium autumnale* L. var. *autumnale*

Asteraceae <Helenieae>: *Helenium autumnale* var. a.

This variable species is widespread in North America (2n = 32, 34, 36); var. *autumnale* occurs in eastern states. Sterile hybrids with *flexuosum* (2n = 28) have been reported (Y), and may be confused with the closely related *H. virginicum* S.F. Blake (also 2n = 28).

H. virginicum is known only from Va. and Mo. but should be searched for elsewhere (FNA 20, Y, W). It differs from *autumnale* in its oblanceolate basal blades, usually persistent to flowering (versus oblanceolate, obovate or spatulate, withering by flowering); its mid-stem leaves usually entire (versus usually dentate) and its upper leaves entire (versus entire or dentate); the pappus of disc flowers at least half as long as the tube, keel-less and abruptly long-awned (versus less than half, keeled and attenuate).

HAB gf-9,6,1 D 5. ABU g9 s9 -2?

2161--*Helenium autumnale* L. var. *parviflorum* (Nutt.) Fern.

Asteraceae <Helenieae>: *Helenium autumnale* var. *parviflorum*

This relatively narrow-leaved, small-headed variety is often indistinct from var. *autumnale*, and recent treatments have not generally recognized it (e.g. FNA 20). F indicated that it occurs in wetter habitats. In Ky. it may be more closely associated with major river valleys, especially to the west.

HAB gf-9,6,1 D 5. ABU g9 s8 -2?

2162--*Helenium flexuosum* Raf.

Asteraceae <Helenieae>: *Helenium flexuosum* (*nudiflorum*)

This is widespread in eastern states, but tends to be less common to the north, where perhaps partly adventive (Cr). See notes under *autumnale*. In Ky. it is typical of varied open habitats on damp, medium acid soils.

HAB gf-9,6,1 C 5. ABU g9 s9 -2?

2163--*Helenium amarum* (Raf.) H. Rock

Asteraceae <Helenieae>: *Helenium amarum* (var. a.; *tenuifolium*)

After settlement, this bitter grazing-repellant annual (2n = 30) spread north and east from its original range in Tex., La. and Ozarkian regions (Cr, Y, W and their citations). It was first recorded from Ky. during the 1930s (Harvill 1941, B), and is now a widespread weed of overgrazed areas.

ALI W. HAB GR-10,9 ::: C 6. ABU +5.

2164--*Dyssodia papposa* (Vent.) A.S. Hitchc.

Asteraceae <Helenieae>: *Dyssodia papposa*

In Ky. most records of this southwestern species date from 1900-1950; see especially Harvill (1941) and colls. at KY (Agr.). It is a fetid grazing-repellant annual (2n = 26) that may have been associated with sheep farming, which declined greatly after 1950.

ALI W. HAB G-10 ::? C 6. ABU +4<.

2165--*Polymnia canadensis* L.

Asteraceae <Polymnieae>: *Polymnia canadensis*

This widespread species of east-central states is usually associated with rocky woods on limestone, but in Ky. some populations occur on sandstone (as in CRIT with loess above) or shale (as in LESL but probably base-rich).

HAB 11,5 (+) D 2. ABU g9 s9 -2.

2166--*Polymnia canadensis* L. var. *radiata* Gray T

Asteraceae <Polymnieae>: *Polymnia canadensis* var. *radiata*

This is tentatively recognized here, but it is often considered just a form (Y) or ignored (FNA 21). In Ky. colls. have been referred to this taxon from slopes along or near the Kentucky Rv. in CLAR, ESTI, JESS, MERC and OWEN (mostly colls. at KY); also from EDMO (B) and PIKE (M). Their degree of distinction needs further analysis. More distinct plants in c. Tenn., n. Ala., and

nw. Ga. (Sm, F; D. Estes, pers. comm.) have larger discs and rays, which are pure white (versus creamy-white); see photo of Jeff McMillian in PL.

HAB 11,5 D 2. **ABU** g7? s7? -2.

2167--*Polymnia laevigata* Beadle

Asteraceae <Polymnieae>: *Polymnia laevigata*

This globally rare species is known only from a few disjunct localities on terraces and bluffs along the lower Ohio Rv. (Ky.), central Mississippi Rv. (Ky., Mo. Tenn.), central Tennessee Rv. (Tenn., Ga., Ala.), one in c. Ala. and one in nw. Fla.

HAB 4,7 E 2. **ABU** g5 s2 -5.

2168--*Smallanthus uvedalius* (L.) Mackenzie ex Small

Asteraceae <Polymnieae>: *Smallanthus* [*Polymnia*] *uvedalius*

Broadly defined, this species is widespread across southeastern North America and Central America. The coll. from CARL (MUR) is referable to var. *densipilis* Blake (within *Polymnia*), but that largely western segregate has not generally been recognized in recent treatments (F, W and citations). [Note that distinction of *Smallanthus* from *Polymnia* is now widely accepted; typically, $2n = 32$ versus 30 (FNA 21).]

HAB 8,7,4 D 4. **ABU** g9 s9 -3.

2169--*Silphium perfoliatum* L.

Asteraceae <Polymnieae>: *Silphium perfoliatum* (var. p.)

This is a widespread, largely midwestern species. It is usually associated with thin riparian woods and edges, and it prospers locally in derived farmland, where its tall stems can push through thickets and vines along weedy gullies, ditches and fencerows. But like most perennial *Heliantheae* of better soils, it appears to have been much reduced by livestock. There is subtle variation across the range of this species, which needs further analysis (Y).

Some authors (e.g. Cr, FNA 21, W) have distinguished plants named *S. connatum* L. or *S. perfoliatum* var. *connatum* (L.) Cronq. These have more pubescence (especially on the stems), leaves less narrowed to a petiolar base, and heads usually bearing only ca. 8 or 13 rays (versus 21 or 34). *S. connatum* is known from central Appalachian regions (W.Va., Va., N.C.), including the Kanahwa Rv. and New Rv. valleys of s. W.Va. (SC), and it may be expected along the Big Sandy Rv. in Ky. (Michaux 1803; M).

HAB 4,6,7 E 4. **ABU** g9 s8 -4.

2170--*Silphium integrifolium* Michx.

Asteraceae <Polymnieae>: *Silphium integrifolium*

This widespread, largely midwestern species is best distinguished by its relatively large heads (usually with 16-35 rays versus 6-14), together with its strictly opposite, sessile, broad-based and often slightly clasping leaves (Cr). Its circumscription deserves further revision; segregates remain uncertain; and there has been much confusion with *glabrum* or other species (G. Nesom, pers. comm.). Most or all colls. in Ky. may be assigned to the relatively hairy var. *integrifolium*. Extremely hairy forms have sometimes been misidentified as *S. asteriscus* L.; see notes under *trifoliatum*.

A few colls. match the more western var. *laeve* Torr. & Gray, assigned by G. Nesom (pers. comm.) to *S. trachopus* Raf. (= *S. speciosum* Nutt.), which is more glaucous, less hairy and tends to have larger heads: e.g. W.H. Martin 7-22-78 from LOGA (see also BA and J). Also, Harvill (1941) reported var. *deamii* Perry (from GRAV), which has glandular phyllaries, and var. *gattereri* Perry (based on the coll. from SIMP at KY-Agr.), which is known from c. Tenn. and appears closer to *S. glabrum* (Ch; R. Kral & D. Estes, pers. comm.). Records from LIVI (MUR) and MUHL (JC) are based on apparent hybrids with *glabrum* or *trifoliatum*. Note that $2n = 14$ in most or all *Silphium* species, and hybrids are often suspected (Cr, FNA 20, Y).

HAB 10,8 C 4. **ABU** g8 s7 -5.

2171--*Silphium asperrimum* Hook. T

Asteraceae <Polymnieae>: *Silphium asperrimum* ("radula")

This species has been confused with several other taxa, and must be reassessed across southeastern states (Sm, F; G. Nesom, pers. comm.). Though originally known mostly from Tex. and Okl., it extends east to c. Tenn., Ala. and n. Ga. (TENN), and it may be expected in western Ky.

S. asperrimum resembles more hairy forms of *integrifolium* (*radula* of Cr) or *asteriscus* (e.g. FNA 21). Like *integrifolium*, its involucre bracts have pubescent surfaces, and it has mostly sessile, cordate-clasping leaf-bases. It differs from *asteriscus* (sensu lato) in its achenes, which have relatively broad ca. 2 mm wings and deep 2-4 mm sinuses (as in *integrifolium*); its leaves are harshly scabrous-hispid (versus usually thinly scabrous-hispid to glabrous), mostly opposite below to alternate above (versus whorled to opposite); its stems have spreading hairs up to 1+ mm long (versus mostly hispid to almost glabrous and often glaucous).

2172--*Silphium glabrum* Eggert ex Small

Asteraceae <Polymnieae>: *Silphium glabrum* (laevigatum, asteriscus/trifoliatum var. latifolium*)

Although species status for *glabrum* is reasonable (Sm; G. Nesom, pers. comm.), there has been much confusion with *trifoliatum* or *integrifolium*, both of which appear to intergrade with *glabrum*. Uncertain records mapped here (open dots) are based on apparent transitions to *trifoliatum*. *S. glabrum* tends to occur in relatively shady mesic habitats, mostly in calcareous regions of the southern Appalachians, southern Interior Low Plateaus, and central Coastal Plain (Miss. to Ga.), extending north to s. Ind. (D, GH!), c. Ky., w. Va. and perhaps W.Va. (FNA 21).

Compared to typical *trifoliatum*, larger leaves are mostly 4-7 cm wide (versus 1-4 cm) with l/w of 2-3.5 (versus 4-6), broadly cuneate to truncate (versus tapering to a generally less distinct petiole), subentire (versus usually serrate), and all opposite (versus mostly in whorls of 3). Lower leaf surfaces and stems tend to be less scabrous-hispid to glabrate, but this is not diagnostic; stems are largely glabrous. Plants tend to be shorter (ca. 1-1.5 m versus 1.5-2 m), with more compact inflorescences, the longest peduncles at each node mostly ca. 2-5 cm (versus 5-10 cm).

HAB 7,11,1,10 D 3. **ABU** g8? s5? -3?

2173--*Silphium trifoliatum* L.

Asteraceae <Polymnieae>: *Silphium trifoliatum* (asteriscus var. t.)
Circumscription of *S. asteriscus* L. has varied; see also notes under *aserrimum* and *glabrum*, which have also been combined in some past treatments. *S. trifoliatum* may just be a northern segregate, and was combined as *S. asteriscus* var. *trifoliatum* (L.) J.A. Clevinger in FNA 21. It occurs mostly in the Interior Low Plateaus and the valleys of Appalachian regions.

Typical *asteriscus* reportedly (Sm) has opposite leaves below the inflorescence; in *trifoliatum* these leaves are mostly in whorls of 3 (4), but sometimes opposite (and rarely alternate). Its leaves are often elliptic (versus just lanceolate); plants generally have rougher, scabrous or hispid pubescence (versus scabrous or, especially on stems, glabrous); heads tend to have more numerous, smaller rays. Typical *asteriscus* has a southeastern range, centered on the eastern Piedmont (RAB), but extending west perhaps as far as Tenn. and Miss. (Cr, Sm). Although it has been reported from Ky. (Harvill 1941; BA; FNA 21), no clearly identified colls. have been seen.

Plants mapped here as *trifoliatum* do vary considerably, sometimes with leaves mostly opposite, and often with rougher pubescence in western regions, where perhaps transitional to *asteriscus*. Some eastern plants have been referred to var. *latifolium* Gray (F), but that name appears now to be a synonym of *S. glabrum* (Cr, FNA 21; G. Nesom, pers. comm.). There has been no clear separation of smooth versus hairy segregates of *trifoliatum* in Ky., after removal of *glabrum*, and records are combined here pending further analysis.

HAB 10,8,12 D 4. **ABU** g8 s8 -3.

2174--*Silphium wasiotense* M. Medley

Asteraceae <Polymnieae>: *Silphium wasiotense*

This recently described species (Medley 1989) is known only from the central Appalachian Plateaus in e. Ky., mostly along headwaters of the Kentucky Rv., and in some disjunct localities of the Ridge-and-Valley region in ne. Tenn. (Ch, W and citations). It typically occurs on lower slopes in thin woods and edges, especially along roadsides with warm sunny aspects. It prospers in adjacent woods only after fires or other disturbances.

The closest relatives of *wasiotense* are probably *S. brachiatum* Gattinger and *S. mohrii* Small, both of which have small ranges centered on the southern Cumberland Plateau in Ala. and Tenn. Before its description, *wasiotense* was also referred to *S. dentatum* Ell. (a southeastern segregate of *S. asteriscus*), or to *S. incisum* Greene (an obscure plant known only from the type in the Ridge-and-Valley of Ga.).

HAB 8,7,11,5 C 3. **ABU** g5 s5 -2.

2175--*Silphium laciniatum* L. var. *robinsonii* Perry

Asteraceae <Polymnieae>: *Silphium laciniatum* var. *robinsonii*

This taxon occurs mostly in or near the lower Mississippi Valley (Cr, FNA 21). In Ky. it is a remnant of original grasslands, surviving mostly in roadsides; extensive populations are restricted to Fort Campbell in TRIG and adjacent Tenn. (Chester 1992). Typical var. *laciniatum* occurs mostly in the midwest and is unknown in Ky., though a coll. from CALL (US) appears transitional. See also notes on potential hybridization under *pinnatifidum*.

HAB f-10,12 C 5. **ABU** g7 s6 -5.

2176--*Silphium pinnatifidum* Ell.

Asteraceae <Polymnieae>: *Silphium pinnatifidum* (terebinthaceum var. p.)

This has a rather narrow range, mostly in the Big Barrens region of Ky. and Tenn., plus outlying populations in Ala. and Ga. It may not occur north of the Ohio Rv. (D). Similar plants in Ind. and Ohio can be interpreted as forms of *terebinthaceum*, perhaps introgressed with *laciniatum*. *S. pinnatifidum* survives mostly in lower edges of limestone glades, roadsides on deeper soils, and locally old hayfields or pastures with moderate rough browsing; horses generally do not eat it (R. Seymour, pers. comm.).

Further research is needed to clarify distinction among various hybrids and introgressants involving this species and others. Apparent hybrids with typical *terebinthaceum* have been collected from HART and WARR (MM for WKY). Apparent hybrids with *laciniatum* have been collected from LOGA (B) and perhaps TRIG (APSU). Typical *terebinthaceum* tends to flower a month or so later than *laciniatum* (peaking in Sep versus Aug), but there is much overlap.

HAB f-10,12 D 5. **ABU** g6 s6 -5.

2177--*Silphium terebinthaceum* Jacq. var. *terebinthaceum*

Asteraceae <Polymnieae>: *Silphium terebinthaceum* var. *t.*

This occurs mostly in the upper midwest, but with disjunct populations in some regions of southeastern states that have a history of pre-DeSota grassland (Braun 1950; K, W). There may be some hybridization with *laciniatum* and *pinnatifidum*; see notes under those species. Further southeast, from the Ridge & Valley to the Piedmont and Coastal Plain, *terebinthaceum* is largely replaced by the related species (or species complex), *S. compositum* Michx.

HAB f-10,9,12 D 5. **ABU** g7 s6 -5.

2178--*Silphium terebinthaceum* Jacq. var. *luciae-brauniae* Steyermark

Asteraceae <Polymnieae>: *Silphium terebinthaceum* var. *luciae-brauniae*

This taxon was described from the Knobs and other hills just west of the Appalachian Plateaus in n. Ky. and se. Ohio (F), and it also seems to occur locally from n. Miss. to n. Ga. (pers. obs.). Var. *luciae-brauniae* is identified simply by its glabrous upper leaf surfaces (versus scabrous), but some colls. in the western Knobs are not clearly distinct. Apparent hybrids with *trifoliatum* have been collected from FLEM (EK) and ROWA (JC).

Based on label data, var. *luciae-brauniae* appears to have been locally abundant as late as 1920-1950 in the calcareous or dolomitic foothills between the eastern Knobs and western Bluegrass region, where narrow strips of

grassland occurred before settlement. Although there are virtually no intact remnants of that vegetation, this *Silphium* and other conservative associates do survive in a few rights-of-way and old fields that have not been converted to fescue or subjected to intense browsing. There are also scattered patches below limestone cliffs within the Knobs.

HAB f-10,9,12 D 5. **ABU** g5 s5 -5.

2179--*Chrysogonum virginianum* L. var. *brevistolon* Nesom

Asteraceae <Polymnieae>: *Chrysogonum virginianum* var. *brevistolon*

This is generally considered to be a monotypic species, but with distinct segregates; $2n = 16$ and 32 (FNA 21). Var. *brevistolon* is a southern Appalachian taxon was recently described by Nesom (2001a). It has moderately long stolons, ca. 2-6 cm; early flowering stems are leafless, ca. 2-25 cm tall; later ones are leafy, ca. 15-25 cm tall.

Var. *virginianum* is essentially non-stoloniferous, with later leafy flowering stems often taller, and more eastern. The latter was mapped close to Ky. by Nesom, and within Ky. by FNA 21 but no colls. are documented. The highly distinct var. *australe* (Alexander ex Small) Ahles is strongly stoloniferous and has short leafless flowering stems; it has a more southeastern, disjunct range.

HAB 5 C 1. **ABU** g7 s3 =.

2180--*Parthenium integrifolium* L.

Asteraceae <Heliantheae>: *Parthenium integrifolium*

This is a widespread eastern species, but in Ky. it is largely restricted to regions where open woodland or grassland was maintained by fire before settlement. *Parthenium* has a remarkably clearcut northern limit in Appalachian regions; it remains unknown in PULA, ROCK, LAUR, KNOX and BELL. This limit may reflect the northern extent of more open fire-maintained woodland before settlement (Campbell et al. 1991).

Several segregates have been described within this polyploid species ($2n = 72$), but they have not generally been recognized in recent treatments (M, FNA 21). These include the relatively large-headed, hairy and rhizomatous *P. hispidum* Raf., which should be investigated further (Mears 1975; Y). *P. hispidum* is largely midwestern, but reported also from Ill. and Tenn. The closely related *P. auriculatum* Britt. is reported from central Appalachian regions on calcareous soils; its basal leaves are relatively small and its cauline leaves are auriculate-clasping (W).

Rafinesque (1836, 2:25-26) described three additional taxa in *Parthenium* of Ky. that not become recognized at all by later authors: (1) *angustifolium*, "In the barrens or glades of West Kentucky"; (2) *pumilum*, "In the mts. Wasoto or Cumberland"; (3) *amplectans*, "Glades of Kentucky." Did these perhaps match *hispidum*, *auriculatum* and *integrifolium* (sensu stricto), respectively?
HAB 10,12,8 B 4. **ABU** g10 s7 -4.

2181--*Iva annua* L.

Asteraceae <Heliantheae>: *Iva annua* (ciliata)
This is a common annual weed of the central and lower Mississippi Valley and elsewhere in central North America. It is probably adventive in some eastern states but appears native in Ky. A large-seeded selection was widely cultivated in east-central states for food by native people during the Woodland period, ca. 2000-4000 years ago (Ford 1985, Smith 2006). Based on fossils, those plants were named var. *megacarpa* (Blake) R.C. Jackson, but they now appear to be extinct (St, M, W).

HAB f-9,6,1 ::: D 6. **ABU** g9 s8 +1?

2182--*Cyclachaena xanthiifolia* (Nutt.) Fresen. W

Asteraceae <Heliantheae>: *Cyclachaena* [*Iva**] *xanthiifolia*
This widespread western annual is occasionally adventive in east-central states. In contrast to *annua*, its heads are not subtended by bracts (and $2n = 36$ versus 34). In Ky. only one coll. has appeared, made by C.L. Renaker in 1919 from Dry Ridge in GRAN (KY-Agr.). The spelling *xanthifolia* is incorrect (Y).

ALI W.

2183--*Ambrosia trifida* L.

Asteraceae <Heliantheae>: *Ambrosia trifida* (var. t.)
This tall annual is widespread in temperate regions of North America. It is generally known as "giant ragweed" but the old common name "buffalo-weed" (F) suggests a prehistoric association with ungulates. It is often browsed by deer. In 1914 Gm called it "horse-weed... often cut for horses, and said to be a remedy for slobbering... sometimes cured and ground for feed... being rich in nitrogenous material." There is also evidence that seeds were eaten, cultivated and even selected for larger size by native people in some regions (as cited by Y); see also Ford (1985).

Varieties have been described, but the species is considered relatively uniform ($2n = 24$) and hybrids have not been documented in Ky. Var.

integrifolia (Muhl.) Torr. & Gray was reported from BALL by Anderson (1947; check Iowa State Univ.). Var. *texana* Scheele could be expected as an adventive from the southwest, but the only Ky. report appears to have been erroneous (M).

HAB f-10,7,4 ::: D 6. **ABU** g10 s10 +3.

2184--*Ambrosia bidentata* Michx.

Asteraceae <Heliantheae>: *Ambrosia bidentata*
This weedy annual ($2n = 34$) is widespread in central states and more local in southeastern states, where it may be partly adventive.

HAB f-10,12 ::: D? 6. **ABU** g9 s8 +2.

2185--*Ambrosia artemisiifolia* L. var. *elatior* (L.) Descourtils

Asteraceae <Heliantheae>: *Ambrosia artemisiifolia*
This variable species ($2n = 34, 36$) is widespread across temperate regions of North America. Segregates have been described, but none have been recognized in recent treatments. All plants in Ky. would be referable to var. *elatior* (L.) Descourtils, following F. Var. *artemisiifolia* is native to the northeastern Coastal Plain, and remains unknown in Ky., despite some reports (M). The southern var. *paniculata* (Michx.) Blank. is more likely, and has also been reported (BA) but not confirmed.

HAB f-10,12 ::: D 6. **ABU** g10 s10 +3.

2186--*Xanthium strumarium* L. var. *canadense* (P. Mill.) Torr. & Gray

Asteraceae <Heliantheae>: *Xanthium strumarium* var. *canadense* (pennsylvanicum, italicum)
This cosmopolitan species may have originated in warmer American regions. In addition to being common in fields, it is locally abundant on exposed drying muddy banks of larger rivers and sloughs. Although sometimes considered adventive or even alien in southeastern states (e.g. SE), it was probably present and locally abundant at the time of settlement (Short et al. 1833; Gm). The large edible seeds of this plant were greedily consumed by Carolina Paroquets, as recorded in several early accounts from the Ohio Valley and elsewhere (e.g. Audubon 1840, Beckner 1928).

Appropriate treatment of intraspecific variation remains uncertain (F, Cr). FNA 21 did not recognize any varieties, and listed only $2n = 36$. Included here under var. *canadense* are plants formerly filed under *X. pennsylvanicum* Wallr., *X. italicum* Moretti or other obscure names (including *commune* and *saccharatum*). Var. *canadense* is diagnosed here by its relatively large burs

with lower parts of prickles spreading-hairy (Cr), but identification here remains tentative in several colls. Typical var. *strumarium* is supposedly native to tropical America and perhaps southern Europe. It occurs rarely as a waif in northeastern states (Cr); records from Ky. are dubious (M).

HAB f-10,9,1? ::: D 6. **ABU** g10 s9? +3.

2187--*Xanthium strumarium* L. var. *glabratum* (DC.) Cronq.

Asteraceae <Heliantheae>: *Xanthium strumarium* var. *glabratum* (chinense, globosum, orientale, pungens)

This taxon is distinguished only by its glabrous fruits; see notes under var. *canadense*. As mapped here, it includes insignificant variants formerly known under *X. chinense* Mill., *X. globosum* Shull, *X. orientale* L. or other names.

HAB f-1,9,10? ::: D 6. **ABU** g10 s10? +3.

2188--*Xanthium spinosum* L.

Asteraceae <Heliantheae>: *Xanthium* <*Acanthoxanthium*> *spinosum*

This cosmopolitan weed of tropical to warm temperate regions has been widely recorded across North America, at least as an occasional adventive. But it is now common only in western regions, and rare in southeastern states (FNA 19, K, PL, W). Almost all Ky. records date from 1840 to 1940, with perhaps none after 1950 (M). Short (1840) noted: "A pestiferous species of cockle-bur, which, it is to be feared, will become extensively naturalized. As yet, I have only met with it on the commons of Portland, below the falls of the Ohio." In 1914, Gm noted: "frequent throughout the western half of the State, and it is noticeable among our species of cockleburs because of its large, yellow, three-forked spines, the latter often as much as three-fourth inch in length." Was the disappearance of this species perhaps associated with the decline of sheep or other changes in farming?

ALI S? **HAB** G-10 ::: D? 6. **ABU** +4<.

2189--*Inula helenium* L.

Asteraceae <Inuleae>: *Inula helenium*

This cultivated species ("elecampane") was apparently established in the past as an occasional escape from cultivation, but it has not been collected since 1940. It has ancient medicinal uses, with camphoraceous chemistry somewhat like the distantly allied genus *Pluchea* but much more pleasant; $2n = 20$ in both (FNA 20). [*Pluchea* was separated into tribe *Plucheeae* by FNA, and the remaining traditional *Inuleae* were treated as *Gnaphalieae*.]

ALI EU. **HAB** H-10 D? 5. **ABU** +4.

2190--*Pluchea camphorata* (L.) DC.

Asteraceae <Inuleae>: *Pluchea camphorata*

This is widespread in wetlands of southeastern states, but generally absent from cooler regions. In Ky. it is rare to absent in the Bluegrass, Knobs and northern Appalachian Plateau.

HAB f-9,2 D? 5. **ABU** g9 s8 -3.

2191--*Packera glabella* (Poir) C. Jeffrey

Asteraceae <Senecioneae>: *Packera* [Senecio] *glabella*

This weedy southeastern annual may have been present in Ky. at the time of settlement. Short (1837) noted it under the name *Senecio lobatus* Pers., "seems to be abundant on the lower Mississippi, has been found by Mr. Griswold at Louisville; but we believe has not been seen higher on the Ohio." However, neither Gm nor B listed it. After 1940, *glabella* seems to have increased much and spread towards the east, especially in or near areas cleared and drained for corn and soybean fields. It is now a locally abundant weed in many lowlands.

ALI w. **HAB** H-10,6,4 ::: D 6. **ABU** g9 s9 +3?

2192--*Packera aurea* (L.) A. & D. Löve

Asteraceae <Senecioneae>: *Packera* [Senecio] *aurea*

This is widespread in thin damp woods and edges across eastern North America, except on most of the southeastern Coastal Plain. *P. aurea* is a diploid ($2n = 44$) that appears to form occasional hybrids with *anonyma* and other species (FNA 20); see also notes under *obovata*.

HAB 4,6,7,8 C 3. **ABU** g10 s10 -3.

2193--*Packera obovata* (Muhl. ex Willd.) W.A. Weber & A. Löve

Asteraceae <Senecioneae>: *Packera* [Senecio] *obovata* (*aurea* var. o.)

This ranges across east-central states in moderately dry woods on base-rich soils, but it is rare on the coastal plains. *P. obovata* includes diploids and tetraploids ($2n = 44, 88, 90$), but it is not known to form hybrids.

Some colls. from Ky. (e.g. CLAR at KY, GH) are referable to the relatively southern var. *rotundus* Britt. (in *Senecio*), which differs in its basal leaves suborbicular to round-obovate (versus obovate), with petiole ca. 1-3 x blade length (versus 0.5-1.5), the dilated summit ca. 3-15 mm (versus 10-30 mm). That variety appears transitional to *aurea* in a few cases. However, *obovata* is almost always distinguishable by its heads with more abruptly acuminate phyllaries, ca. 3-6 mm long (versus narrowly linear, ca. 6-8 mm), and less

deeply yellow flowers; its basal leaves with non-cordate bases (versus cordate); and its rosettes formed on elongate stolons as well as rhizomes (versus just rhizomes).

HAB 5,11,7 D 2. **ABU** g10 s10 -2.

2194--Packera anonyma (Wood) W.A. Weber & A. Löve

Asteraceae <Senecioneae>: *Packera* [Senecio] *anonyma* (S. smallii)

This is a common, somewhat weedy species on dry acid soils in southeastern states, but only east of the Mississippi Rv.

HAB f-10,12,7 C 4. **ABU** g9 s9 +1?

2195--Packera paupercula (Michx.) A. & D. Löve ?

Asteraceae <Senecioneae>: *Packera* [Senecio] cf. *paupercula* (?S. crawfordii) In Ky. this name has been applied to plants on damp soils of sandstone cobble bars along the Cumberland Rv. (mouth of Bunches Cr. in WHIT) and its Big South Fk. (at Big Shoals in MCRE). However, circumscription of this widespread northern species and its segregates remains somewhat uncertain, and further revision is expected (Mahoney & Kowal 2008). In southeastern states, typical *paupercula* may be largely restricted to seasonally dry base-rich soils (W). The name *Senecio crawfordii* (Britt.) G.W. & G.R. Douglas has been applied to a rare segregate that occurs in "bogs and fens" of eastern states, centered in Appalachian regions (W).

HAB 1 + C 5. **ABU** g10 s2 -1.

2196--Packera paupercula (Michx.) A. & D. Löve var. pseudotomentosa (Mackenzie & Bush) R.R. Kowal

Asteraceae <Senecioneae>: *Packera* [Senecio] *paupercula* var. *pseudotomentosa* ("plattensis")

These midwestern plants were recently described by Mahoney & Kowal (2008). They were previously referred to the largely western *P. plattensis* (Nutt.) W.A. Weber & A. Löve, which has been confused with the largely northern *P. paupercula* var. *paupercula*. Both species have been considered widespread and intergradient (Cr, Y). Three Ky. colls. are tentatively mapped here: (1) from the Blue Licks in ROBE (probably a coll. of C.W. Short at CINC; B); (2) from the prairies of LEWI (M. Medley #19401-91 for WKY, and J. Campbell s.n. for KY); and (3) "plattensis" from "dry limestone slopes" in PULA (B, recheck at US). *P. plattensis* was also reported from CASE by Murphy (1970) but the coll. has not been found at KY: "south side of Green River, old roadbed 3-4 miles south of Liberty."

HAB 12? +? E? 5. **ABU** g9 s2 -5.

2197--Senecio vulgaris L.

Asteraceae <Senecioneae>: *Senecio vulgaris*

This annual weed is widely scattered across temperate regions of North America. It was first found in Ky. during the 1980s (M). It is spreading, often in association with fresh ornamental plantings from nurseries.

ALI EU. **HAB** H-10 ::: D 6. **ABU** +4.

2198--Hasteola suaveolens (L.) Pojark.

Asteraceae <Senecioneae>: *Hasteola* [Senecio] ("Cacalia") *suaveolens*

This is widely distributed on damp fertile soils in east-central states, but curiously rare to absent in some of the most productive regions, such as the Bluegrass and Nashville Basin (Ch). Historic declines seem to have occurred across large eastern sections of its range (FNA 20, W). There are few records from Ky., Ind. or Ill. after 1950-1970 (Anderson 1994). The increasingly imperiled status of this lowland perennial is presumably due to woodland clearance, associated farming and livestock.

H. suaveolens may be generally more palatable than *Arnoglossum* to large herbivores (Anderson 1994); $2n = 40$ (versus 50-56). It can spread by slender rhizomes, forming large weedy patches in gardens (D, St). However, its widely spreading fleshy roots may be highly sensitive to drought, damage or fungus during the growing season, since plants can decline or die within 20-30 days after such shocks (in repeated experience of JC).

Hasteola has been recently revived as a genus, containing only *suaveolens* and the disjunct endangered species in Fla., *H. robertianum* L.C. Anderson (Anderson 1994, FNA 20). However, subsequent research has shown that this genus is "deeply embedded" within a redefined *Senecio* (Pelser et al. 2007), and the name *S. suaveolens* (L.) Ell. has now been followed by W.

HAB 4,6 D 4. **ABU** g6 s1? -6?

2199--Arnoglossum plantagineum Raf. R

Asteraceae <Senecioneae>: *Arnoglossum* [Cacalia] *plantagineum* (C. tuberosa)

This is widely distributed in midwestern regions, and occurs in some counties of Ill. and Ind. that are adjacent to Ky, also c. Tenn. It is uncommon to rare or absent in southeastern states. No colls. from Ky. have been located, but there are old reports by Rafinesque (1820, 1824) from "knob hills of Ky."; by Greenwell (1935, Gunn 1968b) from NELS; and by FNA 20. *A. plantagineum*

appears to have been associated with tall grasslands on damp base-rich soils, which are now generally converted to farmland.

2200--*Arnoglossum reniforme* (Hooker) H.E. Robins.

Asteraceae <Senecioneae>: *Arnoglossum* [*Cacalia*] *reniforme* (*muhlenbergii**)

This is widely scattered across east-central states but perhaps most frequent in the southern Appalachians (W). It is generally restricted to partial shade or edges in mesic to submesic woods on fertile soils. Its virtual absence from the Bluegrass region, much of the Mississippian Plateaus and the Nashville basin (Ch) suggests excessive past influences of browsing or burning in those regions. See FNA 20 for notes on nomenclature.

HAB 5,7 D 3. **ABU** g9 s8 -2.

2201--*Arnoglossum atriplicifolium* (L.) H.E. Robins.

Asteraceae <Senecioneae>: *Arnoglossum* [*Cacalia*] *atriplicifolium*

In morphology, ecology and range, this species is similar to *reniforme*; but $2n = 50, 52$ and 56 (versus just 50). It is generally more common throughout central and southern Appalachian regions to the mid-west. It typically occurs on drier or less fertile soils, and it appears more tolerant of disturbance or even light-demanding. Cr reported hybridization, but there does not appear to be definitive evidence (FNA 20).

HAB 7,11 C 4. **ABU** g9 s9 -2.

2202--*Tussilago farfara* L.

Asteraceae <Senecioneae>: *Tussilago farfara*

This weed of damp seepy acid soils has become locally abundant in Appalachian regions of North America, especially at the base of road cuts through shales. It spread south from northeastern states; the first coll. from Ky. is dated 1981 (at EKY). The related species, *Petasites frigidus* (L.) Fries, was erroneously reported from Ky. by BA (M).

ALI EU. **HAB** R-9,6 :: C 4. **ABU** +6.

2203--*Erechtites hieraciifolia* (L.) Raf. ex DC.

Asteraceae <Senecioneae>: *Erechtites hieraciifolia*

This is a widespread weedy annual from eastern North America to South America.

Some colls. can be referred to var. *intermedia* Fern., but that taxon is not recognized in recent treatments. These include an unusual coll. from BULL (DHL) with small broad leaves.

HAB H-8,11,10 :: C 6? **ABU** g10 s10 -1?

2204--*Vernonia noveboracensis* (L.) Michx.

Asteraceae <Vernonieae>: *Vernonia noveboracensis* (var. n.)

This occurs on wet acid soils in southeastern states from the Atlantic Coastal Plain to Appalachian regions. Colls. from MCRE and WHIT (KY) are relatively homogeneous, but a few suggest hybridization with *gigantea*. Colls. from MADI (BEREA), ROWA (KY), WARR (Pr) and WASH (KY) are more varied. Those from ROWA and WARR suggest transitions to *glauca*. The one from WASH has larger heads, more pubescent and resin-dotted. [There is frequent hybridization among species in this genus, which has uniform chromosome number; $2n = 34$ in all reports.]

HAB G-9 C 5. **ABU** g8 s7 -2.

2205--*Vernonia glauca* (L.) Willd. T

Asteraceae <Vernonieae>: *Vernonia glauca* (*noveboracensis* var. *tomentosa*)

This occurs mostly from the mid-Atlantic Coastal Plain to the Ridge-and-Valley, usually in low meadows but on drier ground than *noveboracensis*. *V. glauca* differs (Cr, FNA 19) in its "bright stramineous or pale tawny to nearly white pappus" (versus brownish-purple or sometimes merely dark-tawny), with outer bristles or scales grading into inner ones (versus distinct outer scales and inner bristles); leaves are relatively broad (with l/w usually 2.5-3.5 versus 4-6). There are no clear records from Ky., but there is an obscure unverified record from WARR (Pr, in handwritten addenda). Also, a more recent coll. from ROWA (KY) appears to be a hybrid between *gigantea* and *glauca*.

2206--*Vernonia gigantea* (Walt.) Trel.

Asteraceae <Vernonieae>: *Vernonia gigantea* (*altissima*)

This is widespread across eastern states, except New England. It has become by far the most common ironweed in east-central states, accumulating in old pastures due to unpalatability for livestock. The other species seem to have "suffered" somewhat from introgression or "contamination" with *gigantea* (Cr).

HAB G-10,9 D 5. **ABU** g10 s10 +1?

2207--*Vernonia missurica* Raf.

Asteraceae <Vernonieae>: *Vernonia missurica*

This is centered in the Ozark region, but extends east locally to Ind., Ky., Tenn., Ga. and Fla. Some colls. from Ky. may be introgressed with *gigantea*;

those from CHRI (MUR) and CRIT (KY) are clearly intermediates. Both *missurica* and the closely related *baldwinii* can be distinguished from *gigantea* (FNA 19) by their lower leaf surfaces, which are usually more pubescent, the hairs relatively erect and curled hairs (versus appressed, awl-shaped), and more conspicuously dotted with resin-glands (versus not or sparsely gland-dotted).

HAB G-10 D 5. **ABU** g9 s8 -3.

2208--*Vernonia baldwinii* Torr. T

Asteraceae <Vernonieae>: *Vernonia baldwinii*

This largely Ozarkian species is known nearby in Mo. and s. Ill. It is close to *missurica*, but has more hemispheric (versus somewhat urceolate) heads only ca. 4-6 mm high (versus 7-10 mm), with phyllaries more resin-dotted, usually more pointed and recurved, but highly variable (FNA 19). The only known Ky. coll. is from a roadside in CALL (SIU); reports from CARL and FULT were based on misidentified *missurica* (Mohlenbrock et al. 1966; SIU). *V. baldwinii* has also been reported from Ky. in BA (check EKY) and FNA 19. The coll. from CALL appears at least transitional to var. *interior* (Small) B.G. Schub.

2209--*Vernonia fasciculata* Michx. R

Asteraceae <Vernonieae>: *Vernonia fasciculata*

This midwestern species of wet prairies has been reported from Ky. (e.g. Jones 1972; FNA 19), with reference to colls. in BALL, HEND, WARR and perhaps elsewhere (M), but details of these colls. are not available. *V. fasciculata* does occur nearby in s. Ill. It differs from *gigantea* in its leaves glabrate below, with pits that contain awl-shaped hairs or glands (FNA 19). Jones included the coll. from HEND within the rather disjunct, northern ssp. *corymbosa* S.B. Jones (with relatively small scabrous leaves and shorter stems). However, that segregate has been hard to distinguish from hybrids between *fasciculata* and *gigantea* (St, Y), and it was not recognized in FNA.

2210--*Elephantopus carolinianus* Raeusch.

Asteraceae <Vernonieae>: *Elephantopus carolinianus*

This ranges widely across southeastern states. A somewhat weedy species, it is especially common in thin woods a few years after release from browsing or mowing. Species of *Elephantopus* in North America tend to form rosettes of basal leaves, which can resist ground disturbance. Although chromosome number is uniform ($2n = 22$), no hybrids are documented (FNA 21).

HAB f-7,8,10,6 :: D 3. **ABU** g10 s10 +1?

2211--*Elephantopus tomentosus* L.

Asteraceae <Vernonieae>: *Elephantopus tomentosus*

This occurs in warmer regions of southeastern states, usually on dry sandy soil in thin woods with a history of browsing or burning. In Ky. it is largely restricted to broader ridges of the southern Appalachian Plateaus.

HAB 7,8,10,11 :: B 3. **ABU** g8 s7 -2.

2212--*Hieracium venosum* L.

Asteraceae <Cichorieae>: *Hieracium* <*Stenotheca*> *venosum*

This is centered on Appalachians and mid-Atlantic states, with some disjunctions to south and west. In Ky. it is largely restricted to dry acid soils in Appalachian regions, with local extensions into hills around the Bluegrass. Varieties are not recognized in recent treatments. Most plants in Ky. are referable to the relatively northern var. *nudicaule* (Michx.) Farw., which has glabrous upper leaf surfaces. The southern var. *venosum* is scattered in central and eastern regions of the state, with little or no apparent difference in distribution or habitat. *H. venosum* can hybridize with *paniculatum* (forming X *scribneri* Small), *gronovii* (forming X *marianum* Willd.) and *scabrum*. *H. X scribneri* has been collected from MADI (named "*H. venosum* ssp. *scribneri* (Small) Garland ined." at GH); $2n = 18$ throughout sect. *Stenotheca*.

HAB 11,7 B 3. **ABU** g9 s9 -2.

2213--*Hieracium paniculatum* L.

Asteraceae <Cichorieae>: *Hieracium* <*Stenotheca*> *paniculatum*

This is a widespread northeastern species. In Ky. *paniculatum* is strictly Appalachian, usually occurring along dirt roads in mesic to subxeric upland woods.

HAB 7,11,8 B 4. **ABU** g9 s8 -2.

2214--*Hieracium scabrum* Michx.

Asteraceae <Cichorieae>: *Hieracium* <*Stenotheca*> *scabrum*

This has a broad northeastern range, similar to *paniculatum*, but occurs in more open habitats. *H. umbellatum* L., is a closely related northern (circumboreal) species that is unknown in or near Ky.; synonyms include *H. kalmii* L. and *H. canadense* Michx. (FNA 19, W). Short's (1840) report of *kalmii* may well have been based on *scabrum* (M).

HAB f-10,11,8 B 5. **ABU** g9 s8 -2?

2215--*Hieracium marianum* Willd. T

Asteraceae <Cichorieae>: Hieracium <Stenotheca> marianum ("traillii"; "greenii"*)

There have been several reports under this name (Short & Peter 1835; and citations of M), but colls. need location and verification. H. marianum is poorly understood but widely reported in southeastern states, apparently derived from hybrids of venosum and gronovii (W).

An allied taxon, H. traillii Greene, was also mapped in Ky. by FNA 19, but most potential records (M) are from colls. of B (US) that were initially named under the synonym, H. greenii Port. & Brit. (not to be confused with the true H. greenii Gray of western states). H. traillii probably has hybrid origin similar to marianum but is endemic to the shale-barren region of Pa., W.Va. and Va. (FNA 19). B's colls. of "greenii" may be referable to marianum, but initial examination suggests that they could just be interpreted as depauperate gronovii. They are from BATH, BOON, LAUR, LETC, MCRE, MENI and WOLF.

2216--Hieracium gronovii L.

Asteraceae <Cichorieae>: Hieracium <Stenotheca> gronovii
This is widespread in eastern states, except those adjacent to Canada, but it is largely restricted to open woodlands on dry acid soils. In Ky. gronovii is rare to absent in calcareous regions. Scattered colls. appear to be hybridized with venosum or, in fewer cases, paniculatum.

HAB f-10,8,11 B 4. **ABU** g9 s9 -3?

2217--Hieracium longipilum Torr.

Asteraceae <Cichorieae>: Hieracium <Stenotheca> longipilum
In Ky. this midwestern species is rare, mostly found in remnants of thin woodland or grassland on rather infertile, acid soils. It has been confused with gronovii, and hybrids may be expected (Y).

HAB 10,7 B 5. **ABU** g9 s4 -5.

2218--Pilosella caespitosa (Dumort.) Sell & C. West

Asteraceae <Cichorieae>: Pilosella [Hieracium*] caespitosa (pratense)
This weed is widespread in northeastern states and adjacent Canada. Species of Pilosella "belong to a huge polyploid-apomictic complex without clear specific boundaries" (Cr); $2n = 18, 27... 72$. All are disturbance-adapted perennials with rosettes of basal leaves produced at ends of rhizomes or stolons.

Some other European species of Pilosella have been reported, but not verified: P. piloselloides (Vill.) Sojak (BA), which differs from caespitosa in its less hairy, glaucous leaves; P. aurantiaca (L.) F. Schultz & Schultz-Bipontinus (Faller 1975), which has reddish-orange flowers; and P. officinarum F. Schultz & Schultz-Bipontinus (Faller 1975), which has solitary heads. Like caespitosa, these species are widely scattered in North America, and are expected in Ky.

ALI EU. **HAB** S-10 ::? C 6. **ABU** +4.

2219--Sonchus asper (L.) Hill

Asteraceae <Cichorieae>: Sonchus asper
This common annual diploid ($2n = 18$) is a widespread (cosmopolitan) weed. It has probably been present in Ky. since early after settlement (Short et al. 1833).

ALI EU. **HAB** H-10 :::: D 6. **ABU** +6.

2220--Sonchus oleraceus L.

Asteraceae <Cichorieae>: Sonchus oleraceus
This annual tetraploid ($2n = 32, 36$) is a widely scattered weed in temperate regions. It probably been present in Ky. since early after settlement (Gray 1864; Gm), but it has remained less abundant than asper. It may be more restricted to damp eutrophic soils, often in domestic or ruderal settings of little interest to most botanists. As observed in Mo. (St, Y), this species is undercollected and much more widespread than records indicate. In Ky. it tends to flower earlier than aspera, mostly in May-Jul (versus Jul-Sep), but both species can flower up until frost.

ALI EU. **HAB** H-10,7 :::: D 6. **ABU** +5.

2221--Sonchus arvensis L.

Asteraceae <Cichorieae>: Sonchus arvensis
This stoloniferous perennial is most common in more northern and western regions of North America, where it can be a persistent weed. Variation needs further study across its range; $2n = 36$ and 54 (FNA 19, Y). For Ky. the only records are colls. from JEFF (MM) and ROWA (MDKY). Both var. arvensis and var. glabrescens (Gunth.) Grab. & Wimmer (= ssp. uliginosus (M. Bieberteini) Nyman appear to be represented from ROWA.

ALI EU. **HAB** H-10 :::: D 6. **ABU** +4.

2222--Lactuca saligna L.

Asteraceae <Cichorieae>: Lactuca saligna

This weed is widely scattered across North America, especially on base-rich soils.

It was first reported from Ky. in 1914, when Gm noted: "A small patch of this weed has recently been noted at the edge of Lexington." It is now widely scattered across the state, except in more hilly regions.

ALI EU. **HAB** H-10 ::: E? 6. **ABU** +5.

2223--*Lactuca serriola* L.

Asteraceae <Cichorieae>: *Lactuca serriola* ("scariola")

This weed is widespread across North America. It has probably been present in Ky. since the mid-1800s or before (Gray 1864); it was "common everywhere" in 1914 (Gm).

ALI EU. **HAB** H-10,12 ::: D 5. **ABU** +6.

2224--*Lactuca sativa* L. C

Asteraceae <Cichorieae>: *Lactuca sativa* (*serriola* var. *integrata*/forma *integrifolia*)

This abundantly cultivated species (lettuce) does not seem to become truly established in wilder lands of North America. There are a few rather obscure or dubious records of escapes from Ky. (M). Plants known as *L. serriola* var. *integrata* Gren. & Gordon may result from hybridization of *sativa* and *serriola* (Cr). These and other Eurasian aliens in North America are diploids ($2n = 18$), whereas native species of *Lactuca* are tetraploids ($2n = 38$). However, there is little documentation of hybrids between species within these generic divisions (Cr, FNA 19).

ALI EU.

2225--*Lactuca floridana* (L.) Gaertn.

Asteraceae <Cichorieae>: *Lactuca floridana* (*villosa*)

This annual or biennial is widespread in moist to damp woods across eastern states except the northeast. Many colls. from Ky. are referable to var. *villosa* (Jacq.) Cronq., but that taxon is not recognized in recent treatments and it does not seem to differ in distribution.

HAB 7,8,4 ::? D 3. **ABU** g10 s10 -2.

2226--*Lactuca biennis* (Moench) Fern.

Asteraceae <Cichorieae>: *Lactuca biennis* ("spicata")

This tall annual or biennial (often up to 3 m in Ky.) is widespread in submesic woodlands, thickets and edges from northeastern to Pacific states, but absent

in the lower Ohio and lower Mississippi watersheds. Records of forma *integrifolia* (Torr. & Gray) Fern. are included here.

HAB f-8,7,4 ::? D 4. **ABU** g10 s8 -3.

2227--*Lactuca canadensis* L.

Asteraceae <Cichorieae>: *Lactuca canadensis*

This largely biennial weed is widespread across temperate North America. Although leaves vary much, no associated segregates are generally recognized (FNA 19). Included here are var. *integrifolia* (Bigelow) Gray, var. *latifolia* Kuntze, var. *longifolia* (Michx.) Farw. and var. *obovata* Wieg. of older treatments (e.g. F.).

HAB F-10 ::: D 6. **ABU** g10 s10 -1?

2228--*Lactuca hirsuta* Muhl. ex Nutt. R

Asteraceae <Cichorieae>: *Lactuca hirsuta*

This largely biennial species is widely scattered across eastern states, especially to the north, with var. *hirsuta* "very local and little known", and the smoother var. *sanguinea* "locally abundant" in "dry open woods and clearings" (F). In Ky. it has been reported as var. *sanguinea* (Bigelow) Fern. from CARL (Wilson 1976), HART (D. Boone, pers. comm.) and NELS (Greenwell 1935), but no colls. have been seen (M). It was also mapped in the state by FNA 19, with no recognition of varieties. Further research is needed to document this somewhat neglected species, which differs from *canadensis* in its larger heads, with involucre 15-22 mm (versus 10-15 mm) and achenes 7-10 mm long including the beak (versus 4.5-6 mm); leaves tend to be more basally disposed; stems are often hairy but also be glabrous (Cr, FNA 19, Y).

2229--*Lactuca ludoviciana* (Nutt.) Riddell W

Asteraceae <Cichorieae>: *Lactuca ludoviciana*

This occurs mostly in the Great Plains, and in eastern states it is only a rare waif. *L. ludoviciana* is similar to *hirsuta* (Cr), but differs in its more prickly-toothed leaves, and its larger heads, with 20-56 flowers (versus 13-25). It was reported from Ky. by FNA 19, BA and Mohlenbrock et al. (1966). There is a verified coll. from CARL (O'Dell & Windler #990 at SIU), but a supposed coll. from CALL (MUR) has been redetermined as *canadensis*.

2230--*Cichorium intybus* L.

Asteraceae <Cichorieae>: *Cichorium intybus*

This showy alien ("chicory") is a cosmopolitan weed in temperate regions. Although variable in some characters, and selected for salad greens in the

vegetable, no segregates are generally recognized; $2n = 18$ only (in marked contrast to related weedy genera). It was first reported from Ky. in 1914, when Gm noted: "becoming a common weed locally in lawns and about the edges of towns... The seeds are scattered with forage seeds." It is now abundant in suitable habitat across the state.

ALI EU. **HAB** R-10 :: D 6. **ABU** +6.

2231--Krigia biflora (Walt.) Blake

Asteraceae <Cichorieae>: *Krigia biflora* (var. b.)

Typical *biflora* occurs in east-central states from Appalachian to Ozarkian regions. In Ky. it is typical of medium acid soils, but rare to absent on purely calcareous soils. Ranges and habitats overlap in much of southern Ky., where *biflora* tends to occur in more mesic, cooler habitats; hybrids are unknown ($2n = 10$).

HAB 11,7 ::? C 3. **ABU** g10 s9 -2.

2232--Krigia dandelion (L.) Nutt.

Asteraceae <Cichorieae>: *Krigia dandelion*

Although widespread and locally abundant across much of the southeastern states, this diploid ($2n = 5$) has a curiously interrupted range. In Ky. it is virtually absent from the Bluegrass and the Appalachian Plateaus. Typical habitat does not appear unusual: moderately hilly regions on average soils in slightly open woods. *K. dandelion* is the only native species in Cichoreae with potential for extensive clonal spread. It has rhizomes that produce globose tubers (FNA 19), which may be subject to consumption by some vertebrates.

HAB 7,11,10 ::? C 3. **ABU** g9 s8 -3.

2233--Krigia virginica (L.) Willd.

Asteraceae <Cichorieae>: *Krigia virginica*

This annual is typical of bare sandy soils across eastern states; $2n = 10, 20$.

HAB f-12,10 ::+ C 6. **ABU** g10 s8 -2.

2234--Krigia occidentalis Nutt.

Asteraceae <Cichorieae>: *Krigia occidentalis*

This distinctive southwestern species ($2n = 12$) is extremely rare east of the Mississippi Rv. (FNA 19, W). It was discovered by R. Seymour on Indian Hill, near Brownsville in EDMO. Although confirmed by JC, there has been lingering doubt about distinction from *virginica*, which also occurs at this site (A. Dattilo, pers. comm.).

HAB 12 +\ C 4. **ABU** g7 s2 -3?

2235--Krigia caespitosa (Raf.) Chambers

Asteraceae <Cichorieae>: *Krigia* <Serinia> *caespitosa* (*S. oppositifolia*)

This weedy annual is widespread in warmer regions of southeastern states, especially on medium-acid soils. Recognition of the genus *Serinia* for this species (and *wrightii*) has not been followed (FNA 19, W), though pappus is lacking and $2n = 8$ (versus multiples of 5 in most other *Krigia*).

HAB f-10 ::: C 6. **ABU** g9 s8 -2?

2236--Lapsana communis L.

Asteraceae <Cichorieae>: *Lapsana communis*

This European species is widespread in more northeastern states. Though segregates are recognized in Europe (with $2n = 12, 14$ and 16), these names have not been applied to North American plants. It is not clear if the few Ky. records were from established populations or just waifs.

ALI EU. **HAB** H-10? ::? D? 6. **ABU** +4.

2237--Taraxacum officinale G.H. Weber ex Wiggers (sensu lato)

Asteraceae <Cichorieae>: *Taraxacum officinale* (palustre var. vulgare)

This cosmopolitan weed ("dandelion") has been common since early after settlement. In the central Bluegrass, Short (1828-9) noted: "No portion of the Union is more completely overrun by this naturalized foreigner than this section, being so abundant as to give a yellowish hue to pastures in early spring." *T. officinale* contains a polyploid series ($2n = 16-48$), and many apomictic microspecies have been named in Europe. Such nomenclature has not been applied in North America, and the more precise names for our common plants remain somewhat uncertain (FNA 19, Y, W).

ALI EU. **HAB** S-10,7,12,9 ::: D 6. **ABU** +6.

2238--Taraxacum erythrospermum Andr. ex Bess T

Asteraceae <Cichorieae>: *Taraxacum erythrospermum* (laevigatum var. e.)

Although widely reported across North America, this species was not mapped in Ky. by FNA 19 and there has been uncertainty about its identification and nomenclature. *T. erythrospermum* is close to *officinale*, but differs in its leaves lacerate (versus usually just lobed or toothed, at least in lower leaves), with petioles slightly winged distally (versus broadly winged); also, seeds are brick red, reddish-brown or purple (versus olive, olive-brown, tan or gray). It has been reported from Ky. (M), and several colls. have been noted with reddish seeds (from BULL, CALL, FAYE, FLEM, FRAN & SHEL). But

most or all of these lack the distinctive "hooded appendage near the tip" of the inner involucre bracts (Cr); they may just be forms of officinale.

ALI EU.

2239--Hypochaeris radicata L.

Asteraceae <Cichorieae>: *Hypochaeris radicata*

This perennial (perhaps short-lived) is a diploid ($2n = 8$) that is widely scattered across humid temperate regions of North America.

ALI EU. **HAB** S-10 ::: D 6. **ABU** +5.

2240--Youngia japonica (L.) DC. W

Asteraceae <Cichorieae>: *Youngia [Crepis] japonica*

This pantropical diploid ($2n = 16$) is a weedy annual that is increasing in warmer regions of southeastern states (W), but remains virtually absent in the Ohio Valley. There is a coll. from CAMP (KNK), but the plant was a possible waif associated with birdseed.

ALI AS. **HAB** ::?

2241--Picris hieracioides L.

Asteraceae <Cichorieae>: *Picris hieracioides*

This annual diploid ($2n = 10$) is widely scattered over North America but rarely common. In Ky. it may just be a rare waif.

ALI EU. **HAB** S-10? ::? D? 6. **ABU** +4.

2242--Tragopogon pratensis L.

Asteraceae <Cichorieae>: *Tragopogon pratensis*

This biennial is widespread across North America, but generally less common than *dubius*, which has often been confused. *T. pratensis* was first reported from Ky. by Greenwell (1935). See Y for notes on variation and nomenclature, which remains uncertain. Hybrids among species of *Tragopogon* are well documented in western states, but are virtually unknown in the east; $2n = 12$ in all 3 species here (FNA 19).

ALI EU. **HAB** F-10,8 ::? E 5. **ABU** +5.

2243--Tragopogon dubius Scop.

Asteraceae <Cichorieae>: *Tragopogon dubius* (major)

This attractive biennial weed has become widespread in North America, especially in western region. It was first recorded from Ky. during the 1950s (Davies 1955, Beckett 1956).

ALI EU. **HAB** F-10,12 :: D 6. **ABU** +6.

2244--Tragopogon porrifolius L.

Asteraceae <Cichorieae>: *Tragopogon porrifolius*

Although widely reported as established in North America, this cultivated biennial root-vegetable ("salsify") may not be truly naturalized in Ky. There have been a few reports (M), but only one record may be verifiable: the coll. from FLEM by B (probably at US).

ALI EU. **HAB** F-10,9 :: C? 6. **ABU** +4.

2245--Crepis pulchra L.

Asteraceae <Cichorieae>: *Crepis pulchra*

This annual is widespread in northeastern states and adjacent Canada, growing in various disturbed habitats on fertile soils.

ALI EU. **HAB** F-10 ::? D 6. **ABU** +5.

2246--Crepis capillaris (L.) Wallr.

Asteraceae <Cichorieae>: *Crepis capillaris*

This annual or biennial is scattered in cool temperate humid regions of northern states and adjacent Canada, typically occurring in mowed areas on fertile soils. It is easily overlooked in comparison with *pulchra* (FNA 19, Y). *C. capillaris* has smaller heads, and stems are non-glandular (versus viscid); $2n = 6$ (versus 8). A closely related species of colder zones, *C. tectorum* L., has also been reported from JEFF (herbarium of Ind. Univ. SE), but it is probably not established in Ky. or other southeastern states (K, W).

ALI EU. **HAB** F-10 ::? D? 6. **ABU** +4.

2247--Pyrrhopappus carolinianus (Walt.) DC.

Asteraceae <Cichorieae>: *Pyrrhopappus carolinianus*

This annual or biennial is widely scattered across southeastern states, usually growing in fields and roadsides on medium-acid soils. In addition to diagnostic differences in its fruits and involucre bracts (FNA 19, Y), *Pyrrhopappus* has relatively large heads with involucres ca. 10-25 mm high (versus 5-12 mm in *Crepis* and *Hieracium* recorded from Ky.); $2n = 12$ (as in no other native Cichorieae).

HAB F-10 ::? C 5. **ABU** g9 s9 -2?

2248--Nabalus altissimus (L.) Hook.

Asteraceae <Cichorieae>: *Nabalus [Prenanthes*] altissimus* (var. a.)

This is widespread in forests of eastern North America except on the southeastern Coastal Plain. It often forms dense colonies with short offsets

from its tuberous rootstocks (Y); in deeper shade, most offsets do not flower and leaves often disappear in dry warm seasons. In Ky. a coll. from CARL (MUR) has been referred to the southwestern *P. altissima* var. *cinnamomea* Fern., but that taxon is not generally recognized. A few colls. have been misidentified as the high Appalachian species, *N. roanensis* Chickering (= *P. cylindrica* (Sm.) E.L. Braun), which remains unknown in the state (M). See W for diagnostic characters of *roanensis*, which reportedly intergrades with *altissima*; $2n = 16$ in both (Cr, FNA 19).

HAB 5,7,11 D 2. **ABU** g9 s9 -3.

2249--*Nabalus barbatus* (Torr. & Gray) A. Heller

Asteraceae <Cichorieae>: *Nabalus* [*Prenanthes**] *barbatus*

This globally rare species is largely restricted to remnants of native grassland in the southern Interior Low Plateaus and the west Gulf Coastal Plain (FNA 19). In Ky., it is known only from TRIG, in or near Fort Campbell and Land-between-the-Lakes.

HAB 10,12 D 5. **ABU** g5 s2 -5.

2250--*Nabalus serpentarius* (Pursh) Hook.

Asteraceae <Cichorieae>: *Nabalus* [*Prenanthes**] *serpentarius*

In Ky. this largely Appalachian species extends a little into the Knobs region. There is also an verified 1835 coll. of C.W. Short (GH) from "barrens of Ky.", which suggests a more disjunct occurrence; see notes under *albus*.

HAB 11,7,10 B 3. **ABU** g8 s8 -2.

2251--*Nabalus trifoliolatus* Cass. R

Asteraceae <Cichorieae>: *Nabalus* [*Prenanthes**] *trifoliolatus*

There have been several reports from Ky. of this northeastern and high Appalachian species, but there have been misidentifications among this and related species (see notes under *albus*). Also, there may have been some hybridization with *serpentarius* and other species in different parts of its range (FNA 19). No convincing colls. from Ky. have been seen. There is an immature coll. from HARL (MDKY) that may be this species. There is a verified coll. labelled as from ROWA (MDKY), but it is not accepted due to probable error in the data (Campbell et al. 1992). However, the species is known from nearby Scioto Co., Ohio, in hills similar to parts of ne. Ky. (PL; D. Boone, pers. comm.).

2252--*Nabalus albus* (L.) Hook.

Asteraceae <Cichorieae>: *Nabalus* [*Prenanthes**] *albus*

There has been some confusion in Ky. between this widespread northeastern species and *serpentarius* or other species, but records of *albus* mapped here are mostly confirmed. There is also a verified 1840 coll. of C.W. Short (GH) from "Barrens of Ky." *N. albus* is similar to *trifoliolatus* and *serpentarius*, but usually has a distinctively deep reddish-brown ("cinnamon") pappus (versus stramineous or pale brown); $2n = 32$ (versus 16). *N. trifoliolatus* is distinct in its primary involucre bracts which are as long as the pappus (versus shorter), and its outer ones ("calyculi" of FNA 19) which are deltoid to ovate (versus deltoid to lanceolate or setaceous). The more southern *serpentarius* differs from both of these northern species in its pubescent involucre bracts (versus glabrous). These species may all be short-lived monocarpic perennials, but further studies of life-history are needed.

HAB 7,10,11 D 4. **ABU** g9 s2 -5.

2253--*Nabalus racemosus* (Michx.) Hook.

Asteraceae <Cichorieae>: *Nabalus* [*Prenanthes**] *racemosus*

This occurs in north-central states and adjacent Canada, growing in fens and other damp calcareous open sites. In Ky. it is known only from an old coll. made from PEND (KY) near Falmouth, and a recent coll. from LEWI (EKY) in the Crooked Creek Barrens.

HAB 9,1 E 5. **ABU** g9 s1 -6?

2254--*Nabalus asper* (Michx.) Torr. & Gray

Asteraceae <Cichorieae>: *Nabalus* [*Prenanthes**] *asper*

This midwestern species is unknown across southeastern states beyond w. Ky., c. Tenn. and n. Miss. In these states, it is a rare remnant of native grasslands on relatively deep, fertile, submesic soils. Yet (under the name *P. illinoensis*, Short (1840) noted: "abundant in the barrens of Kentucky, as well as the prairies of Illinois."

HAB 10 D? 5. **ABU** g8 s4 -5.

2255--*Nabalus crepidineus* (Michx.) DC.

Asteraceae <Cichorieae>: *Nabalus* [*Prenanthes**] *crepidineus*

This largely midwestern species appears to have declined much since settlement in Ky., but it is easily overlooked and has been rediscovered in several regions. Plants from GRAV (EKY) and adjacent Tenn. (Stewart Co.) have whitish flowers, but those from elsewhere in Ky. have yellowish flowers. *P. crepidinea* usually grows in rather weedy, thin woods and edges on damp fertile soils near streams, but persistent disturbance from livestock or mowing can eliminate it. Like *altissimus*, *crepidineus* can form colonies with short

offsets from its rootstocks. But when individual ramets flower they generally die, leading to an appearance of monocarpy (Isaac 2009). Unless exposed to full sun for some of the day, no flowering occurs at all and leaves disappear completely during Jun-Jul.

Rafinesque (1836, 4:85) made several colls. of this species from Ky. and elsewhere (PH; see M). He erected the genus *Opicrina* for these plants, with at least two species, and became quite interested in their properties. He recommended cultivation for medicinal use: "exuding a milk intensely bitter, producing a bitter opium which the name implies... in Central Kentucky rich woods" (for *O. latifolia*).

HAB 8,4,10,7 E 4. **ABU** g7 s4 -5.

2256--*Centaurea repens* L. R

Asteraceae <Cardueae>: *Centaurea* <Acroptilon> *repens*

This is a colonial perennial with running roots. The few records from Ky. need to be confirmed. Maddox et al. (1985) reported it from HARD, and there are tentatively identified colls. from LEWI (KY) and OLDH (DHL).

ALI EU.

2257--*Centaurea biebersteinii* DC.

Asteraceae <Cardueae>: *Centaurea biebersteinii* ("maculosa"*; *stoebe* ssp. *micranthos*)

This short-lived perennial is a tetraploid ($2n=36$). It was first reported from Ky. in 1943 (B), and it is now locally abundant on dry base-rich soils across the state. Following Ochsmann (2001), an alternative name has been recently adopted in some treatments (FNA 19; Y, W): *C. stoebe* L. ssp. *micranthos* (S.G. Gmelin ex Gugler) Hayek. Typical *stoebe* (= *C. maculosa* auct.) is a diploid annual. The two taxa have become largely sympatric in Europe, but *biebersteinii* appears to have had a more western range before forest clearance.

ALI EU. **HAB** R-10,12 :: D 5. **ABU** +6*.

2258--*Centaurea cyanus* L.

Asteraceae <Cardueae>: *Centaurea cyanus*

This first records of this showy annual in Ky. were made during the 1980s. It has increased in recent decades, partly due to plantings for displays along roads and then subsequent escapes.

ALI EU. **HAB** H-10 ::: C 6. **ABU** +5.

2259--*Centaurea transalpina* Schleich. ex DC.

Asteraceae <Cardueae>: *Centaurea transalpina* (dubia, *nigrescens*)

In Ky. this perennial is known only from colls. of the late J.W. Thieret (KNK). It is similarly distributed in North America to *jacea*, but much less common.

ALI EU. **HAB** F-10 ::? D 6? **ABU** +4.

2260--*Centaurea nigra* L.

Asteraceae <Cardueae>: *Centaurea nigra* (*jacea* ssp. n.)

The history of this perennial weed in North America and Ky. is similar to that of *C. jacea*. The few colls. from Ky. may be var. *radiata* DC., which may have originated from hybrids with *jacea* (= *X pratensis* auct.). The status of *radiata* needs further investigation (FNA 19, Y).

ALI EU. **HAB** F-10 ::? D 6? **ABU** +4.

2261--*Centaurea jacea* L.

Asteraceae <Cardueae>: *Centaurea jacea* (ssp. j.)

This perennial occurs in northeastern and northwestern regions, but it is virtually absent in southeastern states (FNA 19; PL). The first report from Ky. was in 1914, when Gm noted "not very common"; it has remained rare.

ALI EU. **HAB** F-10 ::? D 6? **ABU** +4.

2262--*Centaurea solstitialis* L.

Asteraceae <Cardueae>: *Centaurea solstitialis*

This annual or biennial is widespread across North America, except in southeastern states (FNA 19; PL). Although first reported from Ky. in 1914 (Gm), there have been few subsequent records.

ALI EU. **HAB** F-10 ::? D 6? **ABU** +4.

2263--*Centaurea diffusa* Lam.

Asteraceae <Cardueae>: *Centaurea diffusa*

This annual or biennial has become common in much of western North America, but it is generally rare to the east and absent in southeastern states (PL).

ALI EU. **HAB** F-10 ::? D 6? **ABU** +4.

2264--*Centaurea benedictus* (L.) L. R

Asteraceae <Cardueae>: *Centaurea* <*Cnicus*> *benedictus*

This annual was reported by J, but details are not available; the earlier report by BA was based on an immature coll., probably misidentified (M).

ALI EU.

2265--Cirsium altissimum (L.) Hill

Asteraceae <Cardueae>: *Cirsium altissimum*

This widespread eastern biennial (or short-lived perennial) is curiously local in Ky. It occurs mostly on moderately fertile, base-rich soils, in subxeric woods with a history of disturbance from browsing and burning.

Hybridization with *discolor* appears to occur locally in midwestern regions (FNA 19, Y); it has not been clearly documented in Ky. but some plants are suggestive. *C. altissimum* usually has lower chromosome number ($2n = 18$ versus 20), leading to sterility in hybrids.

HAB 8,7,10,11 D 4. **ABU** g10 s7 -3.

2266--Cirsium discolor (Muhl. ex Willd.) Spreng.

Asteraceae <Cardueae>: *Cirsium discolor*

This widespread eastern biennial is the most common native thistle in Ky., but it is not a significant problem for farmers. It mostly occurs in old fields and roadsides. Hybrids are not documented in Ky., but may be expected with *altissimum* and *muticum*; $2n = 20$.

HAB f-10,8,7 D 5. **ABU** g10 s10 +1?

2267--Cirsium carolinianum (Walt.) Fern. & Schub.

Asteraceae <Cardueae>: *Cirsium carolinianum*

In some treatments before 1950 (e.g. B), this widespread southeastern diploid ($2n = 20$) was misnamed *C. virginianum* (L.) Michx., a closely related species that occurs just on the southeastern Coastal Plain ($2n = 28$). In Ky.

carolinianum appears to be a somewhat conservative biennial in remnants of thin woodland and grassland, especially on sandy soils in Appalachian regions with a long history of disturbance.

HAB 10,12 B 4. **ABU** g9 s7 -3.

2268--Cirsium muticum Michx.

Asteraceae <Cardueae>: *Cirsium muticum*

Although ranging widely across eastern North America, this biennial occurs mostly in somewhat base-rich wetlands of northern regions. Variation deserves further attention; $2n = 20-23$ and 30 (FNA 19, Y). In Ky. and some other Appalachian states (Tenn., N.C., Va., W.Va. and perhaps further northeast based on colls. at GH), *muticum* usually occurs on relatively mesic sites with medium acid soils, especially along roads and trails on lower slopes

in the Rugged Hills of the Appalachian Plateaus. In these hills, it is often more robust, with relatively large heads and less deeply pinnatifid leaves.

These plants with less deeply pinnatifid leaves have been treated as var. *subpinnatifidum* (Britt.) Fern. (or a forma in F). However, variation may be too continuous across the whole range of *muticum* for segregates to be readily recognized. (A somewhat parallel ecological distinction may exist within *Eutrochium maculatum*.)

HAB f-8,10,6,9 C 4. **ABU** g8? s7 -2.

2269--Cirsium arvense (L.) Scop.

Asteraceae <Cardueae>: *Cirsium arvense*

This is a noxious weed across cool temperate regions of North America. It was first reported from Ky. in 1914, when Gm noted: "The Canadian thistle is more often seen in newspapers than in our fields... it occurs locally in the State... but for some reason disappears again... its seeds frequently come to Kentucky in imported forage seeds..." It was rarely recorded until after 1950 (Harvill 1941), but increased greatly after 1970. Since 1990 *arvense* has become much more widespread than colls. indicate, but Ky. is near the southern edge of its range in North America. It has expanded towards the south, especially along major highways, but much less in Tenn. (Sudbrink et al. 2001). It remains virtually absent on the southern Interior Low Plateaus and Coastal Plain.

C. arvense is an unusual thistle, spreading aggressively by perennial running roots and largely dioecious, with a small proportion of perfect flowers; $2n = 34$ (versus 20 in most native *Cirsium*). Most or all plants may be var. *horridum* Wimmer & Grab. (see also W), but varieties are not generally recognized in North America.

ALI EU. **HAB** F-10 :: D 5. **ABU** +6*.

2270--Cirsium vulgare (Savi) Ten.

Asteraceae <Cardueae>: *Cirsium vulgare* (lanceolatum)

This prickly polyploid weed ($2n = 68$) is widespread in temperate regions of North America. In Ky. it became the most common thistle in farmland early after settlement (Short et al. 1833; Gm), but other species have now surpassed it in some areas.

ALI EU. **HAB** G-10 :: D 6. **ABU** +6.

2271--Carduus nutans L.

Asteraceae <Cardueae>: *Carduus nutans*
Although present in North America before 1900 (Y and his citations), this robust alien weed (known as "musk" or "nodding" thistle) was not properly documented in Ky. until about 1970 Meijer (1972a). As in temperate regions across the continent, *nutans* has increased during recent decades to become one of the most abundant thistles. Its southern limit lies well to the south, on the Coastal Plain (K, SE).

ALI EU. **HAB** H-10,9 ::: D 6. **ABU** +6.

2272--*Carduus acanthoides* L.

Asteraceae <Cardueae>: *Carduus acanthoides*
This weed from southern Europe was first reported in Ky. by Meijer (1972a). It has become locally abundant in the eastern and central Bluegrass region, but remains unknown elsewhere. Although widespread across much of North America, the species is rare or absent in southeastern states (FNA 19; PL). Partly fertile hybrids with *nutans* can be expected (Cr, FNA 19), despite the higher chromosome number of *acanthoides*: $2n = 22$ versus 16.

ALI EU. **HAB** G-10 :: E 5. **ABU** +5.

2273--*Onopordum acanthium* L.

Asteraceae <Cardueae>: *Onopordum acanthium*
This biennial weed ("Scotch thistle") was initially used for food and medicine on the frontier. It became a widespread problem across northern states and adjacent Canada, but does not extend south of the central Ohio Valley and central Appalachian regions (FNA 19, Y, W). In Ky. it was first reported in 1914, when Gm noted: "at the edges of cities this striking thistle has become established in dense patches on waste ground and along railroads." However, it has remained generally uncommon and largely restricted to northern counties.

ALI EU. **HAB** G-10 E 6? **ABU** +4<.

2274--*Arctium minus* Bernh.

Asteraceae <Cardueae>: *Arctium minus* (*lappa* var. *minus*)
This common biennial weed has probably been present in Ky. since early after settlement (Short et al. 1833). Reports of typical *A. lappa* L. and *A. tomentosum* P. Mill. cannot be confirmed and may be erroneous (M), but those species are known nearby in states to the north of Ky. Typical *lappa* is locally common in Hamilton Co., Ohio, and often mixed with *minus* (D. Boone, pers. comm.); hybrids may be expected ($2n = 32$ and 36 in both; Cr,

FNA 19). All of these taxa were treated as varieties of *lappa* in early literature (e.g. Gray 1864).

ALI EU. **HAB** G-10,8 ::: D 6. **ABU** +6.

2275--*Acorus calamus* L.

Acoraceae [Araceae]: *Acorus calamus*
Based on recent treatments (reviewed in FNA 22 and W), almost all plants of this genus in southeastern states are sterile triploid hybrids to be included in *A. calamus*, which is said to have been introduced from Europe for medicine and confection.

The native *A. americanus* Raf. (= *A. calamus* var. *americanus* H.D. Wulff) includes only fertile diploids, and has mostly narrower leaves that lack a prominent mid-vein. Var. *americanus* occurs across northeastern states and adjacent Canada, but remains unknown in Mo., Ky. and most southern Appalachian regions.

ALI m. **HAB** f-2,9 ~ C 5. **ABU** g10? s9? +1?

2276--*Orontium aquaticum* L.

Araceae: *Orontium aquaticum*
This monotypic aquatic genus is largely restricted to the southeastern Coastal Plain east of the Mississippi Rv., plus scattered sites in the Piedmont and southern Appalachians. In Ky. it is known only from the southern Appalachian Plateaus and Cumberland Mts., growing in ponded areas along rivers, streams and streamheads, mostly on acid sandy or boggy soils.

HAB 1,2 ~ B 4. **ABU** g10 s4 -1.

2277--*Symplocarpus foetidus* (L.) Salisb. ex Nutt. R

Araceae: *Symplocarpus foetidus*
This is common in northeastern swamps and disjunct in east Asia. It was reported from Ky. in an environmental assessment for a site BOON (Anonymous 1977). The record was accepted by BT, but plants could not be located in further field work. There is also an old report from the Louisville area in JEFF (McMurtrie 1819).

HAB 6,9 C 3. **ABU** g9 s1? -4?

2278--*Peltandra virginica* (L.) Schott

Araceae: *Peltandra virginica*

This emergent aquatic occurs widely in wetlands across eastern states except in the upper midwest, but it is most common on the coastal plains (FNA 22, W). The species contains two polyploids ($2n = 88, 112$), but segregates are not recognized. In Ky. it is largely restricted to lowlands on the Mississippi Embayment and along the lower Ohio Rv.
HAB 2 ~ C 5. **ABU** g9 s8 -3?

2279--*Arisaema dracontium* (L.) Schott

Araceae: *Arisaema dracontium*

This is widespread in eastern North America, usually growing in low woods but also occasional on uplands. Segregates are not defined, though $2n = 28$ and 56 (FNA 22).

HAB 4,5,7 D 3. **ABU** g9 s9 -4.

2280--*Arisaema quinatum* (Buckl.) Schott

Araceae: *Arisaema quinatum* (triphillum ssp. q.*)

This poorly understood diploid taxon occurs locally in southeastern states, from the mountains of Tenn. and N.C. to disjunct sites from Tex. to Fla. (FNA 22, W). In Ky. it is known only from the Cumberland Mts. or nearby.

HAB 5 C 2. **ABU** g7? s4 -1.

2281--*Arisaema stewardsonii* Britt. R

Araceae: *Arisaema stewardsonii* (triphillum ssp. s.*)

This northeastern taxon has been reported from BELL by Treiber (1980) and others, but no coll. has been located.

2282--*Arisaema pusillum* (Peck) Nash

Araceae: *Arisaema pusillum* ("triphillum"; triphyllum ssp. p.*)

This has a largely southeastern range, and is particularly distinct on the Piedmont and Atlantic Coastal Plain (FNA 22, W). Distinction from typical triphyllum needs further research; identification in the herbarium is difficult. Treatment as subspecies may be preferred, but intergradation is unknown. In Ky. some populations of these rather small late flowering plants appear to be associated with relatively damp and acid soils, especially in flatwoods and streamheads of the Mississippian and Appalachian Plateaus.

HAB 6,9,7 C 2. **ABU** g9 s8 -3.

2283--*Arisaema triphyllum* (L.) Schott

Araceae: *Arisaema triphyllum* (atrorubens; triphyllum ssp. t.*)

This widespread eastern taxon is largely tetraploid ($2n = 56$), in contrast to the other segregates of triphyllum ($2n = 28$). Forms with purple (typical), striped (forma zebrina) and green (forma viride) flowers are all scattered widely through Ky. Colls. need to be studied more closely to distinguish pusillum; see also stewardsonii and quinatum.

HAB 5,7,11 D 1. **ABU** g10 s10 -3.

2284--*Pistia stratiotes* L. C

Araceae: *Pistia stratiotes*

This pantropical floating aquatic is widely used in aquaria. It sometimes escapes into warmer waters across North America, persists only in more southern states (PL, W). There is a coll. from JEFF in Ky. (herbarium of Ind. Univ. SE).

ALI SA+.

2285--*Spirodela polyrrhiza* (L.) Schleid.

Lemnaceae [Araceae]: *Spirodela polyrrhiza*

This is the largest species of Lemnaceae, with a cosmopolitan range in eutrophic waters of temperate and tropical regions (FNA 22, Y). There are several cytotypes; $2n = 30$ to 80.

HAB 2 ~ D 6. **ABU** g10 s9 -1?

2286--*Landoltia punctata* (G.F.W. Mey.) D.H. Les & D.J. Crawford

Lemnaceae [Araceae]: *Landoltia* [*Spirodela*] *punctata*

This has reportedly spread from South America to eutrophic waters of southern states in recent centuries, partly due to use in aquaria (FNA 22, W). The species is easily confused with the larger species, *Spirodela polyrrhiza*, but there is justification for its placement in *Landoltia* as a monotypic genus; $2n = 40, 46, 50$.

ALI SA. **HAB** 2 ~ C? 6. **ABU** +4.

2287--*Lemna trisulca* L. R

Lemnaceae [Araceae]: *Lemna* <Hydrophylla> *trisulca*

This distinctive, submerged mat-forming species is widespread globally and has varied cytology; $2n = 20-80$. It is expected in Ky., but there are no verified records. It was reported by Short et al. (1833), and M provided an unverified sight record from a woodland pond in LOGA.

2288--*Lemna valdiviana* Phil.

Lemnaceae [Araceae]: *Lemna* <Uninerves> *valdiviana*

This is widespread from North to South America, and is easily overlooked or confused with *perpusilla*; $2n = 40, 42$. The closely related species, *L. minuta* Kunth ($2n = 36, 42$), is also widespread in the Americas and expected in Ky. **HAB** 2 ~ C? 6. **ABU** g10 s5? -2?

2289--*Lemna aequinoctialis* Welw.

Lemnaceae [Araceae]: *Lemna* <Alatae> *aequinoctialis*

This is a variable cosmopolitan species of warmer regions; $2n = 20-84$. It is rarely recorded in Ky. but easily overlooked or confused with *perpusilla*.

ALI s. **HAB** 2 ~ C? 6. **ABU** g10 s4? -2?

2290--*Lemna perpusilla* Torr.

Lemnaceae [Araceae]: *Lemna* <Alatae> *perpusilla*

This occurs mostly in northeastern states and adjacent Canada. It is a close relative of *aequinoctialis* but much less variable and less widely distributed; $2n = 40, 42$. Distinction needs to be checked in some colls.

HAB 2 ~ C? 6. **ABU** g9 s8? -2?

2291--*Lemna minor* L.

Lemnaceae [Araceae]: *Lemna* *minor*

This cosmopolitan species is the most common duckweed in Ky. It is a variable taxon ($2n = 20-126$) that is combined by some authors with *obscura* ($2n = 40, 42, 50$) and *turionifera* ($2n = 40, 42, 50, 80$).

HAB 2 ~ D 6. **ABU** g10 s10? -1?

2292--*Lemna obscura* (Austin) Daubs

Lemnaceae [Araceae]: *Lemna* *obscura*

This close relative of *minor* occurs mostly from southeastern states to Central America. In Ky. it is known mostly from eutrophic ponds in the Bluegrass region.

HAB 2 ~ E? 6. **ABU** g10 s8? -2?

2293--*Lemna turionifera* Landolt

Lemnaceae [Araceae]: *Lemna* *turionifera*

This close relative of *minor* occurs widely in cooler temperate regions of the world. It is rarely recorded in southeastern states, and there is only one record from Ky.

HAB 2 ~ E? 6. **ABU** g10? s2? -2?

2294--*Wolffiella gladiata* (Hegelm.) Hegelm.

Lemnaceae [Araceae]: *Wolffiella gladiata* (floridana)

This occurs mostly in stagnant mesotrophic waters of southeastern states, where it is most common on the Coastal Plain (W). Few cytotypes are known; $2n = 40, 42$.

HAB 2 ~ C? 6. **ABU** g8? s4? -2?

2295--*Wolffia brasiliensis* Weddell

Lemnaceae [Araceae]: *Wolffia brasiliensis* (papulifera, punctata)

This is widespread in stagnant mesotrophic to eutrophic waters from eastern and western states to South America (FNA 22), with several cytotypes ($2n = 20$ to 80). Colls. should be rechecked carefully; many have more than one species and there has been confusion in nomenclature.

HAB 2 ~ D? 6. **ABU** g8? s8? -1?

2296--*Wolffia borealis* (Engelm. ex Hegelm.) Landolt ex Landolt & Wildi

Lemnaceae [Araceae]: *Wolffia borealis* ("punctata"; *brasiliensis* var. *bo.*)

This is widespread across the United States and southern Canada. Despite general under-collection of Lemnaceae, *borealis* is clearly less frequent than *brasiliensis* in Ky. and other east-central states (FNA 22, PL, W). *W. borealis* is closely related to *brasiliensis* and occurs in similar habitats.

HAB 2 ~ D? 6. **ABU** g9? s8? -1?

2297--*Wolffia columbiana* Karst.

Lemnaceae [Araceae]: *Wolffia columbiana*

This is widespread in stagnant mesotrophic to eutrophic waters from eastern North America to South America (FNA 22). Variation deserves further study ($2n = 30-70$), as well as search for the closely related *globosa*.

HAB 2 ~ E? 6. **ABU** g10 s8? -1?

2298--*Wolffia globosa* (Roxb.) Hartog & Plas R

Lemnaceae [Araceae]: *Wolffia globosa* (*Lemna* g.)

This close Asian relative of *columbiana* was reported from Ky. by J, but details are not available. It has also been reported from Tenn. (Landolt 2000). **ALI** AS.

2299--*Alisma subcordatum* Raf.

Alismataceae: *Alisma subcordatum* (*plantago-aquatica* var. *parviflora*)

This rhizomatous subaquatic plant is widespread in shallow water of eastern and central North America.

HAB 2 ~ D 6. **ABU** g10 s10 -1?

2300--*Alisma triviale* Pursh R

Alismataceae: *Alisma triviale* (plantago-aquatica var. americana)
This widespread northern and western species remains unknown south of the Ohio Rv. and east of the lower Mississippi Rv. (PL). It was reported from Ky. by Pr as *A. plantago-aquatica* L. var. *americana* J.A. Schultes, and by Gunn (1968) as *A. triviale*. However, no coll. has been located.

Diagnostic characters differ between treatments (F, Cr, FNA 22, Y). Compared to *subcordatum*, *triviale* usually has larger petals (ca. 3.5-6 x 3-4 mm versus 1.5-3 x 1.5-2 mm), larger fruting heads (ca. 4-7 mm wide versus 2-4 mm), and larger achenes (ca. 1.5-2.2 mm long versus 2.1-3 mm); 2n = 28 versus 14.

2301--*Sagittaria calycina* Engelm.

Alismataceae: *Sagittaria* <*Lophotocarpus*> *calycina* (*montevidensis* ssp. c.)
This annual is widespread in central states, with disjunctions or extensions to east, west and south. In Ky. it is most common along drying muddy shores of old sloughs and ponds on broader river bottoms. Colls. from CALD (R. Athey; check EKY), CAMP (KNK) and elsewhere have been named *forma depauperatus* (Engelm.) Fern. (in *Lophotocarpus*). However, such plants are often mixed with typical plants and do not appear worth distinguishing (see also B).

HAB 2 D 5. **ABU** g10 s9 -2?

2302--*Sagittaria australis* (J.G. Sm.) Small

Alismataceae: *Sagittaria australis* ("longirostra"; *engelmanniana* ssp. l.)
This occurs mostly in southeastern states east of the Mississippi Rv., centered on Appalachian regions and the Interior Low Plateaus. Some colls. from Ky. are difficult to distinguish from the more midwestern *brevirostra*, and should be rechecked.

Typical *S. engelmanniana* (which is largely on the southeastern Coastal Plain) and the related *S. cuneata* Sheldon (which is largely in more northern regions) have also been reported from the state, but probably based on misidentifications (M). Despite uniform chromosome number in the genus (2n = 22), there is little evidence of hybridization among these species or others (FNA 22).

HAB 2 ~ D 5. **ABU** g9 s9 -3?

2303--*Sagittaria brevisrostra* Mackenzie & Bush

Alismataceae: *Sagittaria brevisrostra* (*engelmanniana* ssp. b.)
This midwestern species is closely related to *australis*, but intermediate plants have not been documented (FNA 22). Ranges overlap broadly in Ky., and there has been some confusion.

HAB 2 ~ C 5. **ABU** g8 s8 -2?

2304--*Sagittaria latifolia* Willd.

Alismataceae: *Sagittaria latifolia*
This tuberous species ("duck potato") is widespread across North, Central and South America. In Ky. it may be less frequent than the *australis-brevirostra* group, and concentrated in older ponds with more mature vegetation, but there has been frequent confusion among these species in the field.

Although highly variable in its leaves, segregates have not been generally recognized in recent treatments. Records of var. *obtusa* (Engelm.) Wieg. are included here. Plants with hairy leaves are known as var. *pubescens* (Muhl. ex Nutt.) J.G. Sm., and are recognized by some authors as a distinct taxon of southeastern states (W), but no other diagnostic characters are known. There is coll. referable to var. *pubescens* from CALL (MUR).

HAB 2 ~ D 5. **ABU** g10 s8 -2?

2305--*Sagittaria platyphylla* (Engelm.) J.G. Sm.

Alismataceae: *Sagittaria platyphylla* (*graminea* var. p.)
This rhizomatous species is centered in the lower Mississippi Valley (K) and reaches its northern limits in or near s. Mo (F), nw. Tenn. (Ch) and w. Ky. The only confirmed Ky. records are colls. of R. Athey and KSNPC from Fish Pond and Reelfoot Lake in FULT (KY, EKY). There has been confusion with *graminea* and *rigida*; records from MCRA (KY-Agr.) and especially JEFF (BT) should be rechecked.

HAB 2 ~ C? 6? **ABU** g7 s4 -3?

2306--*Sagittaria graminea* Michx.

Alismataceae: *Sagittaria graminea* (var. g.)
This is widely scattered over eastern and central North America, but concentrated in coastal wetlands and along the midwestern "flyway" for waterfowl (K). It usually grows along shorelines with much variation in water level. Some colls. are difficult to distinguish from *platyphylla* or *rigida*, and should be rechecked.

HAB 2 ~ C 6? **ABU** g10 s5 -3?

2307--Sagittaria rigida Pursh

Alismataceae: *Sagittaria rigida*

This is widespread in midwestern and northeastern states, but rare from Ky. and Tenn. to Del. and Va. (K) The only verified Ky. records are from a pond in EDMO, where it has been collected during 1980-2000 by M. Medley (WKY) and R. Seymour (pers. comm.). Other reports are probably based on colls., but details are unknown (F, BT). A related southern species, *S. falcata* Pursh (*S. lancifolia* var. *media*) was reported from Ky. by Fassett (1940) but is unlikely here, since it is concentrated in coastal regions (Cr, K, M).

HAB 2 ~ C? 6? **ABU** g8 s2 -3?

2308--Echinodorus cordifolius (L.) Griseb.

Alismataceae: *Echinodorus cordifolius*

This perennial (with tuberculate roots) occurs from southeastern states to South America. In Ky. it is largely restricted to wetlands of the Mississippian Embayment and among the Shawnee Hills.

HAB 2 ~ C? 6. **ABU** g8 s7 -3.

2309--Echinodorus berteroi (Spreng.) Fassett

Alismataceae: *Echinodorus berteroi* (rostratus)

This annual occurs mostly from south-central states to Central America. In Ky. it occurs in similar habitat to *cordifolius*, but is much less common. Hybridization may be possible, base on an observation in Mo. (Y).

HAB 2 ~ D 6. **ABU** g10 s4 -4?

2310--Echinodorus parvulus Engelm.

Alismataceae: *Echinodorus parvulus* (tenellus var. p.*)

Broadly defined, *tenellus* has a widespread tropical and temperate American range. The more northern plants have been segregated as *E. parvulus*, but *E. tenellus* (Martius) Buchenau var. *parvulus* (Engelm.) Fassett may be a more reasonable name (Y). In North America there are few known localities for *parvulus* (FNA 22, W), and it seems imperiled in most states. It typically occurs along seasonal drawdown zones in various types of marginal or periodic wetlands. In Ky. it is known only from an ephemeral sinkhole pond of CHRI, in association with *Schoenoplectus hallii* (Chester & Souza 1984).

HAB f-9,2 D 6. **ABU** g5 s2 -4?

2311--Vallisneria americana Michx.

Hydrocharitaceae: *Vallisneria americana*

Widespread submerged aquatic across North and Central America, usually in rivers and streams with little pollution or other disturbance. In Ky. most records are from Appalachian regions, but the species still survives locally within the Ohio Rv. upstream of Cincinnati. The FAYE record mapped here is the most likely locality for an 1830s coll. of C.W. Short (CINC) labelled just "Ky. River." Currently, the only plants known to survive in the Kentucky Rv. watershed are in Collins Fork (CLAY and KNOX).

HAB 1 ~ D 5. **ABU** g10 s5 -3.

2312--Limnobium spongia (Bosc) L.C. Rich. ex Steud.

Hydrocharitaceae: *Limnobium spongia*

Floating aquatic of southeastern states, also disjunct on south side of Great Lakes, and in tropical America. In Ky. it is rarely collected, with records only from the Mississippian Embayment and wetlands within the Shawnee Hills.

HAB 2 ~ C 6. **ABU** g10 s4 -2?

2313--Hydrilla verticillata (L.) Royle

Hydrocharitaceae: *Hydrilla verticillata*

This South Asian species has become a problematic invader of impoundments and sluggish riverine pools at scattered sites across southeastern and mid-Atlantic states, especially in Fla. (FNA 22). In Ky. there have been recent colls. from JEFF (at JEF from Indiana shore) and TRIG (at AP from Kentucky Lake, formerly Cumberland Rv.). It has also been reported recently to SE by R. Echols (Ky. Dept. Fish & Wildlife; pers. comm.) from FLOY (Dewey Lake), JOHN (Paintsville Lake) and KNOT (Carr Fork Lake), but colls. are not yet available

Further south, *Hydrilla* has become abundant since 1990 within pools of the free-flowing Obed Rv., in Morgan Co., Tenn. (D. Estes, pers. comm.). It has also been found in much of the central Ohio Rv. and lower Kanawha Rv. in Ohio and W.Va. (SE). As reviewed by Les et al. (1997), two distinct "biotypes" of this clonally spreading species are known in North America: a female strain, and a monoecious strain.

ALI AS. **HAB** 2 ~ C 6. **ABU** +4*.

2314--Elodea canadensis Michx.

Hydrocharitaceae: *Elodea canadensis*

This is widespread across much of North America, especially in slow calcareous waters, but it has become rare to locally extinct in several east-central states with intense agricultural impacts on water quality. There is an

old coll. from FAYE (MICH), made by R. Peter in 1834, from "lagoon, banks of Kentucky River below Raven Creek." During 2010, JC rediscovered it in FAYE at Lindsay Spring, on the edge of Lexington, growing mostly in cool water at a depth of 1-2 m.

HAB 2,1 ~ D 6. **ABU** g9 s5? -3?

2315--Elodea nuttallii (Planch.) St. John

Hydrocharitaceae: *Elodea nuttallii*

This is widely scattered across north-central regions of North America in varied kinds of lakes, streams, rivers and estuaries. But it has become rare to locally extinct within the central Mississippi River watershed, as well as several peripheral parts of its range. In addition to a few recent colls. from streams or ponds in FAYE (JC) and MADI (EKY, NY), there is a 1830s collector of R. Peter (MICH, NY) from "Kentucky River", probably in MADI or FAYE.

E. nuttallii differs from *canadensis* in its leaves, which are mostly 1-1.7 mm wide (versus 1.8-2.5 mm), with l/w ca. 5-10 (versus 2-5), and more spaced at growing tips (versus densely overlapping). Its rarely collected flowers are smaller and separate in bud from mother plants soon when mature (versus produced on a long flexuous stalk). In Europe, both *nuttallii* (2n = 48) and *canadensis* (2n = 24 usually) have spread to become locally weedy in eutrophic waters; hybridization remains virtually unknown (Cr, FNA 22).

HAB 2 ~ E? 6. **ABU** g8 s3? -4?

2316--Egeria densa Planch

Hydrocharitaceae: *Egeria [Elodea] densa*

This aquatic species has been widely used in aquaria. It sometimes escapes, and has become locally naturalized in southeastern states (K, SE). The coll. from TODD (MUR) is a confusing mixture of aquatic species.

ALI SA. **HAB** 2 ~ C 6. **ABU** +4.

2317--Najas guadalupensis (Spreng.) Magnus

Najadaceae [Hydrocharitaceae]: *Najas guadalupensis* (var. g.)

This is widespread in lakes and rivers of North and Central America. It is known from scattered locations across Ky., but generally not in eutrophic waters. Although the species has several cytotypes and described varieties, plants of east central states are reportedly the typical variety, with 2n = 24 (FNA 22). Despite earlier reports, that number is predominant among other

eastern species in this "vegetatively plastic" genus (Cr), but hybrids are not documented.

HAB 2,1 ~ C 6. **ABU** g10 s8 -2?

2318--Najas gracillima (A. Braun ex Engelm.) Magnus

Najadaceae [Hydrocharitaceae]: *Najas gracillima*

This occurs mostly in oligotrophic waters of northeastern states and adjacent Canada, and has suffered much historical decline (FNA 22). The few scattered Ky. records mostly come from ponds and slow streams in regions that have less intense agriculture. Some records may need rechecking for minor, which has been confused.

HAB 2 ~ C 6. **ABU** g9 s5? -2?

2319--Najas flexilis (Willd.) Rostk. & Schmidt R

Najadaceae [Hydrocharitaceae]: *Najas flexilis*

This widespread northern species has been reported from Ky. by Gunn (1968), Kellerman (1959) and others, but its presence is not confirmed. Some colls. of *guadalupensis* at DHL were misidentified as *flexilis*.

2320--Najas minor All.

Najadaceae [Hydrocharitaceae]: *Najas minor*

This aquatic has spread across eastern North America, especially in eutrophic waters. The first record from Ky. was provided by Greenwell (1935). A coll. from ROWA (KNK) was initially reported as *N. marina* L. (Cranfill & Thieret 1981).

ALI EU. **HAB** 2 ~ D 6. **ABU** +5*.

2321--Potamogeton diversifolius Raf.

Potamogetonaceae [Zosteraceae]: *Potamogeton diversifolius* (var. d., "P. dimorphus")

This is the most common species of *Potamogeton* in stagnant water across southeastern states, but there is no evidence of distinct varieties or definite hybrids (FNA 22). Floating leaves are typically 3-8.5 mm wide and have obtuse tips; without these leaves, colls. are hard to identify. Plants with broader leaves and more acute tips, especially in flowing waters of major streams and rivers, should be compared with *tennesseensis*, which has been overlooked. See also *spirillus*.

HAB 2 ~ C 6. **ABU** g10 s9 -2?

2322--Potamogeton spirillus Tuckerman R

Potamogetonaceae [Zosteraceae]: *Potamogeton spirillus* (dimorphus)
This northern species has been reported from Ky. by Kellerman (1959) and others, but colls. have not been verified (FNA 22). Colls. that were initially labelled as *spirillus* from FULT (KY-Agr.), JEFF (DHL) and UNIO (GH, KY-Agr.) are probably *diversifolius*. The two species are close and can easily be confused.

2323--*Potamogeton tennesseensis* Fern.

Potamogetonaceae [Zosteraceae]: *Potamogeton tennesseensis*
This globally rare species of larger streams in the central Appalachian has been overlooked in Ky., although it was mapped here by FNA 22. It is close to *epihydus* (which was apparently combined by Cr and other authors) and to *diversifolius*; some intergradation is suspected. *P. tennesseensis* is distinct from *diversifolius* in its larger floating leaves (ca. 8-12 mm wide) with more acute tips; also, stipules are partly adnate to leaves (FNA 22).

Some 1830s colls. of C.W. Short from "Kentucky Rv." are obscure or need to be rechecked, but are tentatively mapped here in FAYE. They were initially labelled "heterophyllum" or "acutifolium" but filed under *epihydus* (at KY), *natans* (at MICH) or *gramineus* (at GH). The only other coll. made in the Kentucky Rv. watershed is from CLAY (GH): E.L. Braun s.n., 7 Jul 1933, Red Bird River, quiet parts of stream.

More recently, *tenesseensis* has been collected in the Cumberland Rv. watershed: Marsh Cr. of MCRE (KY). It has been suspected in the Rockcastle Rv. of LAUR and ROCK, a few riffles below Livingston (sight records of JC and T. Bloom, KSNPC). In Tenn., it occurs in tributaries of the Big South Fork, which flows into Ky. through MCRE (Ch).

HAB 1 ~ D? 6. **ABU** g4? s2? -3?

2324--*Potamogeton epihydus* Raf. R

Potamogetonaceae [Zosteraceae]: *Potamogeton epihydus*
This northern diploid ($2n = 26$) has been reported from Ky. (RAB, M), but it was not mapped here by FNA 22; hybrids may be a source of confusion. The only record included by M was based on a 1830s coll. of C.W. Short from the "Kentucky Rv." (probably in FAYE or MADI), but the coll. appears to have mislaid at KY (check also PH); see notes under *tenesseensis*.

2325--*Potamogeton pusillus* L.

Potamogetonaceae [Zosteraceae]: *Potamogeton pusillus*

This narrow-leaved species is widespread across North America. It is easily confused with *foliosus*, but fruits are distinctive and hybrids are unknown; $2n = 26$ versus 28 (FNA 22). There has also been confusion with closely related plants known as *berchtoldii*; see notes under that name. Further study is needed.

HAB 2 ~ D 6. **ABU** g10 s4? -3?

2326--*Potamogeton berchtoldii* Fieber T

Potamogetonaceae [Zosteraceae]: *Potamogeton berchtoldii* (*pusillus* var. *tenuissimus*)

This has a more northern range than typical *pusillus*. Although treated as a distinct species or subspecies of *pusillus* in several treatments (from F to FNA 22), it may be preferable to treat these plants as var. *tenuissimus* F.K. Mertens & W.D.J. Koch; see also W. Most records from Ky. remain uncertain, and they are provisionally mapped here with typical *pusillus*. FNA 22 mapped typical *pusillus* across Ky., but indicated virtually no records of "ssp. *tenuissimus*." The only known colls. verified by authorities are from JEFF (DHL) and NICH (EKY).

HAB 2 ~ D? 6. **ABU** g10 s5? -2?

2327--*Potamogeton foliosus* Raf.

Potamogetonaceae [Zosteraceae]: *Potamogeton foliosus* (var. f.)
This widespread North American diploid ($2n = 28$) is the most common narrow-leaved species of *Potamogeton* in Ky. Colls. from BULL, HART, KENT and OLDH are referable to var. *macellus* Fern, but that taxon is not generally recognized in recent treatments.

HAB 2 ~ D? 6. **ABU** g10 s9? -2?

2328--*Potamogeton crispus* L.

Potamogetonaceae [Zosteraceae]: *Potamogeton crispus*
This is the only alien species of *Potamogeton* in eastern states (FNA 22), and typical of eutrophic waters (as is *Naias minor*). Its reproduction appears to be largely vegetative, through turions (dormant apices). No hybrids are known with other species in Ky., through several share $2n = 52$. The first Ky. record was provided by Short & Peter (1835).

ALI EU. **HAB** 2 ~ E 6. **ABU** +5.

2329--*Potamogeton pulcher* Tuckerman

Potamogetonaceae [Zosteraceae]: *Potamogeton pulcher*

This has a rather fragmented range from Atlantic states to the Ozark region. It is rare in Ky., generally found in old ponds with stagnant oligotrophic water. *P. pulcher* has distinctive purple spots on stems and petioles; otherwise it is similar to *amplifolius* but with smaller leaves.

HAB 2 ~ C 6. **ABU** g10 s4 -2.

2330--Potamogeton amplifolius Tuckerman R

Potamogetonaceae [Zosteraceae]: *Potamogeton amplifolius*

This is a widespread northern species that has been reported from Ky., but see notes under *illinoensis*.

2331--Potamogeton nodosus Poir.

Potamogetonaceae [Zosteraceae]: *Potamogeton nodosus* (*americanus*)

This widespread North American species is known to form hybrids with several other tetraploids ($2n = 52$; FNA 22). The closely related northern species, *P. natans* L., is not verified for Ky. but may have been confused with *nodosus* in some earlier records (M).

HAB 2 ~ D? 6. **ABU** g10 s9 -1.

2332--Potamogeton gramineus L. R

Potamogetonaceae [Zosteraceae]: *Potamogeton gramineus*

This highly variable northern, circumboreal species is known to hybridize with several other tetraploids ($2n = 52$) as well as the octoploid *illinoensis*, which has been confused. *P. gramineus* was mapped in Ky. by FNA 22, but no verified colls. have been seen. It was reported from Ky. by Short et al. (1833) and Kellerman (1965); a potential coll. of C.W. Short (PH) needs checking. Another coll. of C.W. Short (dated 1837 at GH) was previously filed under *gramineus* (and originally labelled "heterophyllum") but appears to be *tennesseensis* instead.

2333--Potamogeton illinoensis Morong

Potamogetonaceae [Zosteraceae]: *Potamogeton illinoensis* (*heterophyllum*, "lucens")

This is widespread across North America. Old or obscure records of *amplifolius* from Ky. are provisionally included here, pending more detailed examination. Submersed and floating leaves are ca. 2-5 cm wide in both species, but *illinoensis* differs in several characters (FNA 22); and $2n = 104$ (versus 52). Hybrids have been reported.

P. amplifolius is a northern and western species, not mapped in Ky. by FNA 22 but "to be expected." There is a coll. from LINC (PH) determined in 1953 by "H.A.W." as *amplifolius*, which needs rechecking. This coll. was made by C.W. Short in the 1830s in the "Dicks Rv near Crab Orchard", and was originally named *P. lucens* auct. (not L.). A recent coll. from Buck Creek in PULA (KNK) was referred to *amplifolius* by Clark et al. (2005), but this also needs to be rechecked. *P. illinoensis* is expected in the Dix Rv., since it is locally abundant in the Little South Fork, a similar stream to the south.

HAB 1 ~ D 6. **ABU** g10 s4? -3.

2334--Stuckenia pectinata

Potamogetonaceae [Zosteraceae]: *Stuckenia* [*Potamogeton*] *pectinata*

This cosmopolitan species was generally included within *Potamogeton* until the 1990s (FNA 22); $2n = 78$ in *Stuckenia* (versus mostly 26 and 52).

HAB 2,1 ~ D? 6. **ABU** g10 s8? -2?

2335--Zannichellia palustris L.

Zannichelliaceae [Zosteraceae]: *Zannichellia palustris*

This rhizomatous aquatic is widespread in eutrophic or brackish waters of North America and elsewhere. The genus is currently monotypic, but several cytotypes are known; $2n = 24-48$. There are two clusters of Ky. records: in ponds of the central Bluegrass region; and along the lower Tennessee and Cumberland River impoundments (Meade et al. (1997).

HAB 2 ~ E 6. **ABU** g10 s8? -1?

2336--Dioscorea quaternata J.F. Gmel.

Dioscoreaceae: *Dioscorea* <Macropoda> *quaternata* (*villosa** var. *glabrifolia*)

This occurs mostly in mesic to subxeric woods of east-central states. It is relatively abundant throughout Ky. and in other Appalachian states, but much less common on the Coastal Plain, where it is largely replaced by *villosa* (W). *D. quaternata* does occur in more northern states, but it has often been combined with, or reported as, *villosa* in floristic manuals.

HAB 7,8,5,11 C 2. **ABU** g10 s10 -2.

2337--Dioscorea villosa L.

Dioscoreaceae: *Dioscorea* <Macropoda> *villosa* (var. v.)

This is widespread in eastern states but mapping here is provisional; more study of is needed in Ky. based on recent literature. With incomplete colls. *villosa* is easily confused with *quaternata*, which has been combined in some

treatments (e.g. FNA 26). It usually occurs on damper sites, often in riparian woods and swamps.

D. villosa is best distinguished (Al-Shehbaz & Schubert 1989; Cr, W) by having a mostly twining stem with alternate leaves (except rarely, at the base with short internodes, appearing almost whorled). *D. quaternata* has lower leaves in whorls of 4-7, and only the upper stem twines with alternate leaves. Also, *villosa* has stems with 8-14 narrowly winged ribs (versus terete); its rhizomes are ca. 5-10 mm thick (versus 10-15 mm), relatively straight and little-branched (versus often contorted and branched); fruits tend to be smaller (F); $2n = ?20$ or 60 versus 36 or 54 (Cr, FNA 26).

HAB 4,6,8,7 C 3. **ABU** g9 s9 -3.

2338--*Dioscorea hirticaulis* Bartlett T

Dioscoreaceae: *Dioscorea* <Macropoda> *hirticaulis* (*villosa* var. h.) This poorly understood southeastern taxon has been variously interpreted (F, Cr; Al-Shehbaz & Schubert 1989; FNA 26; W). Within the Ohio Valley, plants named *hirticaulis* may just represent occasional hairy plants of *villosa*, but a distinct variety or species may be justified on the Coastal Plain. It has been reported from Ky. by BA and Rogers (1941), but no complete convincing colls. have been located. There is a coll. from CALD (EKY, KY) that may be referred here: M.E. Wharton & M.R. Beckett #215. *D. hirticaulis* has also been reported from s. Ind. (D).

2339--*Dioscorea polystachya* Turcz.

Dioscoreaceae: *Dioscorea* <Enantiophyllum> *polystachya* (*batatas*, "*oppositifolia*")

This has been cultivated for its edible aerial tubers, and perhaps as an ornamental. It is now widely naturalized in east-central states, from Appalachian to Ozarkian regions (K, SE). The first Ky. record was provided by Wharton (1945). It may well occur in all Ky. counties; see also "*bulbifera*" of SE.

D. polystachya ($2n = 140-144$) may be a true *Dioscorea*, and the North America plants could potentially be transferred to *Merione* (as reviewed by W). *D. bulbifera* L. is a closely related pantropical species with unlobed (versus lobed) leaves, which has been confused with *polystachya* in some mappings (SE). In North America, *bulbifera* is largely restricted to subtropical transitions on the southeastern Coastal Plain (K, W).

ALI AS. **HAB** f-10,8,7 C 4. **ABU** +5.

2340--*Aletris farinosa* L.

Nartheceae [Liliaceae]: *Aletris farinosa*

This is widespread on seasonally dry sandy soils in eastern states. Although previously included by many authors in Liliaceae (*sensu lato*), *Aletris* ($2n = 26$) belongs in Nartheceae. That is a small family with relictual distribution in humid temperate regions of East Asia, eastern North America and western Europe; it is allied with Discorales rather than Liliales (APG, W).

HAB 10,9,11 B 5. **ABU** g9 s8 -4.

2341--*Veratrum woodii* J.W. Robbins ex Wood

Melanthiaceae [Liliaceae]: *Veratrum* (*Melanthium*) *woodii*

This remarkable poisonous species (with complex alkaloids like others in the genus) is widely scattered across east-central states, but common only in some midwestern regions, especially the Ozarks of Mo. (Y; PL). In Ky. and Tenn. the few records are clustered in calcareous hills that may have been refuges for mesic forests during past disturbances. Flowering often does not occur, and in Ill. Ebinger (1993) indicated that it may be promoted by fires. In Ky. no response to fire has been suggested, but the population at Mammoth Cave National Park did flower well after unusually dry years in the 1990s (R. Seymour & C. Lapham, pers. comm.).

V. woodii is the only North American species of *Veratrum* (*sensu lato*) with blackish, purplish or maroon flowers, versus whitish, creamy, greenish or brownish (when dried). Such dark-flowered species probably form the primary division within *Veratrum*, rather than the variously interpreted *Melanthium* (Liao et al. 2007; see also citations of W).

HAB 5,11 E 1. **ABU** g6 s4 -3.

2342--*Veratrum parviflorum* Michx.

Melanthiaceae [Liliaceae]: *Veratrum* (*Melanthium*) *parviflorum*

This southern Appalachian species is common only at moderate to high elevation, especially in the Blue Ridge. In addition to the disjunct colls. from southeastern counties of Ky., there is a coll. labeled as from ROWA (MDKY) but the data are highly dubious (Campbell et al. 1992).

HAB 5,11 B 1. **ABU** g6 s4 =.

2343--*Veratrum virginicum* (L.) Ait.

Melanthiaceae [Liliaceae]: *Veratrum* (*Melanthium**) *virginicum*

This has a broad range across southeastern states, but it is rare in most of them, with very few sites in Ill., Ky. and Tenn. (NS, PL). Although the species has often been treated in *Melanthium*, that genus is not supported by recent analysis (as cited in W; see also Liao et al. 2007). In Ky. species of *Veratrum* $2n = 16$ (FNA 26).

HAB 9,6 B 3. **ABU** g7 s2 -2?

2344--*Amianthium muscitoxicum* (Walt.) Gray

Melanthiaceae [Liliaceae]: *Amianthium* (*Zigadenus*) *muscitoxicum*

This monotypic southeastern genus is largely restricted to acid infertile soils in thin woods and grassland; $2n = 32$ (W). The only Ky. recent records are from a few sites on Cumberland Mt. in BELL (TENN) and HARL (KSNPC), near the Va. state line. There is also an old coll. from TODD (PH) that was made by C.W. Short in the 1830s: "near Elkton, meadows and barrens."

HAB 7,10 B 4. **ABU** g8 s2 -3?

2345--*Stenanthium leimanthoides* (Gray) Zomlefer & Judd R

Melanthiaceae [Liliaceae]: *Stenanthium* (*Zigadenus*) *leimanthoides* (*densus** sensu lato)

This is known mostly from the southeastern Coastal Plain and southern Appalachians, but in Tenn. there are disjunct records from the Cumberland Plateau and adjacent oak barrens. It has been reported from Ky. (Cr, FNA 26), apparently based on a coll. not yet relocated (A. Cronquist, pers. comm. to MM).

The closely related *S. densus* (Desr.) Zomlefer & Judd, sensu stricto, is restricted to the southeastern Coastal Plain (Cr, FNA 26, W). Inclusion of these species in *Stenanthium* is well supported; $2n = 20$ throughout the genus.

2346--*Stenanthium gramineum* (Ker-Gawl.) Morong

Melanthiaceae [Liliaceae]: *Stenanthium gramineum* {vars. combined}

This occurs widely in east-central states, but is centered in Appalachian and Ozarkian regions. It is a conservative species, surviving in scattered remnants of thin swampy woods and seasonally wet meadows, including some rights-of-way, especially on medium-acid soils. In Ky. its distribution is highly fragmented, and several populations have disappeared since 1950; similar declines have been documented in s. Ill. (Edgin 2004).

Varieties are combined here, as in most recent treatments (e.g. Cr, FNA 26), but further study is warranted (W). Colls. from CALD, FAYE, FLEM, HART,

HOPK, ROCK and ROWA are referable to var. *robusta* (S. Wats.) Fern., which may be typical of deeper swamps or relatively fertile soils. Colls. from LAUR, MCRE, PULA and WHIT are referable to var. *micranthum* Fern., which may be typical of streamhead seeps on infertile soils of the Cumberland Plateau. The latter appears distinctive, and needs to be compared with *S. diffusa* Wofford, which was recently described from sandstone rockhouses in adjacent Tenn. (Wofford 2006) and is expected in Ky.

HAB 9,6,4 C? 4. **ABU** g8 s5 -5.

2347--*Chamaelirium luteum* (L.) Gray

Melanthiaceae <Chionigraphideae> [Liliaceae]: *Chamaelirium luteum* (obovale)

This largely dioecious species is widely scattered over southeastern states. In Ky. it is generally restricted to mesic or submesic woods, especially on sandy soils and perhaps never on calcareous soils. It is the only species generally recognized in the genus, which is allied with the East Asian *Chionigraphis*; $2n = 24$ (APG, W and citations). A coll. from WOLF (KY) has been annotated var. *obovale* by E.W. Chester, which needs further assessment (W).

HAB 7,6,9 B 3. **ABU** g9 s8 -3.

2348--*Xerophyllum asphodeloides* (L.) Nutt.

Melanthiaceae <Xerophylleae> [Liliaceae]: *Xerophyllum asphodeloides*

In Ky. this largely southern Appalachian species is known only from a coll. of S. Price (MO), made ca. 1900 in EDMO or WARR (Browne 1962; M). There is only one other species in the genus, which itself can be considered the only genus in segregated family *Xerophyllaceae*; $2n = 30$ (W; and citations).

HAB 12,11,10 A 3? **ABU** g7 s1 -6?

2349--*Trillium sulcatum* Patrick

Melanthiaceae <Parideae> [Liliaceae**]: *Trillium sulcatum* (*erectum* var. s.)

This southern Appalachian species occurs mostly west of the Blue Ridge. In Ky., many plants appear transitional to the more northeastern *erectum*; the combination *T. erectum* var. *sulcatum* Barksdale is available if desired. However, these two taxa appear generally distinct across most of their ranges (Patrick 1984; FNA 26; W); $2n = 10$ in both (as in all *Trillium*), but chromosomes differ in morphology (Hill 2005).

T. sulcatum is distinguished by its cup-shaped flowers, with "petals carried somewhat forward to recurved-spreading in distal half... ovate to broadly ovate-overlapping" (versus "spreading, carried in same plane as sepals or

ascending slightly... lanceolate, ovate-lanceolate, or occasionally ovate"); it has larger stamens (15-18 mm long versus 5-15 mm) and ovaries (14-18 mm long versus 5-10 mm); its smell is "faintly musty, like fresh fungus" (versus "fetid, like a wet dog"); pedicels are relatively long and often flexed or declined (versus erect). Flowers are usually maroon (petals) and purple (sepals); a few paler colls. are referable to forma *albolutescens* Patrick (e.g. from CART and HARL at KY). Without flowers, leaves may be tentatively distinguished by their "obovate to broadly elliptic shape" (versus "broadly rhombic to ovate-rhombic").

HAB 5 C 1. **ABU** g7? s7? -2.

2350--*Trillium erectum* L.

Melanthiaceae <Parideae> [Liliaceae**]: *Trillium erectum* (var. e.)
See notes under *sulcatum*, which is difficult to distinguish in several colls. *T. erectum* varies much in flower color, but segregates are not generally recognized in recent treatments (W). Several scattered colls. have been referred to var. *album* (Michx.) Pursh, and one to var. *flavum* Eason (HARL for WKY).

HAB 5 C 1. **ABU** g8 s8 -2.

2351--*Trillium flexipes* Raf.

Melanthiaceae <Parideae> [Liliaceae**]: *Trillium flexipes* (*gleasonii*, "cernuum"; *erectum* var. *vaseyi*)

This has a largely midwestern range, and is largely restricted to mesic woods on base-rich soils (FNA 26). In early work on the flora of Ky. (M), *flexipes* was confused with *T. erectum* or the northeastern species, *T. cernuum* L. In the central Bluegrass, Short (1928-9) found it only in "rich, secluded woodlands."

Many widely scattered colls. are referable to the purplish forma *walpolei* (Farw.) Fern., and intermediates also occur.

HAB 5 E 1. **ABU** g8 s8 -2.

2352--*Trillium grandiflorum* (Michx.) Salisb.

Melanthiaceae <Parideae> [Liliaceae**]: *Trillium grandiflorum*
This is a widespread northeastern species. In Ky. it occurs mostly in Appalachian region or adjacent hills. Some outlying records may be doubted, including the colls. from FAYE (KY) and NICH (EKY), which could be mislabeled or from cultivation. There are also sight records of B from EDMO and TODD, where this species might be expected in sandstone ravines.

HAB 5 D 1. **ABU** g9 s8 -3.

2353--*Trillium nivale* Riddell

Melanthiaceae <Parideae> [Liliaceae**]: *Trillium nivale*
This largely midwestern species is restricted to base-rich soils. In Ky. native plants are verified only from two localities in tributary ravines along the Palisades of the Kentucky Rv. The limestones here are partly dolomitic, and the extensive populations in s. Ohio are on largely dolomitic soils (Braun 1967). *T. nivale* has also been reported from Otter Creek State Park in MEAD (C. Cornett, pers. comm. to F. Case), across the Ohio Rv. from known plants in s. Ind. And a small wild population has been established from a planting in FAYE.

HAB 11,5,12 + E 2. **ABU** g7 s2 -2?

2354--*Trillium pusillum* Michx.

Melanthiaceae <Parideae> [Liliaceae**]: *Trillium pusillum* (var. *indet.*)
Broadly defined, this is a complex southeastern species (e.g. FNA 26), but there is much variation that probably involves clinal trends and local genetic drift. Appropriate treatment remains uncertain (W); see also notes under the segregate, *ozarkanum*. The few plants mapped here resemble typical *pusillum* of the Carolina Coastal Plain, which occur in wooded edges of calcareous wetlands (W). These Ky. records are from swampy woods on calcareous plains and lowlands of south-central counties.

The plants mapped here may be grouped with the taxon named informally as "alabamicum" by S. Farmer in Tenn. and Ala. (W). That taxon differs from *ozarkanum* in its elliptic (versus ovate) leaves with more rounded tip; and its sepals less narrowed (l/w ca. 2.7-3.1 versus 3-4.3) and generally smaller (ca. 18-25 x 6-8 mm versus 22-30 x 6-11 mm).

HAB 6,9 C 2. **ABU** g4? s2 -4.

2355--*Trillium ozarkanum* Palmer & Steyermark

Melanthiaceae <Parideae> [Liliaceae**]: *Trillium ozarkanum* (*pusillum* var. o.*)

In Ky. this largely Ozarkian taxon is known from a few disjunct sites in mesic to subxeric woods of south-central counties. It appears closer to *T. texanum* Buckl. than to typical *pusillum* or other southeastern segregates (Timmerman-Erskine et al. 2003). The Ky. plants may be significantly more robust than typical *ozarkanum*, with larger leaves and bracts, but further analysis is needed (S. Farmer, pers. comm. to W et al.).

HAB 11,7 C 3. **ABU** g6 s3 -4.

2356--Trillium undulatum Willd.

Melanthiaceae <Parideae> [Liliaceae**]: Trillium undulatum

This northeastern species is restricted to cool moist to damp woods on acid soils. In Ky. it occurs only at high elevation in the Cumberland Mts.

HAB 5 B 1. **ABU** g9 s5 =.

2357--Trillium cuneatum Raf.

Melanthiaceae <Parideae> [Liliaceae**]: Trillium <Phyllanthum> cuneatum (var. c., T. hugeri)

This occurs on base-rich soils from the Carolina Piedmont to the southern Interior Low Plateaus and adjacent Gulf Coastal Plain. In Ky. the anomalous disjunct coll. from "rich woods north of Augusta" in BRAC (KY) was made by a student, but with no other reason to doubt authenticity; it has an unusually pale, greenish ovary.

Some populations in MCRE and WAYN appear transitional to luteum, but trilliolgists insist that these species are distinct (FNA 26). T. cuneatum typically has purple to maroon flowers, sometimes greenish or yellowish, but never the "greenish to buttercup yellow" (F) of luteum. The odor of is "musk- or spice-scented or foetid" in cuneatum, versus "lemon-scented" in luteum (Cr). See also notes under viride.

HAB 5 D 1. **ABU** g8 s8 -3.

2358--Trillium luteum (Muhl.) Harbison

Melanthiaceae <Parideae> [Liliaceae**]: Trillium <Phyllanthum> luteum (cuneatum var. l.)

This is largely restricted to base-rich soils from the southern Appalachians to the southern Cumberland Plateau and adjacent hills. There has been some confusion with viride, within which Gl included luteum and cuneatum as varieties; see also notes under cuneatum. The disjunct coll. from CLAR (EKY) is verified but it is an atypically small plant; it was found mixed with sessile near old buildings where past planting is possible.

HAB 5 D 1. **ABU** g7 s7 -3.

2359--Trillium viride L.C. Beck T

Melanthiaceae <Parideae> [Liliaceae**]: Trillium <Phyllanthum> viride

This largely Ozarkian species has been reported from Ky. by BA, but typical plants probably do not occur here. A few western colls., from CHRI, TODD and WARR (EKY, WKY), appear transitional from cuneatum to viride, but

they may just be greenish-flowered plants of cuneatum (M, FNA 26). The broad earlier concept of T. viride (e.g. F) has become reduced to include only plants from e. Mo. and sw. Ill. BA also reported T. viridescens Nutt., which some authors have combined with viride, but others have separated as a more western taxon (FNA 26).

2360--Trillium sessile L.

Melanthiaceae <Parideae> [Liliaceae**]: Trillium <Phyllanthum> sessile
This midwestern species occurs on base-rich soils in varied types of woods, including moderately disturbed areas. In the central Bluegrass, Short (1828-9) noted: "Grows in rich woods or grass grounds." Further west, his account of the "barrens" also indicates that Trilliums such as sessile did occur in relatively open land.

T. sessile is sometimes confused with cuneatum or (in forms with paler flowers) luteum. In addition to its relatively elongated stigmas and stamens, sessile generally has smaller flowers and leaves (FNA 26). In Ky. some colls. are referable to forma viridiflorum Beyer (GRAV, JEFF, JESS, MEAD) or forma luteum (CAMP). A coll. from HENR (KY) has four sets of petals and sepals.

HAB 7,5,11 E 2. **ABU** g9 s9 -3.

2361--Trillium recurvatum Beck

Melanthiaceae <Parideae> [Liliaceae**]: Trillium <Phyllanthum> recurvatum

This is largely midwestern but extends locally into the southern Cumberland Plateau, Blue Ridge and Piedmont (FNA 26, W). Although generally considered a species of somewhat mesic woods, recurvatum was also reported from the "barrens of Ky." by Short (1836, 1840). In Ky. some colls. (EKY, KY) are referable (following F) to the partly yellow forma luteum Clute (GRAY, UNIO) or the completely yellow forma shayi Palmer & Steyer. (GRAY, LYON, TRIG, UNIO). A student coll. from FAYE (KY) is excluded since it has dubious label data.

HAB 5,7,11,4 D 1. **ABU** g8 s8 -3.

2362--Uvularia sessilifolia L.

Colchicaceae [Liliaceae**]: Uvularia sessilifolia

This is widespread in eastern North America, except most of the Gulf Coastal Plain, usually growing in damp woods on floodplain terraces and toe-slopes with medium acid soil. Despite extensive potential habitat in Ky., sessilifolia

is uncommon to rare and largely restricted to sites that have escaped intensive agricultural disturbance, clearance and drainage. The genus *Uvularia* is endemic to eastern North America, with 5-6 remarkably distinct species, and has been placed in Colchicaceae based on firm evidence; $2n = 14$ in all taxa (see sources of W).

HAB 6,4,5 C 2. **ABU** g9 s7 -3.

2363--*Uvularia puberula* Michx.

Colchicaceae [Liliaceae**]: *Uvularia puberula* (var. *puberula*; *pudica*)
Typical *puberula* occurs mostly in upland woods of central and southern Appalachian regions; it is common in e. Va. close to Ky. (F, Cr, HW+, FNA 26). There is a rather incomplete coll. of this species from BELL (TENN): L. Pounds CG85-31.5, 24 Apr 1985, Cumberland Gap National Historic Park, Ridge Trail near Butcher Gap. Also, J. Kiser (pers. comm.) has recently collected it (for EKY) from LETC in Pine Mountain Wildlife Management Area at Scuttlehole Gap.

U. puberula differs from *sessilifolia* in its styles, which are separate to well below the middle (versus only in the upper 1/3 or 1/4); ovaries, sessile (versus distinctly stipitate); leaves, bright green on both sides (versus glaucous beneath); stems, puberulent in lines (versus glabrous); and rhizomes, very short with clustered roots (versus elongate, with scattered roots).

HAB 11,5,7 B 2. **ABU** g6 s1 =.

2364--*Uvularia perfoliata* L.

Colchicaceae [Liliaceae**]: *Uvularia perfoliata*
This occurs mostly in mesic to subxeric woods on medium acid soils in Appalachian regions and adjacent hills. It extends locally west to the southern Ozark-Ouachita region and onto the southeastern Coastal Plains (K, PL, W), but it is rare in most of the central Mississippi Valley, with a fairly abrupt boundary in s. Ind., w. Ky. and w. Tenn.

HAB 5,11 C 1. **ABU** g9 s9 -2.

2365--*Uvularia grandiflora* Sm.

Colchicaceae [Liliaceae**]: *Uvularia grandiflora*
This occurs mostly in mesic woods on base-rich soils in eastern states, except the southeastern Coastal Plain.

HAB 5 D 1. **ABU** g9 s9 -3.

2366--*Medeola virginiana* L.

Liliaceae <Medeoloideae>: *Medeola virginiana*

This is largely restricted to mesic woods on strongly acid soils in northeastern and Appalachian regions; $2n = 14$.

HAB 5,11 A 1. **ABU** g9 s8 -2.

2367--*Clintonia umbellulata* (Michx.) Morong

Liliaceae <Medeoloideae>: *Clintonia umbellulata*

This is restricted to central and southern Appalachian regions, usually in mesic woods on strongly acid soils. The species is somewhat variable in leaf shape, flower color and fruit color. A population in POWE has unusually short orbicular leaves and relatively purplish flowers (D. Dourson, pers. comm.).

Occasional plants have suggested transitions to the more northern *C. borealis* (Ait.) Raf., but there is no definitive evidence of intergradation between these two species (FNA 26). Much *borealis* has $2n = 32$ reported, in addition to $2n = 28$; in all other *Clintonia* species of North America, $2n = 28$.

HAB 5,11,6 A 1. **ABU** g8 s8 -1.

2368--*Lilium superbum* L.

Liliaceae: *Lilium superbum* (*canadense* ssp. s.)

This southeastern species has been recorded from Black Mt. in the east and some swampy lowlands in the west. Also, intervening localities have recently been discovered along banks of the Big South Fork in Ky. (MCRE at EKY) and Tenn., and on uplands on the Cumberland Plateau (LAUR at EKY; Libby et al. 1997).

There has been some confusion with the closely related midwestern *michiganense*. Hybridization among related species of *Lilium* is often indicated; $2n = 24$ in all eastern species. There may be intermediates in western regions of Ky. For example, the coll. from HARD (KY) was initially determined as *michiganense* (Cranfill 1991), but it has large anthers and smooth leaves that suggest *superbum*.

HAB 7,4,6,5 D 3. **ABU** g8 s4 -3.

2369--*Lilium michiganense* Farw.

Liliaceae: *Lilium michiganense* (*canadense* ssp. m.)

This largely midwestern species is widely scattered over central and western regions of Ky., but no large secure populations are known. Most records come from single plants or small groups of non-flowering plants in deep shade. Like other species of *Lilium*, *michiganense* appears to do best in thin woods and

edges with a moderate disturbance regime that has been largely lost in the modern landscape. Rooting of hogs may have been a major factor restricting the species. There has been some confusion with other species, and some colls. should be rechecked, especially those lacking flowers or capsules. Some integradation with superbum may have occurred; see notes under that species. **HAB** 7,4,6,5 E 3. **ABU** g8 s6 -5.

2370--Lilium canadense L.

Liliaceae: *Lilium canadense* (var. c.)

This largely Appalachian species is recorded from scattered sites in western regions of Ky., but some colls. are difficult to distinguish from michiganense. The relatively southern and western segregate, *L. canadense* var. *editorum* Fern., has been reported from BULL (Gunn 1968) but not confirmed. This variety has not been recognized in most recent treatments (FNA 26). Var. *editorum* was initially distinguished (F) by its red flower color (versus yellow to orange), with relatively narrow tube and petals (8-13 mm wide versus 12-20 mm), and leaves elliptic to ovate, scarcely attenuate (versus broadly lanceolate, attenuate).

HAB 7,4,6,5 C 3. **ABU** g8 s7 -3.

2371--Lilium philadelphicum L.

Liliaceae: *Lilium philadelphicum* (var. p.)

Typical philadelphicum has a largely Appalachian and northeastern range. In Ky. verified records are restricted to the Appalachian Cliff Section, especially along roads on ridges. It is a rare remnant of grassy open pine-oak woods, probably maintained by fire in the past. Reports from the Mammoth Cave area (EDMO) are based on misidentified michiganense (at the park's herbarium).

The distinct western segregatae, var. *andinum* (Nutt.) Ker-Gawl., is less robust, with narrower leaves and fewer whorls, but it may have relatively long capsules. Var. *andinum* can be expected in northeastern counties of Ky., since it is known in se. Ohio and it was reported from Ky. by F. However, the basis for identification of *andinum* needs clarification; capsule length cannot be relied on as a key character (FNA 26).

HAB 10,7,11 B 4. **ABU** g7 s4 -5.

2372--Lilium philippinense Baker C

Liliaceae: *Lilium philippinense*

This cultivated species has been reported from Ky. (Cr) in MCRE (BA), and perhaps PULA (M). It is not clear if these colls. were from persistent plantings or truly spontaneous.

ALI AS.

2373--Lilium lancifolium Thunb.

Liliaceae: *Lilium lancifolium* (*tigrinum*)

This is a popular cultivated species ("tiger-lily") that sometimes persists in eastern states. It produces bulblets in leaf-axils, which may allow local spread.

ALI AS. **HAB** H-10 D 4. **ABU** +4.

2374--Erythronium umbilicatum Parks & Hardin R

Liliaceae: *Erythronium umbilicatum*

This largely southern Appalachian diploid ($2n = 24$) has been reported from Ky. by Parks & Hardin (1963), FNA 26 and others). However, these reports may just be based on misidentifications; see W for a detailed key. The name *umbilicatum* has been applied to some rather inadequate colls. of *albidum* (from CALL & MARS at MUR) and *americanum* (from MENI in M; POWE at NCU). Parks & Hardin cited a coll. from CHRI (Hardin #383 at US) that has not been relocated; they did not map it. L. Pounds reported the species in 1986 to the National Park Service, based perhaps on a coll. from the Cumberland Gap area in HARL (check TENN). There are also disjunct western records from nc. Tenn. (Ch).

2375--Erythronium rostratum W. Wolf

Liliaceae: *Erythronium rostratum*

This largely diploid species occurs mostly in the Ozark region, southern Interior Low Plateaus and southern Cumberland Plateau (FNA 26). However, there are remarkable disjunctions in se. Ohio (Scioto Co.), discovered by E.L. Braun in 1964, and in ne. Ky. (Cusick 1989).

HAB 5,11,7 C 1. **ABU** g10 s6 -1.

2376--Erythronium americanum Ker-Gawl.

Liliaceae: *Erythronium americanum*

This tetraploid ($2n = 48$) is widespread in eastern North America, usually in strictly mesic woods, but it is generally absent from areas that have been cleared or intensively farmed in the past.

HAB 5,11,7 D 1. **ABU** g10 s10 -3.

2377--Erythronium albidum Nutt.

Liliaceae: *Erythronium albidum*

In Ky. this largely midwestern species is restricted to calcareous soils, but occurs in varied kinds of woods, from damp to dry; on slopes it is usually associated with warmer aspects. Without its distinctive white flowers, which usually open in April, *albidum* cannot be easily distinguished from *americanum*, which usually flowers in late April or early May (F, Cr, FNA 26, W). Its fruits tend to be more rounded, slightly apiculate or slightly depressed at summit (versus truncate or apiculate); leaves tend to be narrower (mostly 1.5-4 cm versus 2-5 cm), often in extensive non-flowering patches; $2n = 44$ (versus 48).

HAB 7,5,11 E 1. **ABU** g9 s9 -4.

2378--*Prosartes lanuginosa* (Michx.) D. Don

Liliaceae** <Streptopoideae>: *Prosartes* ("Disporum") *lanuginosa*
This has a much broader range than *maculata*, also centered in the Appalachians but extending further into adjacent regions. There is a remarkable extension along the Cumberland Rv. into w. Ky. and w. Tenn. (K, PL). *P. lanuginosa* typically occurs on slightly drier, less fertile soils than *maculata*, and differs in several useful characters; $2n = 18$ versus 12 (FNA 26, W).

HAB 5,11 C 1. **ABU** g8 s8 -2.

2379--*Prosartes maculata* (Buckl.) A. Gray

Liliaceae** <Streptopoideae>: *Prosartes* ("Disporum") *maculata*
This is known mostly from the central and southern Appalachians, in mesic woods on fertile soils. In Ky. it is uncommon to rare, even within suitable habitat.

HAB 5 D 1. **ABU** g7 s6 -3.

2380--*Streptopus lanceolatus* (Aiton) Reveal

Liliaceae** <Streptopoideae>: *Streptopus lanceolatus* (*roseus* var. *perspectus*)
This largely northeastern diploid ($2n = 16$) has often been treated as *S. roseus* Michx. Typical *lanceolatus* includes *S. roseus* var. *perspectus* Fassett, and in Ky. it is known only from high elevation on Black Mt. Reports from Ky. of the southern Appalachian *S. roseus* var. *roseus* and the upper midwestern var. *longipes* (Fern.) Fassett appear to be erroneous (M).

HAB 5 C 1. **ABU** g8 s2 -1.

2381--*Smilax herbacea* L.

Smilacaceae [Liliaceae]: *Smilax* <Nemexia> *herbacea* (var. h.)

Mapping here is provisional. Some colls. of this largely Appalachian species are not easily distinguished from *pulverulenta* or *lasioneura*, or need to be rechecked. See notes under those segregates. Although these three taxa have been treated as species in several treatments, doubts linger and Cr treated them as varieties. While ranges are different, there is considerable overlap, and habitats are similar; $2n = 26$ in all reports.

HAB 7,5 D? 3? **ABU** g9 s9? -2?

2382--*Smilax lasioneura* Hook.

Smilacaceae [Liliaceae]: *Smilax* <Nemexia> *lasioneura* (herbacea var. l.*)
This largely midwestern species is close to typical herbacea, and some colls. from Ky. have been hard to distinguish. W also noted that "material from Virginia is ambiguous." *S. lasioneura* has relatively short peduncles: usually 1-3 x subtending petiole and up to 12 cm (versus 4-8 x petiole and up to 30 cm). Also its leaves are pale green beneath and puberulent on veins (versus glaucous and usually glabrous).

HAB 7,5? E? 3? **ABU** g9 s8? -3?

2383--*Smilax pulverulenta* Michx.

Smilacaceae [Liliaceae]: *Smilax* <Nemexia> *pulverulenta* (herbacea var. p.*)
This is centered in calcareous regions of east-central states; the Appalachian-Ozark disjunction mapped in FNA 26 may just reflect lack of data recorded from Ky. and Tenn. *S. pulverulenta* is distinct from herbacea and *lasioneura* in the relatively dark shiny green color of lower leaf surfaces (which are pubescent like *lasioneura*); its relatively long petioles, more or less equalling blades (versus shorter), a third to as long as peduncles (versus 1/10 to 1/3); and its berries black (versus blue, glaucous). Some colls. of *pulverulenta* from Ky. have relatively glabrous leaves, and may be transitional to herbacea.

HAB 7,5? C? 3? **ABU** g8 s8? -2?

2384--*Smilax hugeri* (Small) J.B.S. Norton ex Pennell T

Smilacaceae [Liliaceae]: *Smilax* <Nemexia> *hugeri* (*ecirrata* var. *hugeri**)
This is generally distinct from *ecirrata* and has a more restricted range, mostly from N.Car. to Ala.; $2n = 26$ versus 52 (FNA 26, W). It is verified in e. Tenn. (from Grundy Co. at GH), but some colls. from Tenn. are difficult to distinguish from *ecirrata* (Mangaly 1968). Much *ecirrata* has been erroneously referred to *hugeri* in Ky. and elsewhere, due to misleading treatment in G1 and elsewhere; leaves of both species are green and more or less puberulent beneath. A comprehensive review of Ky. colls. is still needed.

S. hugeri differs from *ecirrata* in its typically less numerous leaf blades (ca. 4-8 versus 5-13), which are narrowly ovate or elliptic (l/w ca. 1.7-2 versus 1.4-1.7), with a cuneate base (versus broadly ovate with a cordate base); its usually less numerous flowers (up to 12 per umbel, versus 25); its shorter tepals (3-3.5 mm versus 3.5-4 mm); its stamens shorter than filaments (versus more or less equalling); and its berries glaucous (versus not) with fewer seeds (2-3 versus 3-5).

2385--*Smilax biltmoreana* (Small) J.B.S. Norton ex Pennell T
Smilacaceae [Liliaceae]: *Smilax* <Nemexia> *biltmoreana* (*ecirrata* var. b.*)
This diploid is generally rare, known mostly from the Blue Ridge region but also disjunct elsewhere in southeastern states. It differs from *ecirrata* in its leaves, which are less numerous (5-7 versus 8-13), narrower (l/w ca. 1.8-3 versus 1.4-1.7), glabrous and glaucous beneath (versus pubescent and green); also its lowest peduncles usually stem from leaf axils (versus bract axils). There is a coll. from WARR (NCU) determined by Mangaly (1968) as this species; see also FNA 26. While this record may be valid, it is desirable to review all material that has been referred to *ecirrata*, *hugeri* or *biltmoreana* in the state, before a definitive treatment for these taxa.

2386--*Smilax ecirrata* (Engelm. ex Kunth) S. Wats.
Smilacaceae [Liliaceae]: *Smilax* <Nemexia> *ecirrata* (var. e.*)
This largely midwestern tetraploid (2n = 26) has been confused with the more southeastern diploids, *hugeri* and *biltmoreana* (FNA 26). See notes under those two taxa, which have distinctly narrower leaves that tend to be less numerous (on average).

In the upper midwest there are apparently stabilized hybrids of *ecirrata* with *lasioneura* known as *S. illinoensis* Mangaly, and these may be expected in Ky. (FNA 26). *S. illinoensis* differs from *ecirrata* in its more numerous flowers (usually more than 25), on longer peduncles; its taller stems, with more leaves and frequent tendrils (versus virtually never); and its narrower leaves.
HAB 5,7 C 2. **ABU** g9 s8 -2.

2387--*Smilax rotundifolia* L.
Smilacaceae [Liliaceae]: *Smilax* <China> *rotundifolia*
This is widespread in eastern states except the upper mid-west. In Ky. it is the most common "greenbrier" in *Smilax* section China (all with 2n = 32). Though ranging from dry and damp sites, *rotundifolia* is especially common in understories of subxeric woods, and rare to absent on richer soils.

Descriptions differ and variation deserves further study (e.g. D, F, SC, Y, FNA 26).

Peduncles of *rotundifolia* are generally short, more or less equalling petioles, unlike other greenbriers in the state, but this character alone can be unreliable. Umbels tend to have relatively few flowers (usually 4-10 versus 8-25 in other species). An acutely obvious character of *rotundifolia* in the field is that its stout greenish prickles are uniformly scattered along most internodes except flowering branches (versus decreasing in density above plant base); also most internodes are clearly 4-angled (versus terete or slightly angled). Its leaves dry to pale brownish-green with a raised network of veins; minute irregular projections are usually scattered along thin margins and on veins below, at least towards the base.

Two species of southeastern lowlands resemble *rotundifolia* in their relatively short peduncles: *S. walteri* Pursh (with red versus black berries, leaves smooth below and usually narrower, stems less angled, prickles subulate and concentrated at bases) and *S. laurifolia* L. (with unilocular ovaries, purplish berries, narrower more coriaceous evergreen leaves, and fewer distal prickles). Reports of those two species from Ky. have been erroneous (M), but *walteri* may be known from nc. and w. Tenn. (Wilbur 1967; Ch).

HAB 7,11,6,10 C 3. **ABU** g10 s10 -2.

2388--*Smilax bona-nox* L. var. *bona-nox*
Smilacaceae [Liliaceae]: *Smilax* <China> *bona-nox* var. b.
This southeastern vine occurs in a wide range of habitats (F, FNA 26, W), but in Ky. it is most common on dry calcareous sites. The northern limit of its range is relatively abrupt; it is restricted to southern regions within Ill. and Ind., and remains unknown in Ohio and W.Va. (PL). In Ky. there are virtually no records north of the Kentucky River Palisades, except for colls. from HARR and PEND (KY), plus sight records of B from CART and ROWA.

Compared to other greenbriers of Ky., *bona-nox* as a whole is distinct in its strictly 1-seeded berries (versus 1-3), though berries are similar to *hispida* in their relatively small size and less glaucous surface. Leaves have dilated (somewhat deltoid to hastate) bases, more gradual tapering to the apex (widest at 10-30% above base versus 30-50%); lower surfaces dry to a deep brownish ("tan") color with a raised network of veins; margins have pronounced pale thickening, with or without scattered spine-like projections; petioles are often

stellate-scurfy when young. Stems usually have blunt angles; the stout flattened prickles tend to be denser on basal internodes, which are often stellate-scurfy.

HAB 12,11,7,10 D 4. **ABU** g9 s9 -2.

2389--Smilax bona-nox L. var. hederifolia (Bey. ex Kunth) Fern.

Smilacaceae [Liliaceae]: *Smilax* <China> *bona-nox* var. *hederifolia*
Mapping here is provisional. This nebulous taxon might be largely determined by growing conditions (FNA 26, W), but it appears provocatively distinct in many cases (F, Gl). Var. *hederifolia* has a south-central range similar to typical *bona-nox*. But F described it as often climbing high in "rich or damp woods and wet thickets"; typical *bona-nox* occurs on "dry to moist sands of dunes, clearings, fields and thickets" or on calcareous soils. In Ky. *hederifolia* is recorded mostly from broader bottomlands in southern regions, and from rich calcareous soils of the Inner Bluegrass.

Var. *hederifolia* has broadly ovate-deltoid, subcordate leaves, at least on fertile branches, with little or no lobing (versus deltoid to panduriform with distinct lobes, often mottled with pale patches), and with spiny teeth fewer to absent along margins. These plants have often been misidentified as *rotundifolia* or as *hispida*; see notes under var. *bona-nox* for general characters of the species.

HAB 7,4,8 E 3. **ABU** g8 s8 -4.

2390--Smilax hispida Muhl. ex Torr.

Smilacaceae [Liliaceae]: *Smilax* <China> *hispida* (?*tamnoides* var. *h.*)
This is widespread in eastern North America, but uncommon to absent in regions with acid infertile soils, such the southern Cumberland Plateau. It has been combined with the strictly southern *S. tamnoides* L. in some recent treatments (FNA 26, W). *S. hispida* differs in its relatively thin large, "regularly ovate to elliptic or rounded" leaves with 5-7 main veins (versus narrowly to broadly ovate, some or all panduriform, with 3-5 veins). Variety status may be appropriate, with *tamnoides* included under *hispida* var. *australis* (Small) Coker, but there have been nomenclatural problems (Wilbur 2003).

Compared to other greenbriers of Ky., both *hispida* and *tamnoides* have terete stems, but often with fine ridges. Prickles on stems are concentrated along the basal meter or so, where they are dense, slender, with varied sizes,

and blackish. Leaves dry to "olive-gray" or blackish with contrasting pale veins; margins are thin with dense minute projections (ca. 2-4 per mm).

HAB 4,5,7 D 3. **ABU** g10 s10 -3.

2391--Smilax glauca Walt. var. glauca

Smilacaceae [Liliaceae]: *Smilax* <China> *glauca* var. *g.*
This is widespread across southeastern states, but largely restricted to acid soils.

Colls. mapped as open dots are not assigned to variety. Leaves of *glauca* are strongly whitened and often covered with short "hairs" below (or granular protruberances), often mottled with pale patches above, and entire margined.

Compared to other greenbriers of Ky., *S. glauca* has stems that are relatively slender (ca. 2-3 mm wide at base versus 3-5 mm), terete or slightly ridged, often glaucous when young and tend to blacken with age. Prickles are dense along lower internodes with varied sizes, but tend to be just stout, recurved and restricted to nodes in distal parts of plants. Rhizomes can become relatively large and deep.

HAB f-10,11,7 C 4. **ABU** g9 s9 -1?

2392--Smilax glauca Walt. var. leurophylla Blake

Smilacaceae [Liliaceae]: *Smilax* <China> *glauca* var. *leurophylla*
This relatively northern variety, with leaves glabrous beneath, may not deserve local recognition. There are no clear differences in distribution or habitat within Ky.

HAB f-10,11,7? C? 4? **ABU** g9 s9 -1?

2393--Lycoris radiata (L'Hér.) Herbert C

Amaryllidaceae <Lycorideae> [Liliaceae]: *Lycoris radiata*
This cultivated East Asian species ("red spider-lily" or "magic lily" etc.) is often persistent from old plantings and may rarely spread, especially in warmer regions of North America (PL). It may rarely escape in Ky. but no established populations have been documented (J).

ALI AS.

2394--Lycoris squamigera Maxim. C

Amaryllidaceae <Lycorideae> [Liliaceae]: *Lycoris squamigera*
This commonly cultivated East Asian species (the pink "resurrection lily") can often persist from plantings, but there are virtually no records of true

naturalization in North America (K, PL). There is a coll. from "forested slopes" near a public resort in CLIN (EKY).

ALI AS.

2395--*Leucojum aestivum* L. C

Amaryllidaceae <Narcisseae> [Liliaceae]: *Leucojum aestivum*

This cultivated species ("snowflake") can persist for decades at abandoned gardens with some local spread. It is not clear if there is true naturalization in Ky., with new establishment from seed, which is reported from northeastern states (F). There are records from FULT (MUR), GRAY (R. Seymour for KY), LYON (APSU), OLDH (DHL), TRIG (APSU) and probably elsewhere. *Leucojum* is a large relative of *Galanthus nivalis* L. ("snowdrop"), which is not known to persist or spread in Ky.

ALI EU.

2396--*Narcissus poeticus* L.

Amaryllidaceae <Narcisseae> [Liliaceae]: *Narcissus poeticus*

This is the commonly cultivated "narcissus" that is often persistent from old plantings in North America. In Ky. it is generally impossible to infer whether colls. are from plants established from seedlings. The colls. mapped as open dots in HENR (KY) and MASO (BEREA) are the hybrid with *N. tazetta* L. (= *X medioluteus* P. Mill., *N. biflorus* M.A. Curtis); they are probably from cultivated plants. The hybrid with *pseudonarcissus* (= *X incomparibilis* P. Mill.) has also been reported to persist in JEFF (M, FNA 26).

ALI EU. **HAB** R-10 D 3. **ABU** +5.

2397--*Narcissus pseudonarcissus* L.

Amaryllidaceae <Narcisseae> [Liliaceae]: *Narcissus pseudonarcissus*

This is the commonly cultivated "daffodil" that is often persistent from old plantings in North America. Although it can increase locally in Ky. to form populations of 100s or 1000s, there has been no definitive report of establishment from seedlings, and there is no evidence of long-distance dispersal.

ALI EU. **HAB** R-10 D 3. **ABU** +5.

2398--*Hymenocallis occidentalis* (LeConte) Kunth

Amaryllidaceae <Hymenocallideae> [Liliaceae]: *Hymenocallis occidentalis* ("caroliniana")

This southeastern species occurs mostly in the central and lower Mississippi Valley, extending only locally to Atlantic states. It usually occurs in thin

submesic woods on base-rich soils, usually on seasonally damp ledges or slight seeps, and often at edges or with some history of disturbance. The name *H. caroliniana* (L.) Herbert has been misapplied to this species, according to FNA 26 and W.

Hymenocallis and its relatives are remarkably showy plants, centered in tropical America. These include tetraploids at the base of their phylogeny: $2n = 46$, but $2n = 40$ in *occidentalis*. They are distant allies of cultivated Eurasian plants such as *Lycoris* ($2n = 22$ basally), *Leucojum* (22) and *Narcissus* (14).

HAB 7,11,6 D 3. **ABU** g8 s8 -3.

2399--*Allium tricoccum* Ait.

Amaryllidaceae <Allieae> [Liliaceae**]: *Allium tricoccum* (var. t.)

In Ky. this largely northeastern species is uncommon and largely restricted to mesic woods on steep base-rich slopes in Appalachian, Knobs and Bluegrass regions. It is close to *burdickii*, and some colls. need to be rechecked.

HAB 5 D 1. **ABU** g9 s8 -3.

2400--*Allium burdickii* (Hanes) A.G. Jones

Amaryllidaceae <Allieae> [Liliaceae**]: *Allium burdickii* (*tricoccum* var. b.)

This was neglected in Ky. until the 1980s, and it may be more widespread than records suggest. Although still treated as a variety by some authors (Cr, FNA 26), it generally seems distinct from *tricoccum* (Jones 1979; J). Intermediate plants have not been documented in Ky. The two species have similar northeastern ranges, but *burdickii* is locally predominant in midwestern regions, especially on drier base-rich soils. Both species seem to have significant disjunct occurrences in hilly regions of c. Ky. and c. Tenn. (Ch), but further checking of identifications is desirable across their ranges.

A. burdickii differs from typical *tricoccum* in its umbels, with fewer flowers (ca. 10-18 versus 30-55), on more erect, shorter pedicels (ca. 10-15 mm versus 15-25 mm), with shorter spathe bracts (ca. 1-2 cm versus 2-3 cm); its scapes are usually shorter (ca. 13-16 cm versus 25-35 cm); its leaves are usually narrower (ca. 2-4 cm versus 5-8 cm), without a distinct petiolar base, the base white (versus with a distinct reddish/pink petiole); its bulbs are usually narrower (ca. 1-1.5 cm versus 2-3 cm). It usually flowers with the leaves in Jun (versus after the leaves in Jul).

HAB 5,11 E 1. **ABU** g8 s7 -3.

2401--*Allium mutabile* Michx. R

Amaryllidaceae <Allieae> [Liliaceae**]: *Allium mutabile* (microscordion; canadense var. mobilense)

This southeastern diploid ($2n = 14$) is concentrated around the lower Mississippi Valley, and often known as *A. canadense* var. *mobile* (Regel) Owenby; see also Sm and W. It has been reported from relatively dry open habitats in s. Ill. and much of Mo. but remains unverified in Ind., Ky. and Tenn., where treatments have been inconsistent (FNA 26, PL, W, Ch+). It was reported from Ky. by BA, but apparently based on misidentified colls. of *ampeloprasum* (SIU).

In *mutabile* the inflorescences mostly contain just normal perfect flowers, but sometimes mixed with asexual plants, suggesting polymorphic populations. In typical *canadense* most or all of the inflorescences contain just asexual bulblets. Also, the flowers of *mutabile* tend to be slightly deeper pink on ascending pedicels (versus sinuous).

2402--*Allium canadense* L.

Amaryllidaceae <Allieae> [Liliaceae**]: *Allium canadense* (var. c.)
This is a variable species or species-complex of eastern North America. With its broad definition, $2n = 14, 21$ or 28 ; see also notes under *mutabile*. In Ky. typical *canadense* occurs mostly in thin woods on moist to damp base-rich soils, especially toe-slopes just above floodplains. But its distribution is patchy, and the species is uncommon to rare in some agricultural regions, perhaps due to past rooting of hogs for its edible bulbs.

HAB 7,4,10 D 2. **ABU** g10 s10 -3.

2403--*Allium cernuum* Roth

Amaryllidaceae <Allieae> [Liliaceae**]: *Allium cernuum* (oxyphyllum)
Broadly defined, this complex species is widespread on xeric base-rich sites in North America, with several regional or local segregates that can be recognized (SC, W; D. Ford-Werntz, pers. comm.). See also notes under *stellatum*, which may have been confused in some cases; $2n = 14$ in both species.

HAB 12,10 + E 5. **ABU** g9 s8 -2?

2404--*Allium stellatum* Nutt. ex Ker-Gawl. T

Amaryllidaceae <Allieae> [Liliaceae**]: *Allium stellatum*
This is a widespread North American species centered in the upper midwest, with outlying southeastern populations in c. Tenn., s. Ill., and perhaps s. Ind.

There are only dubious or unverified reports from Ky., where it has often been confused with *cernuum* (M); D. Estes (pers. comm.) has recently reported it from CRIT. An additional undescribed variant of *stellatum* is being revealed with deeper study in c. Tenn. (D. Estes, pers. comm.).

Compared to typical *cernuum* (F, W; D. Estes, pers. comm.), *stellatum* differs in its flowers, opening in Jul-Nov (versus Jun-Aug), stellate with spreading tepals (versus campanulate to almost rotate), and pink-magenta (versus white-pink); scapes are nodding in bud but become erect in late flower to fruit (versus still nodding in fruit); and bulbs are ovoid (versus more elongate).

2405--*Allium sativum* L.

Amaryllidaceae <Allieae> [Liliaceae**]: *Allium sativum*
In North America the commonly cultivated garlic may not be widely established independently of plantings; $2n = 16$ (FNA 26, K, W). In Ky. it is often impossible to infer if colls. are from persistent plantings, bulblets or truly spontaneous seedlings. However, plants have colonized several acres of young woods on gravelly lowlands at Bernheim Forest in BULL (A. Berry, pers. comm.).

ALI EU. **HAB** R-10 ::? C? 5. **ABU** +5.

2406--*Allium oleraceum* L. C

Amaryllidaceae <Allieae> [Liliaceae**]: *Allium oleraceum*
This is a wild uncultivated garlic of Europe that is rarely adventive in North America; $2n = 32, 40$ (K, FNA 26, PL). It has been reported from old fields and disturbed areas in HICK and JEFF (M), but colls. have not been confirmed.

ALI EU.

2407--*Allium ampeloprasum* L.

Amaryllidaceae <Allieae> [Liliaceae**]: *Allium ampeloprasum*
This variable weedy species ("wild leek") is widely scattered in southeastern states; $2n = 16-80$ (FNA 26, K, W). Probably all wild records from Ky. are for the typical var. *ampeloprasum*, with relatively small umbels superficially similar to *mutabile*. There is a likely cultivated coll. of var. *atroviolaceum* (Boiss.) Regel from JEFF (DHL).

ALI EU. **HAB** R-10 ::? D 5. **ABU** +4.

2408--*Allium vineale* L.

Amaryllidaceae <Allieae> [Liliaceae**]: *Allium vineale*
In Ky. this weed has been a serious problem for varied crops and forage since early settlement (Gm), as elsewhere in eastern states. Variation in the species deserves further study; $2n = 16, 32, 40$. Records mapped here include forma *capsuliferum* (as treated by F).

The closely related species, *A. cepa* L., is the diploid progenitor of cultivated shallots and onions, which are occasionally persistent in gardens but not truly naturalized. Also allied is *A. schoenoprasum* L., a complex circumboreal species including the cultivated chives, which do not persist in Ky.

ALI EU. **HAB** R-10,7,4 :: D 5. **ABU** +6.

2409--Nothoscordum bivalve (L.) Britt.

Amaryllidaceae <Allieae> [Liliaceae**]: *Nothoscordum* [*Allium*] *bivalve*
This diploid ($2n = 18$) occurs in thin woods and natural openings from southeastern states to South America. In Ky. it occurs mostly on base-rich soils, with moisture conditions generally intermediate between those of *Allium cernuum* and *A. canadense*.

HAB 12,11,10 D 4. **ABU** g9 s8 -3.

2410--Camassia scilloides (Raf.) Cory

Asparagaceae <Agavoideae> [Liliaceae**]: *Camassia scilloides* ("esculenta")
This largely midwestern species of base-rich soils usually occurs in open woods, fields and prairies (e.g. Yatskievych 1999). But within Ky. it is most common in fairly deep shade, often on steep rocky slopes. Occasional plants in more open disturbed areas (e.g. the "Julian Savanna" of FRAN and other old woodland pastures) may well be persistent remnants of more shady woods.

Camassia ($2n = 30$) is allied with Agavoideae ($2n = 60$ in general) rather than Scilloideae (AP). Its species were well known to native peoples in North America for their edible bulbs. Bulbs in *C. scilloides* are usually 15-30 cm deep, which may well reflect selection due to herbivory by mammals. But pigs probably dug out much during the early period of settlement, when there was extensive open range for livestock.

HAB 5,7 E 2? **ABU** g9 s8 -4.

2411--Yucca filamentosa L.

Asparagaceae <Agavoideae> [Liliaceae**]: *Yucca filamentosa* (var. fi.)

Typical *filamentosa* is native to the southeastern Coastal Plain (centered in Va. to Ala.), but it is also cultivated inland, and has become widely naturalized. There is no conclusive evidence that it was native in Ky. before settlement, though there were references to a potential common name for it, "beargrass." Short (1840) noted: "A showy and ornamental plant, frequent in garden; and which I am informed by the Rev. Mr. Jones, of Hopkinsville, grows abundantly on the Cumberland mountains, in the S.E. corner of Kentucky." However, early use of the name "beargrass" may have implied *Tripsacum dactyloides* (see notes under that name) or some other coarse grass (Short suggested *Echinochloa*). See also notes under *Y. flaccida*.
ALI s. **HAB** f-10,7,12 C 4. **ABU** +2?

2412--Yucca flaccida Haw. T

Asparagaceae <Agavoideae> [Liliaceae**]: *Yucca flaccida* (smalliana, *filamentosa* var. s.)

The native range of this taxon is centered on the Gulf Coastal Plain (especially Ga. to Miss.), but it has also been widely cultivated and naturalized, perhaps as far north as *filamentosa* (FNA 26; J, W). It has often been combined or confused with *filamentosa*, and may best be treated as a variety. Colls. generally need to be reexamined.

Y. flaccida differs from typical *filamentosa* in its smaller flowers (with tepals ca. 3-5 cm long versus 5-7 cm) and pubescent (versus glabrous) inflorescence branches. Also, its leaves tend to be narrower (ca. 1.5-4 cm versus 2-6 cm), thinner and more pliable, flat (versus concave upwards), and with the apex attenuate to a spinose point (versus acute to obtuse).

ALI s.

2413--Manfreda virginica (L.) Salisb. ex Rose

Asparagaceae <Agavoideae> [Liliaceae**]: *Manfreda* [*Agave*] *virginica*
In Ky. and Tenn. almost all records of this southeastern species are from calcareous sites, but to the south and west it also occurs on non-calcareous sites (Y, W). Leaves vary much in shape and coloration. Colls. from FLEM (KY-Agr.), LEWI (B), ROBE (B) and perhaps HARD (KY) are referable to var. *tigrina* Engelm. (as named within *Agave*), with purple-maculate leaves. That segregate was considered a distinct species by Sm, but it is not recognized at all in recent treatments.

HAB 12 + D 4. **ABU** g9 s9 -3.

2414--Hosta ventricosa (Salisb.) Stearn

Asparagaceae <Agavoideae> [Liliaceae**]: *Hosta ventricosa*
This widely cultivated octoploid (2n = 120) is rarely naturalized in North America. There are a few colls. from valleys of the Appalachian Cliff Section. These plants were far from obvious evidence of old home sites or gardens, and in some cases colonies appeared to be spreading in the woods (Poindexter & Thompson 2008).

ALI AS. HAB 6,7? D? 3. **ABU** +4.

2415--*Scilla siberica* Haw.

Asparagaceae <Scilloideae> [Liliaceae**]: *Scilla siberica*
This is the "Siberian squill" that is often planted in North America and sometimes increases with seedlings in or near gardens. There are naturalized populations in CAMP (J. Thieret, pers. comm. to M) and JEFF (P. Haragan, pers. comm.), but further documentation and monitoring is desirable.

ALI EU. HAB 7,5,11 D 1. **ABU** +4.

2416--*Hyacinthoides nonscripta* (L.) Chouard ex Rothm. C

Asparagaceae <Scilloideae> [Liliaceae**]: *Hyacinthoides* [*Scilla**] *nonscripta*
This is the "English bluebell" of western Europe, formerly treated in the genus *Endymion*. There are colls. from ESTI (EKY) and perhaps HICK (check MUR), apparently from naturalized plants but associated with old home sites and plantings. Generic placement of this species (2n = 16, 24) has been controversial; *Scilla* (sensu lato) is a large complex genus with several polyploid series.

ALI EU.

2417--*Ornithogalum umbellatum* L.

Asparagaceae <Scilloideae> [Liliaceae**]: *Ornithogalum umbellatum*
This "Star-of-Bethlehem" has become widely naturalized across eastern North America since early settlement. In 1914 Gm noted: "Common in old lawns about dwellings...It seems to have been much planted in former times as an ornamental and still clings to old premises when not wanted." Dispersal of bulbs may occur locally more often than seeds (Y). Like several other genera in Hyacinthaceae, *Ornithogalum* contains polyploid series based on 2n = 18, but chromosome number of *umbellatum* in North America remains undocumented (FNA 26, Y).

ALI EU. HAB r-7,4,10 :: D 3. **ABU** +6*.

2418--*Muscari botryoides* (L.) P. Mill.

Asparagaceae <Scilloideae> [Liliaceae**]: *Muscari botryoides*

This is the common "grape-hyacinth" of gardens, now locally naturalized in northeastern states and elsewhere. Some records here may come from persistent plantings rather than truly naturalized populations, but this species does appear to be the most widely escaped hyacinth in Ky.

ALI EU. HAB r-10 D 3. **ABU** +5.

2419--*Muscari neglectum* Guss. ex Ten.

Asparagaceae <Scilloideae> [Liliaceae**]: *Muscari neglectum* (racemosum)
This narrow-leaved grape-hyacinth has been cultivated in North America for over 100 years, and it is locally naturalized in southeastern states. The few colls. from Ky. were mostly made close to residential areas or old home sites.

ALI EU. HAB r-10 3. **ABU** +4.

2420--*Muscari comosum* (L.) P. Mill. C

Asparagaceae <Scilloideae> [Liliaceae**]: *Muscari comosum*
There is a coll. from TRIG (APSU), but it is not clear if this was persistent from an old planting or not.

ALI EU.

2421--*Hyacinthus orientalis* L. C

Asparagaceae <Scilloideae> [Liliaceae**]: *Hyacinthus orientalis*
This is the ancient cultivated hyacinth from western Europe. It is widely grown in North America and occasionally persistent but not truly naturalized. There are colls. from old home sites in JEFF (M), LYON and TRIG (APSU).

ALI EU.

2422--*Polygonatum pubescens* (Willd.) Pursh

Asparagaceae <Nolinoideae> [Liliaceae**]: *Polygonatum pubescens*
In Ky. this northeastern diploid (2n = 20) is largely restricted to woods on mesic slopes with base-rich soils. It is abruptly absent from the southwestern third of Ky. and the western half of Tenn. (Ch).

HAB 5 E 1. **ABU** g9 s9 -2.

2423--*Polygonatum biflorum* (Walt.) Ell.

Asparagaceae <Nolinoideae> [Liliaceae**]: *Polygonatum biflorum* (var. b.)
This is widespread in mesic to slightly xeric woods of eastern North America. Broadly defined, it is a variable species, but see notes under *commutatum*.

HAB 5,11,7 C 2. **ABU** g10 s10 -2.

2424--*Polygonatum commutatum* (J.A. & J.H. Schultes) A. Dietr.

Asparagaceae <Nolinoideae> [Liliaceae**]: *Polygonatum commutatum* ("canaliculatum", biflorum* var. commutatum)

This tetraploid (2n = 40) is concentrated in midwestern regions and occurs on relatively mesic fertile sites, more often on floodplains than typical diploid biflorum; it is the only *Polygonatum* known in Mo. (Y). Despite several general differences (F, W), this taxon may sometimes be indistinct from typical biflorum (Cr, FNA 26, W). Variety status has often been preferred, and further research is needed to clarify phylogeny and nomenclature (A. Floden, pers. comm.).

P. commutatum differs from typical biflorum in its greater average size, ca. 20-90 cm in height (versus usually 6-20 cm). Leaves are subpetiolar, clasping to sheathing at base (versus virtually sessile, not clasping), 3.5-13 cm wide (versus 1.2-6 cm), the larger ones with ca. 110-220 nerves (versus 50-120) and more corrugated. Peduncles have 2-10 flowers (versus 1-5); the perianth is typically 17-20 mm long (versus 7-15 mm), with 5-6.5 mm lobes (versus 3-4 mm).

HAB 7,10 D 3. **ABU** g9 s9 -3.

2425--*Smilacina stellata* (L.) Desf.

Asparagaceae <Nolinoideae> [Liliaceae**]: *Smilacina* [*Maianthemum**] *stellata*

This diploid (2n = 36) is widespread across northern states and adjacent Canada, in varied habitats. Within Ky. it is known only from three localities: (1) a cluster of sites in the northeastern Knobs (CART, LEWI, ROWA); (2) an 1830s coll. of C.W. Short from "Corn Island" near the Falls of Ohio Rv. (JEFF); and (3) a 1970s coll. from swampy woods near the Green Rv. (MCLE).

HAB 6,7,10 D 3. **ABU** g10 s2 -3?

2426--*Smilacina racemosa* (L.) Desf.

Asparagaceae <Nolinoideae> [Liliaceae**]: *Smilacina* [*Maianthemum**] *racemosa*

This is widespread in mesic woods of northern states and adjacent Canada, but extends further south into east-central states than *stellata*. Typical eastern plants are tetraploid (2n = 72). Mapped records here include the southeastern segregate, var. *cylindrata* Fern. (F), which has not been recognized in recent treatments (W).

HAB 5,7,11 D 2. **ABU** g10 s10 -3.

2427--*Maianthemum canadense* Desf.

Asparagaceae <Nolinoideae> [Liliaceae**]: *Maianthemum canadense*
This diploid occurs in cooler regions of northeastern states and adjacent Canada, usually in mesic woods on acid soils. In Ky. it is known only from the Cumberland Mts. and a few ravines in the Appalachian Cliff section. Merging of *Maianthemum* (with dimerous flowers) and *Smilacina* (with trimerous flowers) is favored by some authors (W).

HAB 5,4 B 1. **ABU** g9 s4 -1.

2428--*Convallaria majuscula* Greene

Asparagaceae <Nolinoideae> [Liliaceae**]: *Convallaria majuscula* ("montana"*, *majalis* var. *montana*)

Convallaria is a circumboreal genus with three closely related taxa; 2n = 38 (FNA 26, W). Although Cr suggested that *majuscula* is an indistinct plant derived from plantings of the European *C. majalis* L., its widely scattered distribution on southern Appalachian mountains is hard to explain in terms of just 200-300 years of dispersal from cultivation. Moreover, these plants appear more closely related to the Asian *C. keiskei* Miquel than to *majalis*. In Ky. *majuscula* is known only from a few sites on Cumberland Mt. near the border with Va.

HAB 5 B 1. **ABU** g8 s3 =.

2429--*Convallaria majalis* L. C

Asparagaceae <Nolinoideae> [Liliaceae**]: *Convallaria majalis*
Although widely grown in Ky. since early settlement, and sometimes escaping near gardens (Gm), this "Lily of the Valley" has not spread significantly over the landscape and there is no evidence of seedlings. There are colls. from FAYE and MADY (EKY), probably from persistent plantings.

ALI EU.

2430--*Asparagus officinalis* L.

Asparagaceae <Asparagoideae> [Liliaceae]: *Asparagus officinalis*
This commonly cultivated rhizomatous vegetable (asparagus) often persists in abandoned gardens and it appears to have spread by seed in many areas.

ALI EU. **HAB** H-10 D 5. **ABU** +5.

2431--*Hemerocallis fulva* (L.) L.

Hemerocallidaceae [Liliaceae]: *Hemerocallis fulva*

This commonly cultivated "day-lily" was first recorded from Ky. as an escape in the 1930s (B). It is often impossible to distinguish persistent plantings of

this popular species from spontaneously established plants. Included here are records from GALL and MARS (KY) of the double-flowered var. kwanso Regel.

In addition, the yellow *H. lilioasphodelus* L. is collected from OLDH (DHL), but perhaps only persistent after cultivation. Various cultivars and hybrids involving these taxa are also commonly grown, often persistent, and perhaps spontaneously dispersed.

ALI AS. HAB f-10,8,7 D 4. **ABU** +6.

2432--*Iris cristata* Ait.

Iridaceae: *Iris* <*Lophiris*> *cristata*

This occurs mostly in hilly regions of east-central states, especially on sandy soils in or around the Appalachians and Ozarks. However it is virtually absent in the Bluegrass region and in lowlands of the lower Ohio and central Mississippi Valleys. In the central Bluegrass, Short (1828-9) noted: "...found on the rocky or gravelly margins of the larger water-courses. Kentucky river." Variation in *Iris cristata* is evident at the molecular level (Hannan & Orick 2000), but deserves further study in relation to morphology and habitat; $2n = 24$ and 32 (FNA 26, Y).

HAB 5,11,4 C 2. **ABU** g9 s9 -2.

2433--*Iris verna* L. var. *smalliana* Fern. ex M.E. Edwards

Iridaceae: *Iris* <*Vernae*> *verna** var. *smalliana*

This largely southern Appalachian taxon is also disjunct in the Ouachita Mts. (FNA 26, W). It occurs in or near the Cliff Section of the Appalachian Plateaus, but with its range curiously interrupted between Lee Co., Ky., and Scott Co., Tenn. Typical *verna* is more southern and unknown in Ky., with virtually no overlap in range; but $2n = 42$ in both according to FNA 26.

HAB 11,12 B 3. **ABU** g7 s7 -2?

2434--*Iris prismatica* Pursh ex Ker-Gawl. R

Iridaceae: *Iris* <*Prismatica*> *prismatica*

This southern Appalachian and east-coastal species has been reported from Ky. by RAB and FNA 26, but no coll. has been seen. Plants known as var. *austrina* Fern. occur in the oak barrens of southern Tenn.

2435--*Iris fulva* Ker-Gawl.

Iridaceae: *Iris* <*Hexagonae*> *fulva*

This occurs mostly in thin swampy riparian woods on the Gulf Coastal Plain, especially along the lower Mississippi and its major tributaries (K). In Ky. it is documented from only a few sites along the Mississippi Rv. Colls. from CARL (especially) and HICK (at MUR) are atypical and may be introgressed with *brevicaulis*; $2n = 42$ in both species (FNA 26).

HAB 6 D 3. **ABU** g6 s3 -3?

2436--*Iris brevicaulis* Raf.

Iridaceae: *Iris* <*Hexagonae*> *brevicaulis*

In Ky. this southeastern species is restricted to thin mesic to subhydric woods and edges on terraces of rivers in western regions, but it is locally common (M). It is close to *I. hexagona* Walt., which is known only from S.C. and Fla. (FNA 26). A coll. of *hexagona* by R. Peter (PH) has been attributed to Ky., but there are no locality data, and it may have come from interstate exchange (M).

HAB 6,4,7? C 4. **ABU** g7 s6 -3.

2437--*Iris pseudacorus* L.

Iridaceae: *Iris* <*Laevigatae*> *pseudacorus*

This yellow iris is often planted in semi-natural vegetation of eastern North America, and it tends to spread from rhizomes. In Ky. there is no evidence of any independent spread from seed. Without flowers, *pseudacorus* is almost indistinguishable from *virginica* (*sensu lato*), but hybrids are unknown; $2n = 24-34$.

ALI EU. HAB 2,1 ~ D 5. **ABU** +5.

2438--*Iris shrevei* Small

Iridaceae: *Iris* <*Laevigatae*> *shrevei* (*virginica** var. *s.*)

This is centered largely in the central and upper Mississippi Valley, the Ohio Valley and the southern Great Lakes region (F, Cr). Typical *virginica* is more southern, largely on the Coastal Plain and unknown in Ky., with virtually no overlap in range. Although treated as a variety of *virginica* in most manuals (or combined in FNA 26), *shrevei* has consistently larger capsules (7-11 cm long versus 4-7 cm), darker flowers, taller, more branched and persistent habit (remaining upright after flowering). Chromosome numbers need to be checked; reportedly $2n = 70-72$ in *virginica*, but *sensu lato* with variety unknown.

HAB 6,4,2 C 3. **ABU** g9 s8 -3.

2439--*Iris versicolor* L. T

Iridaceae: *Iris* <*Laevigatae*> *versicolor*

Two Ky. colls. have been tentatively assigned to this northeastern species: made in BELL (KY) and POWE (MICH). *I. versicolor* is considered to be an allopolyploid ($2n = 108$) derived from *I. shrevei* Small and the more Arctic northeastern taxon, *I. hookeri* Penny (= *I. setosa* var. *canadensis*; Cr, FNA 26). Further investigation is needed.

2440--*Iris germanica* L.

Iridaceae: *Iris* <*Iris*> *germanica*

This is the common garden iris, with many cultivars; $2n = 36-48$, In Ky. several colls. (including OLDH and ROBE) are probably from persistent plantings rather than true naturalizations.

ALI EU. **HAB** 2 ~ C 5. **ABU** +5.

2441--*Belamcanda chinensis* (L.) DC.

Iridaceae: *Belamcanda* [*Iris*] *chinensis*

This "blackberry-lily" was widely planted in Ky. as an ornamental early after settlement (Short & Peter 1835; Gm). It has persisted or spread into many sites, including thin woods and open land, especially on rocky ground.

[Compare also notes of Gm on *Saponaria officinalis*.]

ALI AS. **HAB** f-12,10 D 4. **ABU** +5.

2442--*Gladiolus communis* L. C

Iridaceae: *Gladiolus communis* (*byzantinus*)

In North America this showy Mediterranean species is often cultivated but rarely persists. In Ky. there are a few records of persistent plants but no clear evidence of naturalization. A coll. from GRAV (R. Athey #2310; check EKY) is identified as *G. byzantinus* P. Mill., which has been combined with *communis* or treated as a subspecies. Cultivars may be derived from hybrids involving several different taxa.

ALI EU. **HAB** H-10 D? 4. **ABU** +4.

2443--*Gladiolus italicus* P. Mill. C

Iridaceae: *Gladiolus italicus* (*segetum*)

This close relative of *communis* is widely cultivated in North America but perhaps not truly naturalized. Two Ky. colls. suggest occasional persistence in abandoned gardens: from EDMO (M. Medley #18975-88 for WKY) has been identified as *G. italicus* P. Mill.; and a coll. from GRAV (R. Athey #2181; check EKY) as *G. segetum* Ker-Gawl. The latter has been combined with *italicus* in recent treatments (FNA 26).

ALI EU. **HAB** H-10 D? 4. **ABU** +4.

2444--*Crocus vernus* (L.) Hill C

Iridaceae: *Crocus vernus*

This Mediterranean species is commonly planted in gardens of Ky., and it often persists for decades in mowed areas, but there are no records that indicate spread into wilder vegetation (J, M).

ALI EU.

2445--*Sisyrinchium atlanticum* Bickn.

Iridaceae: *Sisyrinchium atlanticum* (*mucronatum* var. a., "bermudiana")

This is widespread across eastern states, especially on sandy soils of coastal regions, but it is uncommon to absent in much of the Ohio Valley and midwest (K). *S. atlanticum* is often confused with *angustifolium*, but differs in its less robust habit, more glaucous and less blackening when dried; $2n = 16$ or 32 versus 96 (FNA 26, W). With older treatments, some colls. have been incorrectly named as *S. bermudiana* auct. non L.

HAB f-10,12 ::? B 5. **ABU** g9 s8 -3.

2446--*Sisyrinchium angustifolium* P. Mill.

Iridaceae: *Sisyrinchium angustifolium* (*graminoides*)

This variable polyploid is widespread in eastern states, except much of the upper midwest; segregates are not generally recognized (F, Cr, FNA 26). A few colls. (e.g. from FLOY at KY) are hard to distinguish from *atlanticum*; see notes under that name.

HAB F-10,8 ::? D 5. **ABU** g10 s10 -1?

2447--*Sisyrinchium mucronatum* Michx. R

Iridaceae: *Sisyrinchium mucronatum* (var. m.)

Typical *mucronatum* occurs mostly to the north and east of Ky., perhaps including some bordering counties of Va. (FNA 26; F, PL, W). There are no confirmed records from the state, but there has been confusion with *atlanticum* and further review is needed. These are both slender plants (stems ca. 1-2 mm wide) with relatively small capsules, but *mucronatum* differs in its unbranched stems that dry dull greenish (versus branched, drying mostly straw-colored except for the blackish fruit); $2n = 32$.

2448--*Sisyrinchium albidum* Raf.

Iridaceae: *Sisyrinchium albidum*

This variable species is widespread across eastern states but most common in midwestern regions; $2n = 32$ and 64 . In Ky. *albidum* is virtually restricted to xeric calcareous sites, but to the south and west it does occur locally on more acid soils (FNA 26, W, Y). Flowers in Ky. are generally white, but some colls. have violet flowers: including from ADAI, FAYE, JESS, LEWI and MORG. **HAB** 12,10 + D 5. **ABU** g9 s8 -2.

2449--*Hypoxis hirsuta* (L.) Coville

Hypoxidaceae (Liliaceae): *Hypoxis hirsuta*

This is widespread in dry thin woods and glades of eastern North America. In Ky. it is generally absent from calcareous soils. Though previously treated in Amaryllidaceae (F) or Liliaceae (Cr) by some authors, *Hypoxis* and its allies are probably closer to Orchidaceae (APG, W and citations).

HAB 10,7,11 C 3. **ABU** g10 s9 -3.

2450--*Cypripedium reginae* Walt.

Orchidaceae <Cypripedieae>: *Cypripedium reginae* (?spectabile)

This northeastern species extends into southern Appalachian and Ozarkian regions, with recent records from all adjacent states (PL), but it is currently unknown within Ky. The coll. mapped here for WHIT (KY) was made by A.R. Crandall in the 1880s at "Corbin" and might be from an adjacent county. The record from EDMO is based on Hussey's (1876) listing of *C. spectabile* Sw., which was reported by other authors from Ky. during the 19th Century, but the synonymy is uncertain (M). Records from LEE (reported to Campbell et al. 1989) and PULA (D. Gooch, pers. comm.) are unverified sight records from the 1960s or 1970s. There are also 1830s colls. from Hamilton Co. in se. Ohio, close to Ky. (Braun 1967).

HAB 6? ::? D? 3? **ABU** g8 s1 -6?

2451--*Cypripedium kentuckiense* C.F. Reed

Orchidaceae <Cypripedieae>: *Cypripedium kentuckiense* (daultonii ined., ?furcatum of Raf.)

In addition to its main cluster of sites along the western edge of the Appalachian Plateaus in Ky. and n. Tenn, this species occurs in or near the Ouachita Mts. (Ark., Okla.) and at scattered localities on the Coastal Plain (Tex., La., Miss., Ala., Ga., Va.). There is a poor coll. from BALL (MUR) on the Coastal Plain in Ky. that was det. as "cf. *C. kentuckiense*" by J.T. Atwood. Several records of Reed (1981) have no known colls. Some populations may have been looted on occasion by horticultural collectors, e.g. along Triplett Creek in ROWA, and Negro Creek in WHIT. The virtual

absence of this species from the Red River watershed (MENI, POWE, WOLF) might reflect such looting.

C. kentuckiense is distinct from typical *pubescens* in its larger flowers (FNA 26), the lip 53-65 mm long (versus 35-54 mm), with a broader "cavernous" orifice 27-37 mm wide (versus 10-23 mm) and less forward projection as a "slipper", pale yellow or "ivory" (versus deep yellow), and usually appearing in mid- to late May (versus late April to early May). Hybridization is unknown except perhaps in Ark. ($2n = 20$ generally in the genus and several hybrids are known).

HAB 4,5,7 :: C 2. **ABU** g6 s4 -2.

2452--*Cypripedium pubescens* Willd.

Orchidaceae <Cypripedieae>: *Cypripedium pubescens* (parviflorum/calceolus var. pu.)

This is widespread in cool temperate regions of North America. Although it is widely recorded from wooded regions of Ky., numbers at each site are often small and many records are old. It seems likely that much digging of this showy species has occurred for short-term ornamental or herbal uses, as also noted by Gm. The only confirmed record from the Bluegrass region is a coll. by J.S. Foote in 1967 from FRAN (KY) on "flood plain of Elkhorn River opposite cliffs above Frankfort."

HAB 5,7 ::? C 2. **ABU** g9 s7 -4.

2453--*Cypripedium parviflorum* Salisb.

Orchidaceae <Cypripedieae>: *Cypripedium parviflorum* (parviflorum/calceolus var. pa.)

This largely Appalachian and Ozarkian taxon is close to *C. pubescens* (see notes under that name) and to *C. parviflorum* var. *makasin* (Farw.) Sheviak of northeastern fens. These taxa are often combined to various degrees (Cr, FNA 26, W), but typical *parviflorum* appears quite distinct in Ky. It grows here in somewhat mesic woods on well-drained acid soils, often at the upper edge of *Tsuga* groves. Several records are not verifiable but historically important, such as sight records of B. This species often occurs with single plants or small groups, which should not be collected.

C. parviflorum (sensu stricto) differs from *pubescens* in its smaller flowers, the lip 22-34 mm long (versus 35-54 in *pubescens*), with sepals and petals densely, minutely spotted dark reddish brown or "madder" (versus unmarked, spotted, striped or reticulate with same color but less uniformly dark).

HAB 5,11,7 ::? B 2. **ABU** g10 s2 -2.

2454--*Cypripedium candidum* Muhl. ex Willd.

Orchidaceae <Cypripedieae>: *Cypripedium candidum*

In Ky. this largely midwestern species is currently known from a few sites in the western and northeastern Knobs. It occurs on seasonally dry soils in calcareous glades, but usually low on hillsides with some seepage in spring. Further west, C.W. Short collected it in the 1830s from "wet barrens near Hopkinsville" (CHRI at PH, KY; see also Short 1840). At a relatively well-known site in HARD, there is clear evidence of introgression with *pubescens* (MM for WKU), and there has been continual digging of the whiter plants by orchid-addicts.

HAB 12,10 ::? D 4. **ABU** g7 s2 -4.

2455--*Cypripedium acaule* Ait.

Orchidaceae <Cypripedieae>: *Cypripedium acaule*

In Ky. this northeastern species of dry acid soils is virtually restricted to Appalachian regions. The outlying unverified record from CALD is based on a reliable communication of R. Athey (M). There is also an outlying record from Hickman Co. in w. Tenn. (Ch).

HAB 11,7 :: A 2. **ABU** g9 s8 -2.

2456--*Galearis spectabilis* (L.) Raf.

Orchidaceae <Orchideae>: *Galearis* [Orchis] *spectabilis*

This is widespread in most eastern states, but uncommon to rare in much of the lower Ohio Valley and absent on most of the southeastern Coastal Plain. Although virtually absent now in the Bluegrass region, it may have been more frequent here. In his notes on flora of the Lexington area (FAYE), Short (1828) stated: "Of this extensive genus [Orchis sensu lato], the present subject is the only species I have met with in this neighbourhood... A few years since this occurred frequently in moist rich woods; it has now, however, almost disappeared before cultivation and the ravages of cattle."

HAB 5 ::? C 2. **ABU** g9 s9 -3.

2457--*Coeloglossum viride* (L.) Hartman var. *virescens* (Muhl. ex Willd.) Luer

Orchidaceae <Orchideae>: *Coeloglossum* [Habenaria] *viride* var. *virescens* (bracteata)

The only Ky. record of this northern (circumboreal) taxon is a coll. attributed here to WHIT (KY); it was made by A.R. Crandall at "Corbin" in the 1880s,

but it could be from adjacent KNOX or LAUR. *C. viride* has often been combined with *Platanthera* into the genus *Habenaria*, but it forms a distinct widely distributed circumboreal complex; $2n = 40$ (versus 42 generally in *Platanthera*). *Dactylorhiza* may become the accepted generic name (W).

HAB 7,6? B? 3? **ABU** g10 s1 -6.

2458--*Platanthera clavellata* (Michx.) Luer

Orchidaceae <Orchideae>: *Platanthera* [Habenaria] *clavellata*

This is widespread in eastern North America but restricted to wet acid soil and usually associated with *Sphagnum*. *Gymnadeniopsis* may become the accepted genus (W).

HAB 6 C 3. **ABU** g10 s8 -3.

2459--*Platanthera flava* (L.) Lindl.

Orchidaceae <Orchideae>: *Platanthera* [Habenaria] *flava* (var. f.)

This is a widespread southeastern taxon of wet acid soils on broad terraces and streamheads, usually associated with freshly deposited clay along small ephemeral streams that often dry up in summer and fall. Some colls. may be difficult to distinguish from *herbiola*, and should be rechecked. Typical *flava* and *herbiola* appear to be the only *Platantheras* in eastern North America that spread clonally with "elongate fleshy tuberoids" (F; FNA 26).

HAB 6,9 C 3. **ABU** g9 s8 -3.

2460--*Platanthera herbiola* (R. Br. ex Ait. f.) new comb.

Orchidaceae <Orchideae>: *Platanthera* [Habenaria] *herbiola* (*flava* var. h.*)

This northeastern taxon is generally distinct from typical *flava*, but ranges overlap in the Ohio Valley and some colls. are hard to assign. In Ky. *herbiola* is largely Appalachian and occurs along small streams that flow most of the year. Species status has been proposed for *herbiola* by some authors (e.g. Short 1840, Sm, Homoya 1993), or entertained by some (e.g. FNA 26, W), but denied by others (e.g. Cr, Yatskievych 1999).

P. herbiola differs from typical *flava* in the lip, which is usually narrower, oblong and obtuse (versus broadly ovate to orbicular or quadrangular, often emarginate). Also, the spike is usually more congested, with at least the lower bracts much exceeding their subtended flowers (versus about equalling). There are 2-3 (5) full-sized leaves (versus usually 2), which tend to be darker green.

HAB 4,6,1 C 4. **ABU** g9 s8 -3.

2461--*Platanthera ciliaris* (L.) Lindl.

Orchidaceae <Orchideae>: *Platanthera* [*Habenaria*] *ciliaris*

This is widely scattered across eastern states, but largely restricted to seasonally wet acid soils in varied open habitats with native vegetation. The old disjunct western records from CHRI (Ettman & McAdoo 1979) and MCRA (BT) may be supported by colls., but these have not been located. Neither is there confirmation of Ettman & McAdoo's records from the Cumberland Mt. counties. However, Pr's record from EDMO is supported by her excellent painting of this species at MO, labeled "Chalybeate Springs, wet sand soil" on 29 Jul 1896; plus her coll. from the same locality, "sand swamp" on 17 Jul 1897.

Note that *Blephariglottis* may become the accepted genus for this and other *Platantheras* with tripartite or fringed lips (W).

HAB 9,6 B 4. **ABU** g9 s8 -3.

2462--*Platanthera cristata* (Michx.) Lindl.

Orchidaceae <Orchideae>: *Platanthera* [*Habenaria*] *cristata*

This southeastern species is restricted to seasonally wet, strongly acid soils, usually associated with *Spagnum* in sunny areas. In Ky. it occurs mostly on soils derived from the Corbin Sandstone of the southern Cumberland Plateau. An 1880s coll. attributed to WHIT (KY) is labelled just "Corbin" and could be from an adjacent county. However, this species was also discovered in WHIT during the 1990s.

HAB 9,6 A 4. **ABU** g8 s3 -3.

2463--*Platanthera integrilabia* (Correll) Luer

Orchidaceae <Orchideae>: *Platanthera* [*Habenaria*] *integrilabia* (*blephariglottis* var. i.)

This globally imperiled species is known only from low hills around the southern Appalachians, especially on the Cumberland Plateau. In Ky. it is restricted to damp sites on flatter uplands of the southern Cliff Section, especially on soils derived from the Corbin Sandstone. A 1949 coll. attributed to WHIT (KY, NCU) has only "bog, Cumberland Falls" as the locality, and it might have come from adjacent MCRE. However, this species was also discovered in WHIT (KY) a few miles northeast of Cumberland Falls during 1993 (Campbell et al. 1994).

In Ky. *integrilabia* is restricted to boggy, acid, infertile soils in streamheads of small (5-20 acre) watersheds with virtually no disruption by roads, farming

or similar disturbance. Declines have occurred at some sites in recent decades, apparently due to excessive competition from trees in areas recovering from logging (with dense shade and drying-out of soil). Also, head-cutting of streams threatens to drain some areas, especially after the unusually heavy rainfall of 1990-2010. Plants can prosper in open areas with occasional cutting, especially in rights-of-way under powerlines where most flowering occurs in early Aug (later than most others in the genus). But they can survive for decades in the shade without flowering. Plants are often identifiable locally by their leaves, which have a rather distinctive deep glossy green, narrow strap-like appearance.

HAB 6,9 A 3. **ABU** g4 s3 -2.

2464--*Platanthera peramoena* (Gray) Gray

Orchidaceae <Orchideae>: *Platanthera* [*Habenaria*] *peramoena*

This ranges from mid-Atlantic states to the Ozarks. In Ky. most records are from lowlands in thin swampy woods and associated openings with damp medium-acid soils. *P. peramoena* is virtually absent from the Bluegrass region and other areas with fertile soils that have been largely converted to agriculture.

HAB 6,9 C 4. **ABU** g8? s8 -4.

2465--*Platanthera psycodes* (L.) Lindl.

Orchidaceae <Orchideae>: *Platanthera* [*Habenaria*] *psycodes*

In Ky. this northeastern species is known for certain only at high elevation on Black Mt. (HARL). There are also sight records from MENI, POWE and WOLF by several people (Campbell et al. 1989; KSNPC), but these may have been based on unusual forms of *peramoena* with less fringing.

HAB 7,6 C 4. **ABU** g8 s2 -1.

2466--*Platanthera lacera* (Michx.) G. Don

Orchidaceae <Orchideae>: *Platanthera* [*Habenaria*] *lacera*

This is widely scattered in eastern North America except the southeastern Coastal Plain. In Ky. it usually occurs in varied open habitats on medium-acid clayey soils with some seasonal dampness but often drying severely in summer. It is the only *Platanthera* sometimes found in old fields with little native vegetation.

HAB 9,10 C 4. **ABU** g10 s7 -3.

2467--*Platanthera leucophaea* (Nutt.) Lindl. R

Orchidaceae <Orchideae>: *Platanthera* [*Habenaria*] *leucophaea*

This largely midwestern species of wet prairies was reported from Ky. by Britton (1901) and Small (1903), but no coll. has been located.

2468--*Spiranthes lucida* (H.H. Eat.) Ames

Orchidaceae <Cranichideae>: *Spiranthes lucida*

In Ky. this northeastern species is known mostly from calcareous rocky banks of medium-sized streams along the western margins of the Appalachian Plateaus. Optimal habitat appears to include low muddy cracks among boulders. It has also been found by R. Thompson on a limestone quarry floor in CLAR. *S. lucida* is the earliest flowering *Spiranthes* in the state, usually in May-Jun; $2n = 44$ (versus 30 in most others).

HAB 1,9? +: D 6. **ABU** g10 s3 -2.

2469--*Spiranthes vernalis* Engelm. & Gray

Orchidaceae <Cranichideae>: *Spiranthes vernalis*

This is widespread from southeastern states to Central America. In Ky. it is one of the commonest *Spiranthes*, often occurring in old fields on soils with moderate fertility across a range of moisture conditions. It usually flowers in Jun-Jul, before the *cernua* and *lacera* groups.

HAB f-10,9,12 C 5. **ABU** g9 s9 -4.

2470--*Spiranthes praecox* (Walt.) S. Wats. R

Orchidaceae <Cranichideae>: *Spiranthes praecox*

This southeastern species has been reported from Ky. by Pr and others, but no confirmed colls. have been located (M). Colls. have been labelled as *praecox* from CALL and CARL (MUR), but these are probably *vernal*. *S. praecox* is close to *vernal*, and hybrids (= *X meridionalis* P.M. Brown) are known from further south (FNA 26); these hybrids were confused by F with *S. laciniata* (Sm) Ames. Both *praecox* and *laciniata* are largely restricted to the Coastal Plain (W).

2471--*Spiranthes odorata* (Nutt.) Lindl.

Orchidaceae <Cranichideae>: *Spiranthes odorata* (*cernua* var. o.)

This remarkable stoloniferous species is largely restricted to the Coastal Plain, except for disjunct records from Tenn. and Ky. (FNA 26). There is a small persistent population in WOOD (KY; Meijer 1976b). Cranfill's (1980) report from the Blood River seeps in CALL, together with *Lycopodiella appressa*, remains dubious; see also notes under *cernua*. See also note under *cernua*.

HAB 9,6 :: E 4. **ABU** g8 s2 -4.

2472--*Spiranthes cernua* (L.) L.C. Rich.

Orchidaceae <Cranichideae>: *Spiranthes cernua* (var. c.)

This is widespread in eastern North America but largely restricted to seasonally wet acid soils. It is a "facultatively agamospermic polyploid [$2n = 45, 60$] compilospecies in which unidirectional gene flow from related diploids generates a wide range of novel forms and races" (C.J. Sheviak & P.M. Brown in FNA 26); other *Spiranthes* in Ky. are mostly diploid ($2n = 30$). The coll. from BELL (KY) is very robust and somewhat similar to *odorata*. Records of Ettman & McAdoo (1979) were based on herbarium colls. but need to be confirmed; they include a cluster in the Bluegrass region, where *odorata* has also been found.

HAB 9,6 B 4. **ABU** g10 s8 -3.

2473--*Spiranthes ochroleuca* (Rydb.) Rydb.

Orchidaceae <Cranichideae>: *Spiranthes ochroleuca* (*cernua* var. o.)

This northeastern and Appalachian species of relatively dry sites is close to *cernua* but generally distinct (FNA 26). It should be searched for further in the field and herbarium.

HAB 10,8,7,12 C 6? **ABU** g9? s6? -3.

2474--*Spiranthes magnicamporum* Sheviak

Orchidaceae <Cranichideae>: *Spiranthes magnicamporum*

This is widespread across the Great Plains, and scattered thinly at disjunct sites in east-central states. The only known sizeable population in Ky., with 10-100 plants, is at "Pine Creek Barrens" (BULL). Most records are from groups of 1-10 plants, from which colls. have not generally yet been accessed; see KSNPC for details.

HAB 12,10 + D 6. **ABU** g8 s2 -5.

2475--*Spiranthes ovalis* Lindl. var. *erostellata* Catling

Orchidaceae <Cranichideae>: *Spiranthes ovalis* var. *erostellata* (?montana)

This is widespread across southeastern states, while typical *ovalis* is restricted to the Gulf Coastal Plain, with little overlap in range. It could be considered a distinct species (perhaps = *S. montana* Raf.). Var. *erostellata* is the only member of the genus to lack a well-developed rostellum and viscidulum, structures in the flower that oppose self-pollination (Catling 1983; FNA 26). Also, it has shorter sepals (ca. 3.5-5 mm versus 4-6.1 mm); flowers appear earlier but do not fully open, and the ovaries are simultaneously (versus progressively) swollen on each flower.

HAB 7,5,6 :: C 3. **ABU** g9 s8 -3.

2476--*Spiranthes lacera* (Raf.) Raf. var. *gracilis* (Bigelow) Luer

Orchidaceae <Cranichideae>: *Spiranthes lacera* var. *gracilis*

See notes under var. *lacera*.

HAB f-10,8 ::? C 4? **ABU** g9 s9? -3?

2477--*Spiranthes lacera* (Raf.) Raf. var. *lacera*

Orchidaceae <Cranichideae>: *Spiranthes lacera* var. l.

S. lacera is widespread in eastern North America. Var. *lacera* has a more northern range but overlaps greatly with var. *gracilis* and may intergrade (Cr, FNA 26); some authors do not consider these taxa distinct (Y). The spike of var. *lacera* is less spiraled, more pubescent, and produced while leaves are still evident; see also F. Var. *lacera* appears much less frequent than var. *gracilis* in Ky., and largely restricted to Appalachian regions. However, further checking of colls. is needed; also the reported earlier flowering of var. *lacera* deserves assessment in the state.

HAB F-10 ::? C 6? **ABU** g9 s7? -3?

2478--*Spiranthes tuberosa* Raf.

Orchidaceae <Cranichideae>: *Spiranthes tuberosa* (grayi)

This is widely scattered in southeastern states but largely restricted to dry acid soils.

HAB 7,10,11 B 4. **ABU** g8 s8 -3?

2479--*Goodyera pubescens* (Willd.) R. Br. ex Ait. f.

Orchidaceae <Cranichideae>: *Goodyera pubescens*

This is widespread in eastern North America except on the Gulf Coastal Plain, usually growing in dry woods on acid soils. In Ky. it is one of the commonest orchids, but rare to absent in most of the Bluegrass region and in more agricultural plains of western regions.

HAB 7,11,5 :: B 3. **ABU** g9 s9 -2.

2480--*Goodyera repens* (L.) R. Br. ex Ait. f.

Orchidaceae <Cranichideae>: *Goodyera repens*

This widespread northern (circumboreal) species extends south at higher elevation on or near the Blue Ridge, and even in Va. it is unknown in counties adjacent to Ky. [Appalachian plants are referable var. *ophioides* Fern. but that eastern segregate was not recognized in FNA 26.] The only record from Ky. is a recent discovery by J. Kiser in MCRE (EKY) near Yahoo Falls. Other

records seem to have been based on misidentified pubescens, including a previous coll. from near Yahoo Falls by E.M. & E.T. Browne (EKY).

See W for detailed key: *repens* differs from *pubescens* in its second to loosely spiraled spikes (versus dense cylindric), and its leaves darker green with pale green variegations (versus more distinct white variegations); 2n = 30 (versus 26).

HAB 5 ::? A 2. **ABU** g10 s2 -2?

2481--*Pogonia ophioglossoides* (L.) Ker-Gawl.

Orchidaceae <Pogoniinae>: *Pogonia ophioglossoides*

This species of boggy sites ranges widely over eastern North America, but most records are from the Coastal Plains and in the Great Lakes area. Inland, it occurs only locally in Appalachian and Ozarkian regions. Currently in Ky., the only known plants are along a dirt road on Pine Mt. in LETC (MM for WKY).

The coll. attributed to ROWA (PH) was made in 1834 by Clarendon Peck from "Licking River marshes." That historic record is supported by the extraordinary colored map of Oct 1834: "A Pictor of Peck's Travels on Licking." The map was discovered by A. Risk among the materials of C.W. Short in the Southern Historical coll. at Duke University. It shows "*Pogonia* & *Drosera*" in "marshes" on "High Flat Land" near the current Rowan County airport (Campbell et al. 1992).

HAB 9,6 :: A 4. **ABU** g9 s2 -5?

2482--*Cleistesiosis bifaria* (Fern.) Pansarrin & F. Barros

Orchidaceae <Pogoniinae>: *Cleistesiosis* [*Pogonia*] (*Cleistes**) *bifaria* (*divaricata* var. b.)

This southern Appalachian species is distinct from *C. divaricata* on the Coastal Plain; see also W for review of rationale for generic assignment. In Ky. most records come from the southern Cliff Section, especially on dry acid soils in powerline rights-of-way. But populations are generally thin, with only 1-10 plants usually found at each locality.

HAB 10,7 :: B 4. **ABU** g8 s7 -4.

2483--*Isotria verticillata* Raf.

Orchidaceae <Pogoniinae>: *Isotria* [*Pogonia*] *verticillata*

This ranges widely over eastern states but it is restricted to woods on dry acid soils. In Ky. populations are usually thin despite an ability to spread with

running roots (Y). The largely Appalachian *I. medeoloides* (Pursh) Raf., is known from adjacent counties of Ohio and Va. (K, PL). That species is globally rare but may be expected in Ky. on cooler or more mesic sites than verticillata, especially with *Pinus strobus* (W).

HAB 11,7 B 2. **ABU** g9 s8 -2.

2484--*Triphora trianthophora* (Sw.) Rydb.

Orchidaceae <Triphoreae>: *Triphora trianthophora*

This mysterious mycotrophic species is widespread in the eastern U.S.A. but rarely seen. It occurs in mesic forests (broadly defined), but mostly on rotted logs, along paths, near wetland margins, or in other interruptions of the ground vegetation, "usually developing only at remote periods" (F). Flowering appears generally sporadic from year to year, but plants sometimes appear in mass about two days after large drops in temperature during July and August (Dister 2005). In Ky. most records come from Appalachian regions, especially in recent decades. The coll. from FAYE (NY) was dated Jul 1833, by Robert Peter: "in grassy thin woods near Lexington."

HAB 7,5,6 :: C? 2. **ABU** g10 s7 -3?

2485--*Calopogon tuberosus* (L.) B.S.P.

Orchidaceae <Arethuseae>: *Calopogon tuberosus* (pulchellus)

This ranges widely across eastern North America but is restricted to seasonally damp strongly acid soils. In Ky. it has been found at scattered sites in eastern and central regions, but the only records after 1980 are from MCRE, PULA and WHIT. The record from WHIT (not LAUR as reported by Libby et al., 1997) is a photograph (GH), since the population was so small. *C. tuberosus* has a widespread eastern range, except in the lower Mississippi Valley.

D. Goldman has recently described *C. oklahomensis* from widely scattered sites, mostly in the Mississippi River watershed (FNA 26). This new species is known from c. Tenn. and n. Ill., and might have occurred in w. Ky. It differs in the near simultaneous opening of its flowers (versus sequential); the distal portion of middle lip is usually much narrower than long (versus usually much wider than long), triangular to broadly rounded (versus typically anvil-shaped); the stigma is typically flat against column surface (versus at angle); corms are elongate and forked (versus globose to elongate, not forked), and they may be able to survive unfavorable conditions for longer periods (D. Goldman, pers. comm.).

HAB 9,6 :: A 5. **ABU** g10 s2 -6.

2486--*Bletilla striata* (Thunb.) Reichenb. f. R

Orchidaceae <Arethuseae>: *Bletilla striata* (hyacintha)

This Chinese species is rarely established in North America (K, W). An apparently spontaneous plant was discovered in a garden of JEFF during the 1980s by R. Williamson; a photograph is in files of M.

ALI AS.

2487--*Listera smallii* Wieg.

Orchidaceae <Neottieae>: *Listera smallii*

This is restricted to central and southern Appalachian regions, usually on damp acid soils with *Rhododendron maximum*. The coll. attributed to HARL (MM for WKY) was made close to, and possibly within, the BELL county line.

HAB 6,7,8 A 1. **ABU** g8 s3 -1.

2488--*Listera australis* Lindl.

Orchidaceae <Neottieae>: *Listera australis*

This occurs on similar sites to *smallii*, mostly on the southeastern Coastal Plain but also extending up Atlantic states to eastern Canada. The only Ky. record is a 1970s coll. from near Murphy's Pond in HICK (Webb 1987).

HAB 6,7,8 A 1. **ABU** g8 s2 -2?

2489--*Epipactis helleborine* (L.) Crantz

Orchidaceae <Neottieae>: *Epipactis helleborine*

This is becoming common in northeastern states and adjacent Canada (FNA 26, W). In Ky. it is known from a few sites in woods on toe-slopes and floodplains, and it may be increasing along or near the Ohio Rv. (M; Brandenburg & Thieret 2003).

ALI EU. **HAB** 4,7? :: D? 3? **ABU** +4.

2490--*Malaxis unifolia* Michx.

Orchidaceae <Malaxideae>: *Malaxis unifolia*

This small orchid is widely scattered from Atlantic and southeastern states to Central America. In Ky. it is largely restricted to Appalachian regions or adjacent hills. There are a few dozen records from the state, but none indicate populations of more than 1-10 plants.

HAB 7,6,5 B 2. **ABU** g8 s7 -3?

2491--*Liparis loeselii* (L.) L.C. Rich.

Orchidaceae <Malaxideae>: *Liparis loeselii*

This circumboreal species is widespread in northeastern states and adjacent Canada, usually on wet sites of varied type. In Ky. it is known only from a few sites in Appalachian regions or nearby, usually on old mines, quarry-floors and roadcuts. All records were made after 1970; the species may well be adventive.

ALI n. **HAB** f-9,6 :: D 4. **ABU** g10 s5 +1?

2492--*Liparis liliifolia* (L.) L.C. Rich. ex Ker-Gawl.

Orchidaceae <Malaxideae>: *Liparis liliifolia*

This is widespread in eastern states, except on the southeastern Coastal Plain. It has declined greatly in some northeastern states (especially N.Y. to Va.), apparently due to browsing by dense deer populations (D. Goldman pers. comm.). Such decline has not yet been noted in Ky., where it is still locally frequent, especially in submesic woods on medium-acid soils.

HAB 5,7,11 :: C 3. **ABU** g9 s9 -2.

2493--*Hexalectris spicata* (Walt.) Barnh.

Orchidaceae <Epidendreae>: *Hexalectris spicata*

This mycotrophic species is widely scattered from southeastern states to Mexico, but it generally occurs in low numbers. In Ky. it may be most frequent in thin subxeric woods and edges on moderately base-rich soils, including limestone gravel roads on sandy uplands. Most records from Ky. have been made before 1950, including those assembled by Ettman & McAdoo (1978). Although there is a cluster of records from the southern Bluegrass and adjacent Knobs, this species is virtually unknown in that region today.

HAB 11,7,10 ::? D? 3. **ABU** g9 s7 -4.

2494--*Tipularia discolor* (Pursh) Nutt.

Orchidaceae <Calypsoeae>: *Tipularia discolor*

This "crane-fly" orchid is widely scattered across southeastern and Atlantic states except those adjacent to Canada, usually in submesic to subxeric woods on medium-acid soils. Flowers are produced in Jun-Aug and resemble crane-flies; leaves are produced during Oct-Dec, usually about the time that sand-hill cranes fly over. It is one of the most common orchids in Ky. and may be increasing in east-central states (Y).

HAB 7,5,11 C 1. **ABU** g9 s9 -2.

2495--*Aplectrum hyemale* (Muhl. ex Willd.) Torr.

Orchidaceae <Calypsoeae>: *Aplectrum hyemale*

This is widespread in north-central states and adjacent Canada east of the Rockies. Although there are many records from Ky., the species generally occurs in patches of just 1-10 plants. *A. hyemale* may be most common in moderately base-rich fertile soil in mesic woods, but it is rare or absent in most of the Bluegrass region and other landscapes with a long history of agricultural disturbance.

HAB 5,11,7 D? 2. **ABU** g9 s9 -2.

2496--*Corallorhiza wisteriana* Conrad

Orchidaceae <Maxillarieae>: *Corallorhiza wisteriana*

This mycotrophic species is widely scattered in North America, except for most northern states and Canada, and south to Central America. Habitats are similar to *odontorhiza*, and the primary ecological difference is flowering time: usually in Apr-May versus Aug-Oct. Note: the genus has sometimes been spelled *Corallorrhiza*, but that is incorrect (FNA 26).

HAB 5,7,6? C 1. **ABU** g9 s8 -2.

2497--*Corallorhiza odontorhiza* (Willd.) Poir.

Orchidaceae <Maxillarieae>: *Corallorhiza odontorhiza* (var. o.)

This is widely scattered in eastern North America and Central America. Northern plants are mostly cleistogamous. Chasmogamous plants have been named var. *pringlei* (Greenman) Freudenstein; they occur locally in northeastern states, but are so far unknown in Ky. (FNA 26).

HAB 5,7,11? C 1. **ABU** g9 s8 -2.

2498--*Corallorhiza maculata* (Raf.) Raf.

Orchidaceae <Maxillarieae>: *Corallorhiza maculata* (var. m.)

The only clear record of this widespread northern species is due to discovery by the dear, departed Mary Rogers around an old camp-fire near Pine Mt. Settlement School in HARL (EKY). It has also been found within half a mile of the Ky. state line in Scott Co., Tenn. (JC coll. at KY). There is a coll. of C.W. Short (MO dated 1840 that might be from Ky., but with no confirming data. BA's report from LOGA was based on a misidentified immature *Hexalectris spicata* (EKY).

HAB 5,7 C 1. **ABU** g10 s2 -2?

2499--*Thalia dealbata* Fraser ex Roscoe R

Marantaceae: *Thalia dealbata*

This species of southeastern swamps is known from se. Mo., and it might occur in Ky. as temporary or outlying waifs. There have been unverified reports from FULT by M. Medley and by R. Athey (M), but colls. have not been located.

HAB 2,6,9 D?

2500--*Canna ×generalis* Bailey (pro sp.) C

Cannaceae: *Canna generalis*

This has been collected from along a railroad in PIKE (M), but it is not clear if this commonly cultivated species is able to become truly naturalized in Ky.

ALI SA.

2501--*Eichhornia crassipes* (Mart.) Solms

Pontederiaceae: *Eichhornia crassipes*

This floating aquatic weed has spread from tropical regions to warmer regions of southeastern states. There are a few colls. from western regions of Ky., but the plants probably cannot persist and spread unless winters become milder (W).

ALI SA. **HAB** 2,1 ~ D 6. **ABU** +4.

2502--*Pontederia cordata* L.

Pontederiaceae: *Pontederia cordata* (var. c.)

This is widespread from eastern North America to South America (K, PL), with concentrations on the Gulf and Atlantic Coastal Plains, Great Lakes region, and along its western margins in the Mississippi Flyway for migrating birds. It is rarely recorded in Ky., and more details are needed. The plants found in GRNP (KNK) to the northeast were assumed to be escaped from cultivation.

HAB 2 ~ C? 5. **ABU** g9 s4 -3.

2503--*Heteranthera reniformis* Ruiz & Pavón

Pontederiaceae: *Heteranthera reniformis*

This southeastern aquatic is most common on lowlands draining into the Gulf of Mexico, and in mid-Atlantic coastal regions (K). It usually occurs along muddy shorelines of stagnant waters

HAB 2 ~ D 6. **ABU** g10 s8 -3.

2504--*Heteranthera limosa* (Sw.) Willd.

Pontederiaceae: *Heteranthera limosa*

This occurs mostly in the southern Great Plains and lower Mississippi Valley (K). In Ky. it occurs mostly in old sink-hole ponds and sloughs. Some records should be rechecked for *rotundifolia*, which can be confused.

HAB 2,9 ~ D 6. **ABU** g10 s5 -4.

2505--*Heteranthera rotundifolia* (Kunth) Griseb.

Pontederiaceae: *Heteranthera rotundifolia*

This species is close to *limosa*, with similar habitat and range, but mostly in ponds of the central Great Plains and absent in the lower Mississippi Valley. The only verified record currently is a coll. from "Hodgenville" in LARU (NY) by F.T. McFarland (#43); see also FNA 22.

HAB 2 ~ D? 6. **ABU** g10 s1 -5?

2506--*Heteranthera dubia* (Jacq.) MacM.

Pontederiaceae: *Heteranthera* <*Zosterella*> *dubia*

This narrow-leaved aquatic is widespread in most humid temperate regions of North and Central America, but it is rare to absent in more southeastern states. In Ky. it occurs in various kinds of streams, but becomes more common close to the Ohio Rv. and its major tributaries.

HAB 2,1 ~ D 6. **ABU** g10 s6 -4.

2507--*Tradescantia virginiana* L.

Commelinaceae: *Tradescantia virginiana*

In Ky. this species of east-central states is most frequent in thin oak-hickory forests, especially on moderately base-rich soils of gentle slopes above calcareous ravines. Some colls. from FAYE, HARD, MUHL and elsewhere are relatively hairy. Although these plants may not warrant separate status, it is important to compare them further with similar southeastern species. It is possible that such plants approach *T. hirsuticaulis* Small, which is a rather indistinct entity that is reported from Tenn., close to Ky. (Ch, K, W).

Cultivated plants or garden escapes referred to *virginiana* are excluded here. Cultivars appear to be largely derived from hybrids with *ohiensis*, and are sometimes named "andersoniana" (Tucker 1989; FNA 22). *T. subaspera* also appears to be involved in their parentage (R. Faden, pers. comm.). Hybrids are often reported in the genus, which has rather uniform chromosome numbers; $2n =$ both 12 and 24 within most species of eastern North America

HAB 11,7,8 D 2. **ABU** g9 s9 -2.

2508--*Tradescantia ohiensis* Raf.

Commelinaceae: *Tradescantia ohiensis* (canaliculata, reflexa)

This is widely distributed across eastern North America, but it is rare to absent in many regions, including the central Ohio Valley. In Ky. it occurs mostly in thin woods and scoured edges along larger streams, especially on sandy soils. It can hybridize with other species; see notes under virginiana.

HAB 1,4,8,9? C 4. **ABU** g10 s7 -3.

2509--*Tradescantia bracteata* Small ex Britt. R

Commelinaceae: *Tradescantia bracteata*

This midwestern species is similar to virginiana, but clearly differs in its glandular inflorescence. It is known from a few sites in s. Ill. and s. Ind. (K, PL), but there are only vague reports from Ky. It was listed for Ky. by BA (check MEM or EKY), and more tentatively by M from BULL (based on a coll. at Oklahoma State Univ.).

2510--*Tradescantia subaspera* Ker-Gawl. var. *subaspera*

Commelinaceae: *Tradescantia subaspera* var. s.

This species is widespread across east-central states, but typical plants occur mostly west of the Appalachians in thin woods on mesic to subxeric calcareous slopes. It flowers distinctly later than ohiensis and virginiana, mostly in Jun-Aug (versus Apr-Jun).

HAB 5,11 D 1. **ABU** g9 s9 -3.

2511--*Tradescantia subaspera* Ker-Gawl. var. *montana* (Shuttlw. ex Britt.) E.S. Anderson & Woods.

Commelinaceae: *Tradescantia subaspera* var. montanum (T. comata)

This largely Appalachian taxon is somewhat distinct and deserves further study (F), though doubted by most recent authors (FNA 22, W). It is typically shorter, with stems less flexuous, leaves less broadened above the sheath, longer upper internodes and upper lateral peduncles. In Ky. it is known only from low slopes along the Cumberland Rv. and its major tributaries, in thin woods just above scoured open shrubby zones (Palmer-Ball et al. 1988).

HAB 5,4 C 1. **ABU** g7? s5? -1.

2512--*Tradescantia zebrina* Hort ex Bosse C

Commelinaceae: *Tradescantia* (*Zebrina*) *zebrina* (*Z. pendula*)

This tropical species from Central America is often cultivated as a house-plant. It can sometimes establish temporarily from escaped or discarded plantings, but it is not truly naturalized in North America. There are colls. from BARR (DHL) and LYON (APSU).

There is also a dubious record from Ky. of the similar sprawling Asian species, *Tradescantia fluminensis* Vell. (M; Campbell et al. 1992). In North America, that species is well-established only in warmer parts of the Gulf Coastal Plain and Fla. (K, SE).

ALI AS.

2513--*Murdannia keisak* (Hassk.) Hand.-Maz.

Commelinaceae: *Murdannia* (*Aneilema*) *keisak*

This weedy species is widespread in warmer regions of southeastern states, mostly from Va. to Ga. (K, SE, W).

ALI AS. **HAB** f-9,2,1 :: B? 4. **ABU** +4.

2514--*Commelina diffusa* Burm. f.

Commelinaceae: *Commelina diffusa*

This weedy variable annual (2n = 36-90) is widely scattered on damp fertile soils in southeastern states. In Ky. there has been some confusion in appearance with *C. communis* (especially var. *ludens*). Also, there has been some confusion in nomenclature with *C. nudiflora* L. (M), which is an old synonym of *Murdannia nudiflora* (L.) Brenan.

ALI AS. **HAB** f-9,6 :: D 4? **ABU** +5.

2515--*Commelina communis* L.

Commelinaceae: *Commelina communis*

This variable annual (2n = 28-90) is widespread in eastern states on moist to damp fertile soils, often weedy in gardens and among buildings. Colls. from BELL, CARL, HARD (KY, MUR) and probably elsewhere are referable to var. *ludens* (Miq.) C.B. Clarke. That variety is not recognized in most recent treatments, but see Tucker (1989).

ALI AS. **HAB** F-10,9,8 :: D 4. **ABU** +6.

2516--*Commelina virginica* L.

Commelinaceae: *Commelina virginica*

This is a widespread southeastern species of damp floodplain woods. It is the most robust *Commelina* in eastern North America, with distinctive rhizomes; 2n = 60.

HAB 6,9,4 D 3. **ABU** g9 s9 -3.

2517--*Commelina erecta* L. var. *erecta*

Commelinaceae: *Commelina erecta* var. *erecta* (*elegans*)

This variable perennial (2n = 56-120) ranges from eastern states south to tropical regions of Central America and West Africa. It occurs in a wide range of open habitats, from riverbanks to rock outcrops, usually on well-drained sandy or gravelly soils. Most colls. need to be rechecked for var. *angustifolia* (see notes under that name).

HAB f-12,11,10 :: C 4? **ABU** g9 s6? -3.

2518--*Commelina erecta* L. var. *angustifolia* (Michx.) Fern.

Commelinaceae: *Commelina erecta* var. *angustifolia*

This is southeastern but perhaps most common in Tex., and it may be typical of drier sites in general (Brashier 1966; FNA 22, W). The two varieties of *erecta* are generally separable in Ky., but further checking and assessment is needed.

HAB f-12,10,1? :: C? 4? **ABU** g9 s6? -3.

2519--*Typha latifolia* L.

Typhaceae: *Typha latifolia*

This is a nearly cosmopolitan species of stagnant pond margins and marshes.

HAB 2 D 5. **ABU** g10 s10 +1?

2520--*Typha X glauca* Godr. (pro sp.)

Typhaceae: *Typha angustifolia* x *latifolia* (*X glauca*)

This has increased in North America along with *angustifolia*, and it has been considered an incipient species by several authors (F, RAB, W). In Ky. these apparent hybrids are locally abundant and deserve to be mapped, but most colls. need further checking; see FNA 22 for detailed key. There could also be confusion with *domingensis*, if this is present; see notes under that name.

ALI n. **HAB** 2 D 5. **ABU** g10 s8? +1?

2521--*Typha angustifolia* L.

Typhaceae: *Typha angustifolia* (var. a.)

This is now about as widespread as *latifolia* in eastern North America, but it may have spread after colonization from coastal regions or even Eurasia (FNA 22). It is considered more tolerant of alkaline or saline conditions, and it has increased inland during the past 50-100 years, especially along winter-salted interstates. It was first documented in Ky. during the 1930s (B).

ALI n. **HAB** 2 D 5. **ABU** g10 s9? +1?

2522--*Typha domingensis* Pers. R

Typhaceae: *Typha domingensis* (*angustifolia* var. *virginica*)

This southern (pantropical) species has been reported from the Ky. (J), but details are not available. It was recently found in w. Tenn. (Stewart Co.) about 10 miles from CHRI (D. Estes, pers. comm.). Hybrids can be expected with congeners; 2n = 30 (as in most/all Typhaceae sensu lato).

ALI s.

2523--*Sparganium eurycarpum* Engelm. ex Gray

Sparganiaceae [Typhaceae]: *Sparganium eurycarpum* (*erectum* ssp. *stoloniferum*)

This is widespread in northern and western states and adjacent Canada. In Ky. it is known only from marshy shorelines and sloughs along the Ohio Rv. (at Meldahl Dam in BRAC) or nearby (Little Cypress Slough in HEND).

HAB 2 E? 5. **ABU** g10 s3? -3.

2524--*Sparganium americanum* Nutt.

Sparganiaceae [Typhaceae]: *Sparganium americanum*

In Ky. this widespread variable eastern species (W) is the most common *Sparganium* but not generally abundant. It tends to occur in less stagnant water than *Typha*, often partially submerged in sluggish streams draining wetlands.

HAB 2,1 D? 5. **ABU** g10 s8 -2.

2525--*Sparganium androcladum* (Engelm.) Morong

Sparganiaceae [Typhaceae]: *Sparganium androcladum*

This ranges widely over northeastern states, but it is most common along the coast of New England and along the midwestern Mississippi Flyway of migrating birds.

HAB 2 C? 5. **ABU** g9 s7 -3.

2526--*Sparganium emersum* Rehm R

Sparganiaceae [Typhaceae]: *Sparganium emersum* (*chlorocarpum*, "*angustifolium*")

This is a widespread northern species of boggy shores that has been known as *S. chlorocarpum* Rydb. (especially var. *acaule* (Beeby) Fern. to the south) or erroneously merged with the circumboreal *S. angustifolium* Michx. The few records of these taxa from Ky. (e.g. BA) are at least partly based on misidentified *americanum* (e.g. colls. of R. Athey at EKY) but deserve further checking. *S. emersum* is known from adjacent counties in s. Ill., s. Ind. and w. Va. (K, PL, W).

2527--*Juncus tenuis* Willd.

Juncaceae: *Juncus* <*Steirochloa*> *tenuis* (var. t.; macer)

This widespread North American species is close to *anthelatus*, *interior*, *dichotomus*, *secundus* and other taxa; there are frequent difficulties in identification and some indications of hybridization. But R.E. Brooks (FNA 22) valiently maintained these all as species, in contrast to Cr.

J. tenuis and *anthelatus* are distinguished from others of this group in Ky. by their longer whitish membraceous auricles (ca. 1-4+ mm versus < 1 mm), but no other clearly defined differences are known. There may still be much variation to explore within *tenuis*; reportedly $2n = 30-84$ versus just 80 in most others (or often 84 in *dudleyi*). Diversity of inflorescence branching patterns, in particular, deserves deeper analysis for potential diagnostic use.

HAB f-7,11,10 ::: D 3? **ABU** g10 s10 +2?

2528--*Juncus anthelatus* (Wieg.) R.E. Brooks

Juncaceae: *Juncus* <*Steirochloa*> *anthelatus* (*tenuis* var. a.)

This occurs in east-central states, mostly from the central Mississippi Valley to the Great Lakes region. Although known previously as just a variety or form of *tenuis*, these plants have been recently promoted to species status by R.E. Brooks (FNA 22). Differences in ecology are not clear; *anthelatus* may be concentrated on more open sites with more seasonal wetness (see also Y; W. Knapp, pers. comm.). Closer study of material filed under *tenuis* is desirable to check on taxonomy and distribution.

J. anthelatus differs in having capsules widely spaced along the usually diffuse branches of the inflorescence (versus congested along internodes about as long as perianth), and usually < 3/4 length of perianth (versus 3/4 or more). Also plants are generally 7-9 dm tall (versus < 7 dm).

HAB f-10,9? ::: C? 6. **ABU** g8? s8? -1?

2529--*Juncus dudleyi* Wieg.

Juncaceae: *Juncus* <*Steirochloa*> *dudleyi* (*tenuis* var. d., *uniflorus*)

This is widespread in seasonally wet base-rich soils across temperate regions of North America, but virtually absent on the southeastern Coastal Plain, where it is replaced by the closely related species, *dichotomus*. It is less tolerant of frequent disturbance than *tenuis*, but often occurs along scoured rocky banks of streams and rivers.

Compared to others in the *tenuis* group, *dudleyi* is diagnosed by its short glossy yellowish-brown leathery auricles (versus pale papery), relatively blunt bracteoles, perianth ca. 4-6 mm (less in most other taxa), and longer anthers (ca. 0.6-1 mm versus 0.4-0.6 mm).

HAB f-9,6,2 :: D 4? **ABU** g10 s8? -2.

2530--*Juncus interior* Wieg.

Juncaceae: *Juncus* <*Steirochloa*> *interior* (*tenuis* var. "*uniflorus*")

Mapping here is provisional. Although combined with *tenuis* by some authors (Cr), *interior* it is still generally recognized as a separate taxon. It is widespread in prairies from the Great Plains to Mo., Ill. and Ind., but uncommon to rare in most of the Ohio Valley, where it is often confused with related species. Compared to *tenuis*, *interior* grows in more dry and open habitats on varied types of soil. *J. interior* has been mapped in Ky. by FNA 22, and R. Naczi has identified colls. from marshy shorelines and depressions in lowlands of BOYD, CAMP and GRNP. Colls. of R. Athey from BALL, FULT, GRAV and MCRA need to be rechecked (presumably at MEM).

Compared to other species of the *tenuis* group, *interior* generally lacks distinctive characters (F; Braun 1967; FNA 22; Y). It appears to differ from *tenuis* only in its shorter auricles (ca. 0.5-1 mm versus 1-4 mm), acute-acuminate bracteoles (versus blunt-acute), and its more open inflorescences (sometimes suggesting *anthelatus* or *secundus*).

ALI w. **HAB** 9,6? :: D? 6. **ABU** g9 s5? -1?

2531--*Juncus dichotomus* Ell.

Juncaceae: *Juncus* <*Steirochloa*> *dichotomus* (*tenuis* var. d.; *J. platyphyllus*)

Mapping here is provisional. This species occurs mostly on acidic soils of the Atlantic and Gulf Coastal Plains. It was reported from Ky. in FNA 22, but details are not available. Colls. mapped here may be transitional to *interior* or *tenuis*; they are mostly from artificial lake shores, strip-mines and construction sites.

J. dichotomus is close to *interior* (see below) but differs in its usually deeper brown capsules (with "reddish", "castaneous" or "shining mahogany" tint), leaves almost terete to slightly channeled (versus flat), and sheaths deeper brownish or the inner ones often purplish (F, Cr, FNA 22, Y). Primary bracts are sometimes relatively short in both taxa (as in *secundus*), but this character is inconsistently reported.

Plants of Ohio and Ky. match those initially described as *J. dichotomus* var. *platyphyllus* Wieg., which has been considered a distinct species of eastern regions, inland to the Appalachian Plateaus (F, Braun 1967). That taxon tends to have more flattened leaves, longer auricles, paler sheaths and paler capsules, suggesting a transition to *tenuis*.

ALI s. **HAB** 2.6.9? :: C? 6. **ABU** g9 s8? +1?

2532--*Juncus secundus* Beauv. ex Poir.

Juncaceae: *Juncus* <*Steirochloa*> *secundus*

Mapping here is provisional. This species occurs mostly on seasonally dry infertile soils from the central Mississippi Valley to Appalachian and northeastern regions. It is often misidentified as *tenuis* or other species, and further study of colls. from Ky. is needed. Some records mapped here may be transferable to interior.

Distinctive features of *secundus*, compared to others of the *tenuis* group in Ky., are as follows (F, Cr, FNA 22, Y): capsules subglobose, 3-locular or nearly (versus usually more united); perianth usually 2.5-3.5 mm long (versus 3-6 mm); inflorescence with flowers secund along incurving branches (versus not so), often longer than primary bract (versus usually shorter or inconsistent); leaves usually < 1/3 height of plant (versus usually 1/3 to 1/2).

J. brachyphyllus Wieg. (= *J. kansanus* F.J. Herm.) is a western relative of *secundus* with larger perianth and less secund branches that has been suggested in w. Ky. (J) and w. Tenn. (W), but details of records are unknown. Its nearest well-known populations are in sw. Mo and nw. Ark. (FNA 22).

HAB f-10,12 :: C 6. **ABU** g9 s8 -1?

2533--*Juncus coriaceus* Mackenzie

Juncaceae: *Juncus* <*Steirochloa*> *coriaceus*

This occurs across southeastern states (except Mo.), but does not extend into the Ohio Valley north of the Cumberland and Green River watersheds. Although somewhat uncommon in Ky. it is locally abundant on medium-acid soils in open seeps, plus associated thin woodland and ditches in rights-of-way.

HAB 9,6 C 4. **ABU** g10 s7 -3.

2534--*Juncus gerardii* Loisel. W

Juncaceae: *Juncus* <*Steirochloa*> *gerardii*

This circumboreal species of northeastern salt marshes has spread inland to disturbed areas at scattered sites, usually along railroads and major highways (FNA 22, Y). The only Ky. record is a 1978 coll. by P.C. Applegarth from an area treated for oil spill along a railroad in KENT (KNK). It has more distinctly elongated rhizomes than any other *Juncus* in Ky.

ALI n. **HAB** f-10,9? E 5. **ABU** g10 s2? +1?

2535--*Juncus bufonius* L.

Juncaceae: *Juncus* <*Tenageia*> *bufonius*

This is a highly variable near-cosmopolitan species, usually associated with small or shallow ephemeral pools, drawdown shores and similar sites. Taxonomic segregates have not yet been well defined; 2n = 26 to 120 (Cr, FNA 22). *J. bufonius* is the only strictly annual species of *Juncus* known in eastern North America. It is often confused with *tenuis* and allied species in Ky., thus relatively undercollected.

HAB f-9 ::: C? 6. **ABU** g10 s7? -3.

2536--*Juncus effusus* L. var. *solutus* Fern. & Wieg.

Juncaceae: *Juncus* <*Juncotypus*> *effusus* var. *solutus*

This widespread taxon of wet soils in eastern North America may be considered a distinct subspecies or species. Typical var. *effusus* is largely European, locally introduced to northern North America but unknown in Ky. A coll. from MCRA (MUR) is referable to var. *compactus* Hoppe, but that variety is not separated from var. *solutus* in recent treatments.

HAB f-9,6 C 5. **ABU** g10 s9 +2?

2537--*Juncus pylaei* Laharpe

Juncaceae: *Juncus* <*Juncotypus*> *pylpei* (*effusus** var. p.)

This northeastern taxon is close to *effusus*. Although recognized as a variety by some (F) and a species by others (Cr), *pylpei* was not distinguished at all in FNA 22, which is surprising given the fine divisions recognized in the *tenuis* group. It has been overlooked in Appalachian regions, where it is locally common in thin woods and boggy openings along streamheads, seeps and similar places with wet acid infertile soils. It is typically absent from old fields, where *effusus* var. *solutus* is often locally dominant in swales.

J. pylpei differs from *effusus* var. *solutus* (F, Cr) in its usually narrower culms (ca. 2-3 mm at summit versus 3-4 mm), with fewer (ca. 10-20 versus 30-60), distinctly coarser ridges, often smaller heads (usually 2-6 cm wide

versus 4-10 cm), and usually longer sepals (ca. 2.5-4 mm versus 2-3 mm), which exceed (versus equal) petals and capsule.

HAB 6 B 3. **ABU** g8 s7? -2.

2538--*Juncus marginatus* Rostk.

Juncaceae: *Juncus* <Graminifolii> *marginatus* (var. m.)

This ranges widely over eastern states, but it is largely restricted to wet acid soils.

Some records mapped here need closer examination for separation of the generally more robust species, biflorus.

J. longii Fern. is another southeastern species that may be expected. It differs from both *marginatus* and *biflorus* in its relatively long, slender rhizomes and stolons; it typically has intermediate stature between *marginatus* and *biflorus*. *J. longii* occurs mostly on the Coastal Plain, but also extends close to Ky. on the Cumberland Plateau in Tenn. (Ch).

HAB 9 :: B 6. **ABU** g10 s9 -1?

2539--*Juncus biflorus* Ell.

Juncaceae: *Juncus* <Graminifolii> *biflorus* (*marginatus* var. b.*)

Although often treated as a species (F, W), this relatively southern taxon may be weakly separated from the more widespread, less robust *marginatus*, and these are sometimes combined (e.g. FNA 22). Several colls. From Ky. appear intermediate and further analysis is required. W emphasizes the larger vegetative dimensions of *biflorus* (especially blade width mostly 3.1-4.5 mm versus 1.6-2.6 mm), but earlier treatments have emphasized number of glomerules and other characters of the inflorescence.

HAB 9,6 :: B 4. **ABU** g9 s9 -1?

2540--*Juncus filipendulus* Buckl.

Juncaceae: *Juncus* <Graminifolii> *filipendulus*

This occurs mostly on calcareous uplands either side of the lower Mississippi Valley, especially on the southern Interior Low Plateau and disjunct on the Edwards Plateau of c. Tex. The few Ky. records are from glades in south-central regions. Some colls. were initially misidentified as the western species, *J. longistylis* Torr. (M).

HAB 12,10 + D 5. **ABU** g9 s3 -2?

2541--*Juncus canadensis* J. Gay ex Laharpe

Juncaceae: *Juncus* <Ozophyllum-a> *canadensis* (var. c.)

This variable species is widely scattered across eastern North America, but strongly concentrated in Atlantic states and the Great Lakes region (F, K, PL). In Ky. it is largely restricted to wet acid soils on the southern Appalachian Plateau and on the Mississippi Embayment.

Also expected in Ky. is a related species, *J. brachycephalus* (Engelm.) Buchenau (= *J. canadensis* var. *brachycephalus* Engelm.); $2n = 80$ in both taxa (FNA 22). This may be particularly close to *subcaudatus* (see below), and a deeper review of colls. in the *canadensis* group is needed to check identifications. *J. brachycephalus* occurs mostly in northeastern states and adjacent Canada, but there are scattered records south to Ga., Ala. and Okl. (K, W). Unlike *canadensis*, it occurs mostly on calcareous soils.

HAB 9,6,2 B 4. **ABU** g10 s7 -3.

2542--*Juncus subcaudatus* (Engelm.) Coville & Blake

Juncaceae: *Juncus* <Ozophyllum-a> *subcaudatus* (*canadensis* var. s.)

In Ky. this largely northeastern and montane species appears to be rare, with virtually no recent verified records. It is close to the more widespread species, *canadensis*, and it can also be confused with *acuminatus* (FNA 22, W). There is a verified 1930s coll. of B from MONR (US). The colls. from BELL (TENN) and MCRE (KY) are somewhat immature, and deserve further examination. Records from CALL (perhaps at MUR) were probably based on *canadensis* (M).

HAB 9,6,2? B? 4? **ABU** g8 s3? -4.

2543--*Juncus acuminatus* Michx.

Juncaceae: *Juncus* <Ozophyllum-b> *acuminatus*

This is widespread on wet medium-acid soils in humid temperate regions of North America. In gross morphology, it is a strictly cespitose species (without rhizomes or tubers), generally moderate in its degree of inflorescence branching and head size.

J. acuminatus typically has semi-globose heads, which are unusual among Ky. species of *Juncus*, and similar only to *articulatus*. But F noted: "In members of this section [Ozophyllum] the inflorescence is often changed to masses of horn-like galls." Psyllid insects are often involved (Hodkinson & Bird 2000). In *acuminatus* such inflorescences are frequent and sometimes interpreted as "pseudo-viviparous." This phenomenon has not been noted much within floras, and deserves more research in this and other wetland species (e.g. Leck & Leck 2005).

HAB 9,2 ::: C 6. **ABU** g10 s9 -1?

2544--*Juncus torreyi* Coville

Juncaceae: *Juncus* <*Ozophyllum*-b> *torreyi*

This is widespread in seasonally wet grasslands across temperate North America, mostly on base-rich soils of midwestern regions, but it is much less frequent in Atlantic states. Plants vary much in overall robustness and number of heads per inflorescence. However, no taxonomic variants have been recognized in floras.

The more slender northern species, *J. nodosus* L., is closely related to *torreyi* and should be expected. It is known from within 100 miles of the state line in Ill., Ind., Ohio and W. Va. (K, PL). Both species produce slender tuberiferous rhizomes.

HAB 9 ::? D? 6? **ABU** g10 s8 -3.

2545--*Juncus brachycarpus* Engelm.

Juncaceae: *Juncus* <*Ozophyllum*-b> *brachycarpus*

This is widespread across southeastern states, but most common in the central and lower Mississippi Valley and rare in south Atlantic states (K, PL, W). It usually grows on damp medium-acid soils; see notes under *scirpoides*.

HAB 9 ::? C? 6. **ABU** g9 s9 -3.

2546--*Juncus scirpoides* Lam.

Juncaceae: *Juncus* <*Ozophyllum*-b> *scirpoides*

This southeastern species is uncommon to rare in the Ohio Valley, and restricted to infertile acid soils. It is close to *brachycarpus* and easily overlooked without mature capsules, which equal or exceed the perianth (versus half to 2/3 as long), with a prominent beak of valves that do not separate at dehiscence (versus abruptly mucronate, the valves separating). Both species produce short stout rhizomes.

HAB 9 ::? B 4. **ABU** g9 s7 -3.

2547--*Juncus validus* Coville

Juncaceae: *Juncus* <*Ozophyllum*-b> *validus* (*crassifolius*)

This southeastern species is most common on seasonally wet soils of the Gulf Coastal Plain. The only Ky. records are two recent colls. from a roadside near mines, and an old quarry. It is probably adventive in the state.

ALI s. **HAB** r-9,2 ::? D? 6? **ABU** g9 s3 -3?

2548--*Juncus debilis* Gray

Juncaceae: *Juncus* <*Ozophyllum*-c> *debilis*

In Ky. this southeastern species is largely restricted to Appalachian regions, usually growing on damp acid sandy soils.

HAB 9,2 ::: B 6. **ABU** g8 s7 -2?

2549--*Juncus diffusissimus* Buckl.

Juncaceae: *Juncus* <*Ozophyllum*-c> *diffusissimus*

This robust relative of *debilis* has a more widespread southeastern range, and in Ky. it is much more frequent, with less restriction to strongly acid soils.

HAB 9,2 ::: C 6. **ABU** g9 s9 -1?

2550--*Juncus nodatus* Coville

Juncaceae: *Juncus* <*Ozophyllum*-c> *nodatus*

This robust species occurs mostly on the Gulf Coastal Plain and up into the central Mississippi Valley, usually growing at the edge of ponds and sloughs with frequent flooding.

HAB 2,9 ::? D? 6? **ABU** g8 s8 -3.

2551--*Juncus elliottii* Chapman

Juncaceae: *Juncus* <*Ozophyllum*-c> *elliottii*

This southeastern species with distinctive tuberiferous roots occurs mostly on damp to wet acid soils of the Coastal Plain. The single Ky. record is based on a coll. from BALL that was confirmed by KSNPC in the 1970s (M): R. Athey #950, wet meadows and slough margins [?Ballard Wildlife Management Area]. This coll. may be at MEM and should be rechecked.

HAB 2,9? ::? B? 6? **ABU** g8 s2 -4.

2552--*Juncus articulatus* L.

Juncaceae: *Juncus* <*Ozophyllum*-c> *articulatus*

In Ky. this northeastern tetraploid ($2n = 80$) has been found at scattered sites on or near the northern Cliff Section of the Appalachian Plateaus. In addition to some more or less natural shorelines, its habitats include disturbed roadsides and ditches, sometimes associated with oil or gas extraction. It is easily confused with related species (especially *debilis*) and must often have been overlooked. Its capsules are distinctive when mature, exerted about a third longer than the perianth, and glossy chestnut- or purplish-brown (FNA 22). It is somewhat rhizomatous.

HAB 9 ::? C 6. **ABU** g10 s5 -1?

2553--Luzula acuminata Raf. var. carolinae (S. Wats.) Fern.

Juncaceae: *Luzula acuminata* var. *carolinae*

In Ky. this southeastern variety is restricted to Appalachian regions. It is generally distinct from the more northern var. *acuminata* (= *L. saltuensis* Fern.) and may merit species status (W). Although there are reports of var. *acuminata* from Ky. (Ebinger 1962, Cr, M, J), no verified colls. are known. Braun (1937) reported *L. saltuensis* from MCRE (check US), but later apparently combined this with all other records of *acuminata* (B).

HAB 5 B 2. **ABU** g8 s8 -2.

2554--Luzula echinata (Small) F.J. Herm.

Juncaceae: *Luzula echinata* (*campestris* var. *e.*)

This is widespread from southeastern to Atlantic states. Most colls. are referable to var. *mesochorea* F.J. Herm., but that taxon has not been recognized in recent treatments. Distinction from *L. multiflora* is difficult in some cases; see notes under that species.

HAB 11,7 C 3. **ABU** g9 s9 -2.

2555--Luzula bulbosa (Wood) Smyth & Smyth

Juncaceae: *Luzula bulbosa* (*campestris* var. *b.*)

This is close to *echinata*, with a broad southeastern range (FNA 22). It may be typical of more open habitats, in general (F, W). It has distinctive basal "bulblets" within small dense tufts of whitish, swollen leaf bases.

Inflorescence branches are mostly ascending (versus divergent up to 90 degrees); spikes are ovoid to cylindric (versus subglobose to broadly ovoid or conic); perianths are generally shorter (ca. 2-3 mm versus 2.8-4 mm), with more distinct shining chestnut-brown centers (versus greenish to pale or dark brown); anther lengths are only 1-2x filament lengths (versus at least 2x); seeds tend to be shorter (0.9-1.3 mm versus 1.2-1.6 mm) and ellipsoid (versus globose). In Ky. flowering stems are generally (0.5) 1-2 (2.5) dm tall while those of *echinata* are generally (1) 1.5-3 (4) dm tall.

HAB 11,8? C? 4? **ABU** g9 s5? -2.

2556--Luzula multiflora (Ehrh.) Lej.

Juncaceae: *Luzula multiflora* (*campestris* var. *m.*)

Mapping here is tentative; few records are confirmed. Distinction of this variable northern (circumboreal) species from the southern diploids ($2n = 12$), *echinata* and *bulbosa*, is difficult in some cases. Typical *multiflora* in eastern states is tetraploid ($2n = 24$) and some northern segregates are hexaploids.

These three species may appear to intergrade in Ky. (see also B), but closer examination may prove otherwise.

L. multiflora is similar to *bulbosa* in its inflorescences and perianths (though generally larger), but differs (FNA 22) in its generally longer seeds (1.1-1.7 mm versus 0.9-1.3), with a shorter appended caruncle (averaging 0.3-0.5 mm versus 0.5-0.7 mm). Like *echinata*, it lacks bulblets and distinctly whitish leaf bases; but typical plants (F) may form relatively dense tussocks and tall flowering stems (ca. 1.5-6.7 dm or more versus 1-4.5 dm or less in the other two species).

HAB 11,8? C? 4? **ABU** g9 s8 -2.

2557--Cladium mariscoides (Muhl.) Torr.

Cyperaceae <Schoeneae s.l.>: *Cladium mariscoides*

This robust sedge is widespread in swamps and marshes across eastern North America, but occurs mostly in coastal and lacustrine regions. It was recently collected by K. Feeman in the Hog Hollow area of BATH (MDKY; Clark et al. 2005). It has also been reported from Ky. by Small (1903), Gleason (1952) and others, presumably based on an old coll. (but none found at NY).

HAB 9,3,2 D? 4. **ABU** g9 s2 -3?

2558--Scleria oligantha Michx.

Cyperaceae <Schoeneae s.l.>: *Scleria oligantha*

This is widespread in thin woods and glades from Central America to southeastern states, on damp or dry sites. It is generally absent from calcareous soils in Ky.

In addition to the distinctive tubercles below its achenes, *oligantha* has lateral spikes on relatively long-arching, filiform, reddish peduncles, dilated toward the summit (FNA 23, W). Lateral peduncles of *triglomerata* (and *nitida*) tend to be more erect, though becoming pendulous in deep shade.

HAB 7,6,10,9? C 4? **ABU** g9 s8 -3.

2559--Scleria triglomerata Michx.

Cyperaceae <Schoeneae s.l.>: *Scleria triglomerata*

This is widespread in the Caribbean region and eastern states, growing in thin dry woods or grassy openings, usually on sandy or leached calcareous soils. See also notes under *nitida*. In Ky. *triglomerata* appears to be a somewhat conservative remnant of open woodland, and it occurs mostly in areas that may have had a long history of frequent fire. Indeed, *Scleria* in general is virtually

absent in the relatively unbroken woods on dry ridges within the more rugged Appalachian hills.

HAB 11,7,10? C 4. **ABU** g9 s8 -2.

2560--*Scleria nitida* Willd. T

Cyperaceae <Schoeneae s.l.>: *Scleria nitida*

This close relative of *triglomerata* occurs largely on the Atlantic Coastal Plain, typically growing on dry acid soils. It may deserve no more than varietal status, and has not been separated at all from *triglomerata* in some recent treatments (Cr, FNA 23). However, while admitting much "hybridization or incomplete hybridization" in the genus, R. LeBlond (in W) considered that *nitida* is a distinct species; see also F. Further examination of Ky. colls. is needed for mapping. There are colls. at GH from CALL, HARL and MADI that have been det. as *nitida* by authorities.

S. nitida reportedly differs from *triglomerata* in its frequently longer rhizomes; its leaves are yellowish-green (versus bluish green) and narrower on average (ca. 4-6 mm wide, versus 6-8 mm); its sheaths are usually purplish (versus bluish-green, except for the band at summit), and the ventral surface is pubescent, especially on the "membranous band" (F) at the summit (versus glabrous, or nearly so); and its achenes are longer (2.8-4 mm versus 2-3.3 mm).

HAB 11,7,12? B? 4? **ABU** g9 s8 -2?

2561--*Scleria ciliata* Michx.

Cyperaceae <Schoeneae s.l.>: *Scleria ciliata* (pauciflora var. *glabra*)

This ranges from Central America to southeastern states, where it occurs mostly in thin pine woods or savannas on damp sandy soils of the Coastal Plain. *S. ciliata* is close to the more widespread *pauciflora* and has often been confused, but it should not be combined (FNA 23). In addition to the six separate tubercles at the base (hypogynium) of its achenes (versus 3 more or less lobed tubercles in *pauciflora*), its achenes are usually longer (2-3.5 mm versus 1-2.5 mm), and leaves are often relatively wide (1-7 mm versus 1-2.5 mm). Colls. from MCRE (KY, MO, US) and TRIG (KNK) have been identified as *ciliata* with some certainty, but the others should be rechecked; see KSNPC for recent reports. *S. ciliata* was not mapped in Ky. by FNA 23; and it may be unknown across n. Tenn. (Ch).

HAB 9,8,1? B 5? **ABU** g8 s2 -5.

2562--*Scleria pauciflora* Muhl. ex Willd. var. *pauciflora*

Cyperaceae <Schoeneae s.l.>: *Scleria pauciflora*

This relatively short *Scleria* is widespread in the Caribbean region and most eastern states. In Ky. it occurs on slightly damp to seasonally xeric acid soils (including leached calcareous soils). It may be reasonable to treat *pauciflora* as a variety of *ciliata*; see also Cr. But more hairy plants have also been considered distinct, as var. *caroliniana* (Willd.) Wood, with a more northern range (FNA 23, W). Colls. of R. Athey from LIVI and MARS (NCU) are referable to var. *caroliniana*, and other colls. of the species need to be rechecked.

HAB 10,12,9 C 5. **ABU** g9 s8 -3.

2563--*Scleria muehlenbergii* Steud. R

Cyperaceae <Schoeneae s.l.>: *Scleria muehlenbergii* (*reticularis** var. *pubescens*)

This annual or short-lived perennial (?) ranges widely from Central America to southeastern states, growing on wet soils of varied type. FNA 23 does not map the species in Ky., but does for all adjacent states except W.Va. *S. reticularis* Michx. is a distinct species on the Coastal Plain, but closely related. There is a coll. of C.W. Short (PH) that was determined as *muehlenbergii* by N.L. Britton, but it is labeled Ky. with no other data and might have come from another state.

2564--*Rhynchospora macrostachya* Torr. ex Gray

Cyperaceae <Schoeneae s.l.>: *Rhynchospora macrostachya*

This robust annual or short-lived perennial occurs mostly in swamps of the southeastern Coastal Plain, but there are scattered interior records as far as s. Mich. The two Ky. records come from depressional wetlands on karst plains of the Mississippian Plateaus; both sites have diverse native flora with several conservative and rare species.

HAB 2,9 C 5. **ABU** g9 s2 -4.

2565--*Rhynchospora corniculata* (Lam.) Gray

Cyperaceae <Schoeneae s.l.>: *Rhynchospora corniculata*

This robust perennial is widespread in swampy woods and marshes of southeastern states. Most plants in Ky., but not all, are probably referable to var. *interior* Fern. (F). However, that taxon is not generally distinguished in recent treatments (FNA 23).

HAB 9,6,3,2 C 4. **ABU** g9 s8 -3.

2566--*Rhynchospora glomerata* (L.) Vahl

Cyperaceae <Schoeneae s.l.>: *Rhynchospora glomerata*

This is close to *capitellata*, and has a more southern range, being most common on the Coastal Plain. Intergradation is known in southern regions (FNA 23), and suspected in Ky. *R. glomerata* usually has distinct achenes (FNA 23, J, LeBlond in W): averaging larger, up to 1.4 mm wide (versus 1.2 mm), suborbicular (versus pyriform), distinctly truncate at the summit (versus tapered), pale-umbonate on the faces (versus uniformly brown), and with a thickened wire-like margin (versus usually with a less distinct margin). It is generally more robust, with leaves up to 5 mm wide (versus 3.5 mm).

HAB 9 B 5. **ABU** g9 s8 -2.

2567--*Rhynchospora capitellata* (Michx.) Vahl

Cyperaceae <Schoeneae s.l.>: *Rhynchospora capitellata*

This is widespread in much of eastern North America, but it is restricted to wet acid soils. Some Ky. colls. are difficult to distinguish from *glomerata*, and should be rechecked; see notes under that species.

HAB 9 B 5. **ABU** g10 s9 -2.

2568--*Rhynchospora capillacea* Torr. R

Cyperaceae <Schoeneae s.l.>: *Rhynchospora capillacea*

This northern species of damp calcareous sites extends south into some Appalachian regions. It is known in Adams County, Ohio, adjacent to Ky. There is a coll. by C.W. Short (PH) that is labeled Ky. but with no other data; the coll. might have come from another state.

2569--*Rhynchospora recognita* (Gale) Kral

Cyperaceae <Schoeneae s.l.>: *Rhynchospora recognita* (*globularis* var. r.)

This occurs from Central America to southeastern states, usually growing on wet acid soils that tend to dry out in summer and fall. Typical *globularis* is largely restricted to the southeastern Coastal Plain and unknown in Ky., but some colls. need to be rechecked. *R. harveyi* W. Boott is another related species to be expected in similar habitats, but generally drier and sometimes on or near sandstone outcrops. It is known from se. Mo. and nc.Tenn. within 25-50 miles of the state line.

HAB 9,6,10 B 5. **ABU** g9 s5 -3.

2570--*Cymophyllus fraserianus* (Ker-Gawl.) Kartesz & Gandhi

Cyperaceae <Cariceae>: *Cymophyllus* [*Carex*] *fraserianus* (*fraseri*)

HAB 5,4 A 3. **ABU** g8 s3 -1?

2571--*Carex picta* Steud.

Cyperaceae <Cariceae>: *Carex* <Pictae> *picta*

This mysterious species occurs in scattered disjunct localities on the Interior Low Plateaus, Appalachian Plateaus and the adjacent Coastal Plain (Ind., Ky., Tenn., Miss. & Ala.). It is one of the few dioecious sedges (Delph et al. 1993), and its clones tend to spread centrifugally, forming distinct dead-centered patches ("doughnuts"). *C. picta* burns well and then resprouts vigorously (D. Taylor, pers. comm.); its distribution may partly reflect the history of fire.

HAB 11,5,7 B 2. **ABU** g8 s7 -1.

2572--*Carex superata* Naczi, Reznicek & B.A. Ford

Cyperaceae <Cariceae>: *Carex* <Phyllostachyae> *superata* (*willdenowii* var. *megarrhynca*)

This recently described species occurs locally in thin subxeric woods on base-rich soils across southeastern states (Naczi et al. 1998). It is close to *willdenowii* but with perigynia much longer, culms relatively short, and peduncles often more erect (FNA 23).

HAB 12,11 D 2. **ABU** g8 s4? -4.

2573--*Carex willdenowii* Schkuhr ex Willd.

Cyperaceae <Cariceae>: *Carex* <Phyllostachyae> *willdenowii* (var. w.)

This occurs widely in east-central states but is largely restricted to woods on dry acid soils. Botanists in Ky. did not recognize the species until Wharton (1945) and Anderson (1947), although it had been described over a century before. Section *Phyllostachyae* has continued to provide surprises. "The *Carex willdenowii* group (*C. willdenowii*, *C. basiantha* & *C. superata*) differs from the other members of the section in having asynchronous spike production, resulting in a protracted fruiting season" (FNA 23; Naczi et al. 1998).

Variation may deserve further study; 2n = 62 and 78.

HAB 11,7 B 2. **ABU** g9 s9 -2.

2574--*Carex jamesii* Schwein.

Cyperaceae <Cariceae>: *Carex* <Phyllostachyae> *jamesii*

This is widespread across east-central states, generally occurring in shady, mesic woods on calcareous soils. Variation may need further study; 2n = 66 and 70 (FNA 23). Several colls. (FAYE, GREE, JESS, WOOD) from relatively damp sites have relatively wide leaves and purplish shoot bases, suggesting *timida*; see notes under that name.

HAB 5,7,11 D 1? **ABU** g9 s9 -3.

2575--*Carex timida* Naczi & B.A. Ford

Cyperaceae <Cariceae>: *Carex* <Phyllostachyae> *timida*

This uncommon species is known from somewhat disjunct localities of the Ozark-Ouachita region and the Interior Low Plateaus, usually in thin submesic to subxeric woods on calcareous soils. It was recently described by Naczi (2001; see also FNA 23), and easily confused with *jamesii*.

Compared to *jamesii*, the terminal spikes of *timida* (not the lateral spikes on capillary peduncles) have shorter staminate sections (mostly 3.4-5.6 mm versus 5.8-13.5 mm). These staminate sections have longer basal scales (1.9-3.3 mm versus 1.1-2.1 mm), covering a longer proportion of the staminate section (ca. 45-75% versus 15-25%). Other differences are less clear-cut: shorter perigynium beaks (mostly 1.4-2.3 mm versus 2.3-3.8 mm); often wider, deeper green leaves; distinctly red-purple shoot bases (versus usually reddish, dark or pale brown); and often more open tussocks.

HAB 7,11,5 D 2. **ABU** g6? s6? -3.

2576--*Carex juniperorum* Catling, Reznicek & Crins

Cyperaceae <Cariceae>: *Carex* <Phyllostachyae> *juniperorum*

This was described by Catling et al. (1993), and more details were supplied by Naczi & Ford (2001). It is known only from ne. Ky., se. Ohio, s. Mich. and s. Ont., usually in dry open woods and glades on calcareous clays that are damp to seeping in spring.

C. juniperorum differs from *jamesii* and *timida* (FNA 23) in its relatively short tallest culms per plant (ca. 3.2-9.1 cm versus 9-36 cm, ca. 15-35% of plant height versus 40-85%); its distal pistillate scales with less hyaline margin (0-0.3 mm wide versus 0.3-0.8 mm); and its usually shorter perigynium beaks (ca. 1.4-2.1 mm versus 2-5.5 mm). Leaves tend to be more coriaceous and evergreen.

HAB 12,10,7 +? D 3. **ABU** g4? s3? -4.

2577--*Carex leptalea* Wahlenb. var. *harperi* (Fern.) Weatherby & Grisc.

Cyperaceae <Cariceae>: *Carex* <Leptocephalae> *leptalea* var. *harperi*

This variable species is widely scattered across most of temperate and boreal North America. All material from Ky. appears to be the southeastern var. *harperi*, sometimes treated as a subspecies or species. Var. *harperi* has perigynia 3.4-4.9 (5.4) mm long (versus 2.5-3.5 mm); achenes are more sharply angled; pistillate scales are more slender, more overlapping and whitish. However, the more widespread northern and western var. *leptalea*

does extend south to Tenn. and N.C. in the Blue Ridge and Piedmont (W).

These taxa may intergrade in some regions of overlap (FNA 23), and further analysis is warranted in Ky.

HAB 6,9 B 3. **ABU** g9 s6 -2.

2578--*Carex communis* Bailey

Cyperaceae <Cariceae>: *Carex* <Acrocystis> *communis* (var. c.)

This is a widespread northeastern species of mesic to subxeric woods, with much variation that deserves further study. Perigynium shape and leaf width can be variable enough to confuse differences from other species (e.g. using the key in FNA 23), and some colls. should be rechecked. Several colls. from the Bluegrass or adjacent hills (BATH, FAYE, JESS, GARR & OLDH at KY, etc.), and perhaps elsewhere (CLAY, HARD & LAUR at KNK or DOV), have relatively narrow leaves. Some robust colls. from Appalachian regions are provisionally treated here as *amplisquama*; see notes under that name.

HAB 5,11,7 D 1? **ABU** g9 s9 -3.

2579--*Carex amplisquama* F.J. Herm.

Cyperaceae <Cariceae>: *Carex* <Acrocystis> *amplisquama* (*communis* var. a.)

Some of the more robust colls. below sandstone cliffs in se. Ky. that have been determined as *communis* are transferred here to *amplisquama*. This is a southern Appalachian taxon that is rather little known. It reportedly differs (FNA 23) in its generally broader leaves (mostly 2-5 mm versus 1-3 mm); its inflorescences relatively long (usually 4-6 cm versus 2.5-4 cm) and pale (versus often purplish); its relatively long basal bracts (often extending to the staminate tip versus up to half as long); its perigynia with wider scales (>1.6 mm versus usually <1.6 mm) and perhaps longer teeth (usually >0.2 mm versus usually 0.1-0.2 mm).

HAB 5,11 C 2. **ABU** g7? s5? =.

2580--*Carex pensylvanica* Lam.

Cyperaceae <Cariceae>: *Carex* <Acrocystis> *pensylvanica* (var. p.)

This spreading rhizomatous species is widespread in northeastern regions, typically in dry woods and openings on medium acid soils.

HAB 11,12,7,10 C 2? **ABU** g9 s9 -2.

2581--*Carex lucorum* Willd. ex Link var. *austrolucorum* J. Rettig

Cyperaceae <Cariceae>: *Carex* <Acrocystis> *lucorum** var. *austrolucorum* (p. var. *distans*)

This largely Appalachian taxon appears distinct from the more northeastern var. *lucorum*, which is unknown in Ky. and these taxa may deserve to be separate species (W). The disjunct coll. from WASH in the Bluegrass region (McKinney #4938 at EKY and KNK) has been verified by several botanists.
HAB 5,11 B 1. **ABU** g8 s8 -1.

2582--*Carex physorhyncha* Liebm. ex Steud.

Cyperaceae <Cariceae>: *Carex* <Acrocystis> *physorhyncha* (*albicans* var. *australis*)

This easily overlooked rhizomatous taxon of southeastern states can be difficult to separate from *pensylvanica* and *emmonsii*, appearing intermediate in some cases. However, the few colls. mapped here are generally distinct from e

Colls. from HARD (DHL, KY) and MCRE (KY) are included here, but the latter has been doubted by R.F. Naczi and A.A. Reznicek. Further analysis is needed.

HAB 10,12,11 B 4. **ABU** g9 s5 -4.

2583--*Carex emmonsii* Dewey ex Torr.

Cyperaceae <Cariceae>: *Carex* <Acrocystis> *emmonsii* (*albicans* var. *e.*; *varia*)

Mapping here is provisional. This cespitose taxon is concentrated in more southern regions than typical *albicans*, but differences in habitat do not appear to be clearcut (FNA 23, W). Distinction from *albicans* is often difficult, and some colls. appear intermediate; variety status may be preferable.

Compared to typical *albicans*, *emmonsii* has shorter staminate spikes (ca. 5-8.5 mm versus 8.4-11 mm), with midribs on median scales that are usually more prominent and minutely toothed; $2n = 40$ (versus 36 in *albicans* and *physorhyncha*). It also tends to have less erect culms, and more condensed spikes with less reddish tinging (F, W).

HAB 11,7,5 B? 3. **ABU** g9 s9 -2.

2584--*Carex albicans* Willd. ex Spreng.

Cyperaceae <Cariceae>: *Carex* <Acrocystis> *albicans* (*artitecta*, *nigromarginata* var. *muhlenbergii*)

This is a widespread eastern species. See notes under *emmonsii*, which is easily confused. There has also been confusion with *nigromarginata*, a name that was initially applied to some relatively broad-leaved colls. of *albicans* from CRIT and MCRA (WKY).

HAB 11,7,5 D 2. **ABU** g10 s10 -2.

2585--*Carex nigromarginata* Schwein.

Cyperaceae <Cariceae>: *Carex* <Acrocystis> *nigromarginata* (var. n.)

This densely cespitose, short-culmed species is widespread in southeastern states, but generally restricted to thin woods on dry acid soils. Some colls. need to be reassessed for segregation of *reznicekii*; see notes under that name.

HAB 11,12,7 B 3. **ABU** g9 s9 -2.

2586--*Carex reznicekii* Werier

Cyperaceae <Cariceae>: *Carex* <Acrocystis> *reznicekii*

This recently described species is close to *nigromarginata* (Werier 2006). It appears to occur on more base-rich soils, but further ecological data are needed. Its relatively narrow leaves and short culms also suggest *umbellata*, but it lacks the more clustered spikes of *umbellata* and *rugosperma* (which have frequent basal spikes and lack projecting staminate spikes). *C. reznicekii* is distributed from the mid-Atlantic Coastal Plain (especially Va.) to the Ozarks, and may be expected across much of Ky.

C. reznicekii differs from *nigromarginata* in its mostly narrower widest leaf blades (ca. 1.2-2.2 mm versus 2.3-4.5 mm); its mostly shorter (and often relatively uniform) longest culms (mostly 2-10 cm versus 6-40 cm); its pistillate scales with reddish color usually no more than submarginal (versus often reddish-black from margins to the stripes beside mid-veins); and its somewhat less extensive staminate spikes (usually no more than 3-4 mm above lateral spike apices, versus often up to 5-7 mm).

HAB 11,5 C 2. **ABU** g8 s6? -2?

2587--*Carex umbellata* Schkuhr ex Willd.

Cyperaceae <Cariceae>: *Carex* <Acrocystis> *umbellata* (*abdita*, "*tonsa*")

This densely cespitose, short-culmed species has been confused with *tonsa* (or *rugosperma*), and both taxa have been often overlooked due to their low hidden inflorescences. In Ky. and elsewhere *umbellata* appears to be typical of relatively base-rich soils in dry open woods and grasslands, "often at edges of ant hills" (FNA 23). However, it is variable across its range, and some populations may occur in more acid or sandy soils (e.g. Y).

HAB 12,10 + D 3. **ABU** g9 s9 -3.

2588--*Carex rugosperma* Mackenzie

Cyperaceae <Cariceae>: *Carex* <Acrocystis> *rugosperma* ("umbellata", *tonsa* var. r.)

This northeastern species has been confused in nomenclature with *tonsa* and *umbellata*, and should perhaps be treated a variety of *tonsa* (FNA 23). In Ky., it is restricted to dry sandy soils, especially on open sandstone clifftops. Typical *tonsa* is somewhat more northern and unknown in Ky., but further revision is needed.

Both *rugosperma* and *tonsa* are distinct from *umbellata* in their generally longer perigynia (3.1-4.7 mm versus 2.2-3.2 mm), with longer beaks (0.9-2 mm versus 0.4-1 mm). Also, their leaves are often relatively wide (up to 4.3 mm versus 2.3 mm), short (sometimes equalled by stems versus never in *umbellata*), bright-green and coriaceous.

HAB 12 +\ A 4. **ABU** g8 s8 -1.

2589--*Carex pedunculata* Muhl. ex Willd.

Cyperaceae <Cariceae>: *Carex* <Clandestinae> *pedunculata*

In Ky. this widespread northeastern species is restricted to mesic ravines on the western side of the Appalachian Plateaus. It usually occurs on cool bouldery slopes below cliffs, with limestone or sandstone. *C. pedunculata* is one of the few sedges in North America that has well-developed "elaiosomes"---small fleshy oil-rich attachments to seeds that promote dispersal by ants.

HAB 5 /+ C 2. **ABU** g9 s7 =.

2590--*Carex hirtifolia* Mackenzie

Cyperaceae <Cariceae>: *Carex* <Hirtifoliae> *hirtifolia*

This northeastern species may be most common on moist base-rich soils in midwestern regions (PL). Its distribution in Ky. appears curiously fragmented, being virtually unknown along the Ky. Rv. Palisades, Shawnee Hills and Green Rv. hills (including the Mammoth Cave area). It is the only sedge typical of mesic woods in Ky. that has moderately broad (3-8 mm) leaves that are densely hairy.

HAB 5,7 D 1? **ABU** g9 s8 -3.

2591--*Carex eburnea* Boott

Cyperaceae <Cariceae>: *Carex* <Albae> *eburnea*

This extremely slender, densely tufted sedge is widely distributed over east-central and northern states but largely restricted to calcareous substrates. In

Ky. it occurs mostly on xeric ledges on limestone cliffs along the western edge of the Appalachian Plateaus, and along the Kentucky River Palisades.

HAB 12 +\ E 4. **ABU** g10 s8 =.

2592--*Carex woodii* Dewey

Cyperaceae <Cariceae>: *Carex* <Paniceae> *woodii* (*tetanica* var. w.)

This rather poorly known species mostly occurs in woods on base-rich soils from the upper midwest to central Appalachian regions (FNA 23; W). In Ky. it is largely restricted to low slopes and terraces in the northern Cliff Section and adjacent Knobs, within the Licking Rv. watershed and creeks to the north. Variation in *woodii* and distinction from related species may need clarification; $2n = 44$ and 52 . The coll. from BATH (KY) has been redetermined as *meadii* by R. Naczi, but it appears somewhat transitional to *woodii*.

HAB 4,7,5 ::? D 3. **ABU** g8 s6 -2.

2593--*Carex meadii* Dewey

Cyperaceae <Cariceae>: *Carex* <Paniceae> *meadii* (*tetanica* var. m.)

This is widespread in eastern and central North America, but most common in the mid-west and concentrated on calcareous soils. See notes under *tetanica* and *woodii*.

HAB 12,10,11 D 4. **ABU** g9 s8 -4.

2594--*Carex tetanica* Schkuhr T

Cyperaceae <Cariceae>: *Carex* <Paniceae> *tetanica* (var. t.)

This close relative of *meadii* occurs in north-central states and adjacent Canada, often on damper sites. It is often difficult to distinguish from *meadii* and there may be intergradation, but authorities consider the two taxa to be distinct species (FNA 23). Some colls. from Ky. have been determined as *tetanica*, following older manuals (e.g. F, Cr); colls. from LEWI (A. Cusick at MICH) and ROWA (A. Risk at MDKY) have been particularly convincing. However, most or all colls. have now been redetermined as *meadii* by R. Naczi or A.A. Reznicek.

C. tetanica tends to have narrower spikes than *meadii* (3-5.8 mm versus 3.5-8 mm), narrower achenes (1.2-1.8 mm versus 1.7-2.5 mm), and more elongated ligules (l/w 0.8-2 versus 0.4-1.2); $2n = 56$ versus 52 .

HAB 9,10,12? D 4. **ABU** g9 s5 -4.

2595--*Carex abscondita* Mackenzie

Cyperaceae <Cariceae>: *Carex* <Careyanae> *abscondita*
In Ky. the only verified record of this southeastern species is a coll. from CALL: L. McKinney #4198 (EKY; Naczi et al. 2001). All other previous records of this species were segregated as the new species, *cumberlandensis*. *C. abscondita* has ca. 8-13 perigynia (versus 4-8), spirally overlapping (versus distichous) in the spikes, and other differences.
HAB 6,4,7 D 2. **ABU** g9? s4? -3.

2596--*Carex cumberlandensis* Naczi, Kral & Bryson

Cyperaceae <Cariceae>: *Carex* <Careyanae> *cumberlandensis*
This recently described species occurs in unglaciated Appalachian regions, Piedmont, and non-calcareous sections of the Interior Low Plateaus (Naczi et al. 200; FNA 23). It was segregated from the more southern *abscondita*, which occurs mostly on the Coastal Plain. Records of *abscondita* from Palmer-Ball et al. (1988), Cusick (1989), McKinney et al. (2000) and others should generally be transferred to *cumberlandensis*.
HAB 7,5,4,11 C 1. **ABU** g9 s9 -2.

2597--*Carex digitalis* Willd. var. *macropoda* Fern.

Cyperaceae <Cariceae>: *Carex* <Careyanae> *digitalis* var. *macropoda*
This southeastern taxon is generally distinct and may deserve species status (Ford et al. 2006; R. Naczi, pers. comm.). It is locally abundant in relatively mesic woods of LYON, TRIG (WKY) and nearby, often without typical *digitalis*. Some colls. (CALL & CARL at MUR) have been considered transitional to var. *asymmetrica* Fern., which was combined with the more southern var. *floridana* (L.H. Bailey) Naczi & Bryson in FNA 23.

Var. *macropoda* differs from typical *digitalis* in its terminal (staminate) spikes usually exceeding upper bracts (versus the upper bracts exceeding the spikes), with longer well-developed peduncles (usually 8-15 cm versus 1-7 cm); perigynia usually have fewer nerves per face (7-10 versus 11-15); and well-developed leaf blades are usually narrower (2-2.9 mm versus 2.7-4.5 mm).

HAB 5,7,11 C 2. **ABU** g8 s8 -3.

2598--*Carex digitalis* Willd. var. *digitalis*

Cyperaceae <Cariceae>: *Carex* <Careyanae> *digitalis* var. *d.*
This is widespread on acid soils in mesic to suberic woods of eastern North America, except the upper mid-west and southeastern Coastal Plain. There has

been confusion in Ky. with several other species, especially based on colls. that are immature or incomplete.

HAB 11,5,7 C 2. **ABU** g9 s9 -2.

2599--*Carex laxiculmis* Schwein. var. *laxiculmis*

Cyperaceae <Cariceae>: *Carex* <Careyanae> *laxiculmis* var. *l.*
This is widespread on damp acid soils in woods of eastern North America, except on the southeastern Coastal Plain. There has been some confusion in Ky. with the more northern var. *copulata*, and some records need to be rechecked.

HAB 5,6,4 C 2. **ABU** g9 s9 -3.

2600--*Carex laxiculmis* Schwein. var. *copulata* (Bailey) Fern.

Cyperaceae <Cariceae>: *Carex* <Careyanae> *laxiculmis* var. *copulata*
This has been considered a hybrid of *laxiculmis* and *digitalis* (F), but such origin is not supported by recent evidence. Ranges and habitats of var. *copulata* do not appear to differ much, but it is concentrated in the mid-west and may be typical of more base-rich soils. It is currently treated as a variety of *laxiculmis* (A. Reznicek et al. in FNA 23), and potential evidence for species status is being assessed (R. Naczi, pers. comm.). Leaves of var. *copulata* are usually bright green (versus glaucous) and narrower (5.3-8.3 mm versus 6.4-11.8 mm); its staminate spikes tend to be longer (the longest per plant usually 6-20 mm versus 12-25 mm).

HAB 6? D? 2. **ABU** g8? s4? -2.

2601--*Carex platyphylla* Carey

Cyperaceae <Cariceae>: *Carex* <Careyanae> *platyphylla*
This is a largely Appalachian species, but it often occurs on calcareous soils and extends locally into the Interior Low Plateaus. It is a variable polyploid; $2n = 68$ and 70 . A coll. from CART (MDKY) suggest hybridization with *blanda*.

HAB 5,11 + D 2. **ABU** g8 s8 -2.

2602--*Carex austrocaroliniana* Bailey

Cyperaceae <Cariceae>: *Carex* <Careyanae> *austrocaroliniana*
This southern Appalachian species is largely restricted to acid soils on low rocky slopes in wooded ravines. It is the least widespread member of a distinctive group of mesophytic sedges with purple bases and high chromosome numbers: *austrocaroliniana* ($2n = 60$); *careyana* ($2n = 68$); and *plantaginea* ($2n = 50$ and 52).

HAB 5 C 2. **ABU** g6 s6 =.

2603--Carex careyana Torr. ex Dewey

Cyperaceae <Cariceae>: Carex <Careyanae> careyana

This is widely scattered in the central Mississippi Valley and Ohio Rv. watersheds, but largely restricted to wooded ravines on calcareous soils.

HAB 5,11 + E 1. **ABU** g8 s8 -1.

2604--Carex plantaginea Lam.

Cyperaceae <Cariceae>: Carex <Careyanae> plantaginea

In Ky, this northeastern species is largely restricted to mesic ravines in Appalachian regions. However, there are disjunct localities on acid soils of the Interior Low Plateaus.

HAB 5 C 1. **ABU** g8 s8 -2.

2605--Carex albursina Sheldon

Cyperaceae <Cariceae>: Carex <Laxiflorae> albursina (laxiflora var. latifolia)

This is widespread in eastern North America, but largely restricted to less disturbed wooded slopes on base-rich soils. Although it is clearly a distinct species (2n = 44), immature or incomplete colls. have often been misidentified as laxiflora or other relatives; see also notes under kraliana.

HAB 5 + E 1. **ABU** g9 s9 -2.

2606--Carex kraliana Naczi & Bryson

Cyperaceae <Cariceae>: Carex <Laxiflorae> kraliana

This was recently described by Naczi et al. (2002b). It is apparently widespread in mesic woods on medium-acid soils in east-central states, but data need to be accumulated. Superficially, kraliana appears intermediate between albursina, laxiflora and blanda. Most colls. in herbaria have been previously named blanda, but kraliana differs in its upper lateral bracts broader and hiding spikes (like albursina), and its perigynium less bent (more like laxiflora). Lower leaves are generally similar to laxiflora. C. laxiflora var. serrulata F. J. Herm. was considered a synonym of kraliana in some initial work, but it should be included with typical laxiflora (R. Naczi, pers. comm.).

HAB 5,11 C 1. **ABU** g9? s9? -2.

2607--Carex gracilescens Steud.

Cyperaceae <Cariceae>: Carex <Laxiflorae> gracilescens (laxiflora var. gracillima)

This variable species (2n = 33, 38, 40) is widespread across eastern North America, but rare to absent on the southeastern Coastal Plain. In Ky, gracilescens is typical of streambanks on acid soils, but there are a few records from calcareous regions. It has often been confused with blanda and other species in Laxiflorae or even Griseae. Compared to blanda (F, Cr, FNA 23), gracilescens has perigynia that are mostly shorter (ca. 2.2-3 mm versus 2.5-4 mm), but with the beak more prolonged and "often proboscis-like" (versus abruptly contracted and short). The distinctive purplish or reddish color of the lowest sheaths is sometimes obscure or faded in colls.

HAB 4,5,7 C 2. **ABU** g9 s9 -3.

2608--Carex blanda Dewey

Cyperaceae <Cariceae>: Carex <Laxiflorae> blanda (laxiflora var. b.)

This widespread, weedy species is often confused with other species.

Occasional hybrids are suspected (e.g. with digitalis in WARR at BERA), but there is little direct evidence of hybridization across its range (FNA 23). There is considerable variation in perigynium shape, length of the staminate peduncle, and chromosome numbers (2n = 30, 32, 34, 36, ?40).

HAB 7,10,4,6 D 3. **ABU** g10 s10 -1?

2609--Carex purpurifera Mackenzie

Cyperaceae <Cariceae>: Carex <Laxiflorae> purpurifera (laxiflora var. p.)

This occurs mostly on the Cumberland Plateau, but it also extends east to the Southern Appalachians, and locally west into c. Ky. and c. Tenn. (FNA 23, PL). A coll. from HARL (BEREA) suggests hybridization with digitalis, but there may be considerable variation with purpurifera (2n = 34, 36, 38).

HAB 5 C 1. **ABU** g8 s8 -1.

2610--Carex laxiflora Lam.

Cyperaceae <Cariceae>: Carex <Laxiflorae> laxiflora (var. l., serrulata)

Identifications and variation may still need further study, since several other species are closely related, but typical laxiflora appears to be a relatively uniform, widespread eastern species (2n = 40). Hybrids are virtually unknown (FNA 23). A few colls. have been named var. serrulata F.J. Herm. (CAMP, MAGO, PULA), with serrulate angles on bract sheaths, but that taxon is now considered insignificant (Naczi et al. 2002b).

HAB 5,7,11 D 1? **ABU** g9 s9 -3.

2611--Carex striatula Michx.

Cyperaceae <Cariceae>: *Carex* <Laxiflorae> *striatula* (*laxiflora* var. *angustifolia*)

This southeastern species ($2n = 36, 40$) has often been confused with *laxiflora* or *styloflexa*. It is close to *laxiflora*, but is usually distinct in its larger perigynia (ca. 3.9-5.1 mm long versus 3.2-4.1 mm) and longer staminate spikes (ca. 22-32 mm versus 12-24 mm); also, foliage is usually glaucous in Ky. (versus plain green). *C. striatula* is relatively frequent in Appalachian regions of Ky., and it probably also occurs further west in Ky. and s. Ind. (F). However, some western colls. may be atypical or need further verification (especially with immature perigynia).

HAB 7,10,11 B 4. **ABU** g9 s8 -2.

2612--*Carex styloflexa* Buckl.

Cyperaceae <Cariceae>: *Carex* <Laxiflorae> *styloflexa*

This southeastern species ($2n = 48$) appears most closely related to *striatula* (of drier habitats). Its spikes are mostly shorter (ca. 0.5-2 cm versus 1-3 cm) and denser, with the lowest on a long, arching or drooping peduncle (versus short, erect or ascending); its perigynia tend to have a more distinct, long-narrowed and strongly outcurved beak. There has also been some confusion with *gracilescens*, which often occurs in similar habitats; but the more extended fusiform perigynium beaks of *striatula* are distinctive, and its basal sheaths are not purplish or reddish as in fresh *gracilescens* (FNA 23, W).

HAB 6,7,5 B 3. **ABU** g9 s7 -2.

2613--*Carex crebriflora* Wieg.

Cyperaceae <Cariceae>: *Carex* <Laxiflorae> *crebriflora*

This southeastern species ($2n = 42$) of lowland woods has recently been collected from HICK on slopes above Three Ponds by L. McKinney (KSNPC database). No coll. has been located to support Cranfill's (1991) record from HARD, which seems less likely. *C. crebriflora* is scattered across Tenn. and Va., including some counties close or adjacent to Ky.

The fusiform perigynia of *crebriflora* resemble those of *laxiflora*, *styloflexa* and *striatula*, except that their apices are erect (versus more or less curved) and they are ascending in the spikes (versus spreading). Its distal spikes are overlapping (versus separate), and equalling or exceeding the terminal staminate spike (versus clearly exceeded). Also, lower peduncles arise at least half way up the culm (versus in the lower third).

HAB 4,5,7 D 2. **ABU** g8 s2 -3.

2614--*Carex leptonevria* (Fern.) Fern.

Cyperaceae <Cariceae>: *Carex* <Laxiflorae> *leptonevria* (*laxiflora* var. *le.*)

This northeastern species ($2n = 36$) extends south in the Appalachians mostly at high elevation (PL). B collected it on Black Mountain in HARL (US).

Other colls. there have been made by M. Medley (for WKY) and T. Wieboldt (Virginia Polytechnic Institute).

HAB 5,6 C? 1. **ABU** g8 s2 -1?

2615--*Carex granularis* Muhl. ex Willd.

Cyperaceae <Cariceae>: *Carex* <Granulares> *granularis*

This is widespread on damp base-rich soils across eastern and central North America. Although there is much variation across the range ($2n = 36-42$; FNA 23), plants in Ky. appear relatively uniform.

HAB g-9,10,6,7 E 5. **ABU** g9 s9 -2?

2616--*Carex crawei* Dewey

Cyperaceae <Cariceae>: *Carex* <Granulares> *crawei*

This short species is widespread, but easily overlooked, in seasonally wet calcareous open areas across cool temperate regions of North America (K). However, there is much disjunction between major populations. In Ky. it is only locally abundant, especially in glades of the Nolin River and lower Salt River watersheds. In Tenn. it is known only from the Nashville Basin (Ch). More searching is needed; several records mapped here remain unconfirmed, based on colls. that have not been located or checked (including data of NP).

HAB g-10,12,9 +:: D 5. **ABU** g9 s6 -3.

2617--*Carex hitchcockiana* Dewey

Cyperaceae <Cariceae>: *Carex* <Griseae> *hitchcockiana* (*oligocarpa* var. *h.*)

This is widely scattered in northern and midwestern regions, but generally restricted to mesic woods on rocky calcareous soils in relatively deep ravines. It has sometimes been confused with *oligocarpa*, a less robust species that is more common and often grows in the same habitat. One of the clearest differences in *hitchcockiana* (F; FNA 23) is its brown culm bases (versus purple-red). Also, perigynia are usually longer (mostly 4.6-5.6 mm versus 3.7-4.7 mm), and sheaths are hispidulous (versus glabrous). There is little difference in leaf width.

HAB 11,5 +? E 1. **ABU** g8 s7 -3.

2618--*Carex oligocarpa* Schkuhr ex Willd.

Cyperaceae <Cariceae>: *Carex* <Griseae> *oligocarpa* (var. *o.*)

This is typical of mesic to subxeric woods on base-rich soils in east-central states.

HAB 7,11,5 E 2. **ABU** g9 s9 -3.

2619--Carex planispicata Naczi

Cyperaceae <Cariceae>: *Carex* <Griseae> *planispicata* (*amphibola*/*grisea* var. *rigida*)

Before their recent description as a species (Naczi 1999), this southeastern plants were often considered intermediate between *amphibola* and *grisea*. Naczi showed that *planispicata* is closer to *oligocarpa*, which shares the distichous arrangement of perigynia and purplish shoot bases. *C. planispicata* differs from *oligocarpa* in its more elongated perigynia (l/w = usually 2.5-3.3 versus 2.1-2.6) with tapering apices; its relatively short achenes; its longest spikes with more perigynia (usually 7-14 versus 4-8); and its broader leaves (up to 3.5-6.5 mm versus 1.8-4 mm). It tends to occur on more acid loamy soils, often on toe-slopes and terraces.

HAB 7,5,4 C 2? **ABU** g9? s9? -3.

2620--Carex corrugata Fern.

Cyperaceae <Cariceae>: *Carex* <Griseae> *corrugata* ("amphibola")

This ranges widely across southeastern states, and is most common along larger rivers. It typically occurs on poorly drained, clayey, base-rich alluvial soil, in contrast to *grisea* and (especially) *amphibola*. *C. corrugata* has recently been discovered in Ky. (Naczi et al. 2002), and more colls. of the *amphibola* group need to be reviewed.

Though often confused with *grisea* and *amphibola* (e.g. Cr), *corrugata* is clearly a separate species; $2n = 58-62$ versus $52-56$ (FNA 23). Its perigynia are relatively short (ca. 3.9-4.5 mm versus 4.2-5 mm), and distinct from *amphibola* in their broader shape (l/w ca. 1.7-2.3 versus 2.5-3.1), with the achene widest at ca. 0.7 from base (versus 0.6). Its blades tend to be narrower (mostly 4-5 mm versus 4-7 mm) and its basal sheaths are more consistently purple.

HAB 6,9,4 E 3. **ABU** g7? s6? -4.

2621--Carex amphibola Steud.

Cyperaceae <Cariceae>: *Carex* <Griseae> *amphibola* (var. a.)

This widespread eastern species of damp to dry acid soils has been confused with *planispicata*, *corrugata*, *grisea* and other species; see notes under those names. Some colls. from Ky. need to be rechecked.

HAB 7,6,11 C 3. **ABU** g9 s9 -2.

2622--Carex grisea Wahlenb.

Cyperaceae <Cariceae>: *Carex* <Griseae> *grisea* (*amphibola* var. *turgida*)

This widespread eastern species is close to *amphibola* and *corrugata* (FNA 23), and there has been much confusion (e.g. Cr). *C. grisea* differs from both those species in its more elongated achene bodies (usually 3.1-3.5 mm versus 1.8-2.3 mm) on relatively short stipes (mostly 0.3-0.4 mm versus 0.4-0.6 mm). Compared to *amphibola*, the perigynia of *grisea* are wider (usually 2-2.6 mm versus 1.5-1.9 mm), less elongated (l/w = 1.8-2.3 versus 2.5-3.1), and more rounded in cross-section. Compared to *corrugata*, its perigynia are longer (usually 4.5-5.1 mm versus 3.9-4.5 mm) but with similar l/w ratio.

HAB 7,10 D 3. **ABU** g9 s9 -3.

2623--Carex flaccosperma Dewey

Cyperaceae <Cariceae>: *Carex* <Griseae> *flaccosperma* (var. f.)

This southeastern species is closely related to the less robust *glaucodea*, and there may be some intergradation (FNA 20); some authors have combined these taxa (e.g. Cr). In Ky. there are only a few verified records of *flaccosperma*, all from western lowlands. Several previous records from the state are referable to *glaucodea* (M).

C. flaccosperma is best distinguished from *glaucodea* by its achenes, with bodies only 37-50% as long as perigynia (versus 50-67%), and beaks straight to bent less than 30 degrees (versus bent 30-90 degrees). Both species have distinctively glaucous leaves, but those of *flaccosperma* tend to be broader (mostly 7-14 mm versus 6-10 mm).

HAB r-9,10? :: D 4. **ABU** g9 s2? -4.

2624--Carex glaucodea Tuckerman ex Olney

Cyperaceae <Cariceae>: *Carex* <Griseae> *glaucodea* (*flaccosperma* var. g.)

This occurs widely from mid-Atlantic states to the central Mississippi Valley. It is partly replaced in southeastern states (Va. to Miss.) by the closely related *C. pigra* Naczi (FNA 20). *C. glaucodea* usually grows on disturbed ground with seasonally damp medium-acid soil. See notes under *flaccosperma*.

HAB r-10,9 :: C 4. **ABU** g9 s9 -2?

2625--Carex ouachitana Kral, Manhart & Bryson

Cyperaceae <Cariceae>: *Carex* <Griseae> *ouachitana*

This largely Ozarkian species occurs at scattered disjunct locations in the southern Interior Low Plateaus, and has been recently identified in CLIN (Naczi et al. 2002). It is a robust plant, with long thick rhizomes and exerted terminal spikes.

HAB 7,11 C 3. **ABU** g6 s2? -4.

2626--Carex oxylepis Torr. & Hook.

Cyperaceae <Cariceae>: Carex <Hymenochlaenae> oxylepis

This is a widespread variable southeastern species that occurs in woods on damp or dry calcareous soils (FNA 23; Y, W). *C. oxylepis* can be confused with *gracillima* or *davisii*, and a few outlying records remain uncertain.

Records of var. *pubescens* are included here, but see notes under that name.

HAB 7,5 D 2. **ABU** g8 s7 -3.

2627--Carex oxylepis Torr. & Hook. var. pubescens J.K. Underwood T

Cyperaceae <Cariceae>: Carex <Hymenochlaenae> oxylepis var. *pubescens*
Further research is needed to determine the status of this taxon, which may be restricted to the central Mississippi Valley or nearby (PL). Var. *pubescens* has not generally been recognized in recent treatments (FNA 23). It was recently discovered in CLIN and LYON by R. Naczi (Naczi et al. 2002) and L. McKinney (EKY; det. T.W. Smith).

HAB 11,7 D 2. **ABU** g4? s2 -3?

2628--Carex davisii Schwein. & Torr.

Cyperaceae <Cariceae>: Carex <Hymenochlaenae> davisii

This largely midwestern species is locally abundant in relatively thin woods and meadows, on moist fertile uplands as well as lowlands. It is often associated with *Elymus* spp. and other graminoid vegetation under trees such as walnut and hackberry. The coll. from MARS (WKY) was referred to forma *glabrescens* G. Kukenthal, but that taxon has not been recognized in recent treatments.

HAB g-7,8,10 E 4. **ABU** g9 s8 -4.

2629--Carex gracillima Schwein.

Cyperaceae <Cariceae>: Carex <Hymenochlaenae> gracillima

This is a widespread, variable northeastern species in woods on acid soils. In Ky. and Tenn. it is largely restricted to Appalachian regions, but disjunct plants have been identified in gravelly hills on the west side of the Mississippian Plateaus. *C. gracillima* is a variable species (2n = 50, 52, 54) that is reputed to form sterile hybrids with several related species (FNA 23).

The potential for confusion or intergradation with *oxylepis*, in particular, needs further investigation.

HAB 5,7 B 2. **ABU** g8 s8 -2.

2630--Carex aestivalis M.A. Curtis ex Gray

Cyperaceae <Cariceae>: Carex <Hymenochlaenae> aestivalis

In Ky. this distinct Appalachian species (2n = 56) is known only from high elevation in the Cumberland Mts. (initially collected by T. Kearney in 1893), and from two cool ravines at the western edge of the Cumberland Plateau (colls. of G. Libby in 1990s).

HAB 5 B 2. **ABU** g9 s4 -1?

2631--Carex roanensis F.J. Herm.

Cyperaceae <Cariceae>: Carex <Hymenochlaenae> roanensis

This species of the Southern Appalachian mountains was recently discovered in HARL (EKY) on Black Mountain at 3600-3800 ft (Naczi et al. 2002). Its status as a distinct species has been confirmed, but it has affinities with both *aestivalis* and *virescens* (FNA 23; Smith & Waterway 2008b).

HAB 5 B 2. **ABU** g5 s2 -1.

2632--Carex venusta Dewey

Cyperaceae <Cariceae>: Carex <Hymenochlaenae> venusta

This southeastern species occurs mostly on the Coastal Plain east of the Mississippi Rv. (Miss. to N.Y.), plus disjunct localities in the southern Interior Low Plateaus and southern Appalachians (FNA 23, K). The only Ky. record is a coll. from CALL (EKY): L.E. McKinney #4195 22 May 1990, seep along Dalton Road off Ky. 280, parallel to lake shore.

C. venusta differs from *debilis* in its more crowded spikes, ca. 4-5 mm thick (versus 2-3 mm) and ca. 1-5 cm long (versus 2.5-8 cm), with internodes 1-1.5 (3) mm (versus 2-4 (9) mm); 2n = 42-50 (versus 50-56). Pistillate scales are often tinged reddish-brown along sides (versus whitish), and at least half as long as perigynia (versus less than half). The coll. from CALL has glabrous perigynia.

HAB 6,9 C 2. **ABU** g9 s8 -4.

2633--Carex debilis Michx. var. debilis

Cyperaceae <Cariceae>: Carex <Hymenochlaenae> debilis var. d.

This southeastern taxon is close to var. *rudgei*, and some colls. from Ky. should be rechecked. *C. debilis* is a complex variable species that needs further investigation; $2n = 50$ to 60 (FNA 23).

HAB 6,9 C 2. **ABU** g9 s8 -4.

2634--*Carex debilis* Michx. var. *pubera* Gray

Cyperaceae <Cariceae>: *Carex* <Hymenochlaenae> *debilis* var. *pubera* (*C. allegheniensis*)

This largely Appalachian taxon of relatively wet sites is close to var. *rudgei* and has been combined in FNA 23 and other treatments, but W has maintained it as a species. Further analysis is needed. Both var. *debilis* and var. *rudgei* may have some pubescence on perigynia (FNA 23). A more distinctive character of var. *pubera* is reported to be the generally short-awned scales (and perhaps reddish-brown margins).

HAB 6,7,10 B 3. **ABU** g8? s7? -3.

2635--*Carex debilis* Michx. var. *rudgei* Bailey

Cyperaceae <Cariceae>: *Carex* <Hymenochlaenae> *debilis* var. *rudgei* (*C. flexuosa*)

This northeastern taxon is close to typical *debilis*, and seems to differ only in its shorter perigynia, with little or no clear difference in shape. Most modern caricologists do not treat it as a species (FNA 23; R. Naczi, pers. comm.), but W has done, noting that it often occurs in relatively dry or rocky habitats. Occasional hybrids with *virescens* or *swanii* are reported from other states (FNA 23).

HAB 6,9 B 2. **ABU** g9 s8? -3.

2636--*Carex prasina* Wahlenb.

Cyperaceae <Cariceae>: *Carex* <Hymenochlaenae> *prasina*

This distinct species ($2n = 60$) is widespread in eastern North America, except on the southeastern Coastal Plain. However, it is restricted to wet acid soils and concentrated in Appalachian regions; see notes on habitat under *scabrata*. In Ky. disjunct western records are confirmed: from BOON (DOV), R. Naczi #8019 (DOV) from a seep along Gunpowder Creek; and from HARD (EKY; Cranfill 1991). A record from "High Bridge" in JESS (Anderson 1924) remains dubious.

HAB 6,9,3 B 3. **ABU** g8 s8 -2.

2637--*Carex cherokeensis* Schwein.

Cyperaceae <Cariceae>: *Carex* <Hymenochlaenae> *cherokeensis*

This is locally abundant in calcareous woodlands and grasslands across south-central states (FNA 23, K), and it appears to be locally adventive further north (A. Reznicek, pers. comm.). It was recently found in or near roadsides in HART (JC) and in MADI (EKY; McKinney et al. 2000): R. Mears, 11 May 1995, calcareous roadside and open rocky areas, N of Berea along the east side of Hwy 25 just S of junction with Ky. 1983. *C. cherokeensis* is superficially similar to *davisii* and *oxylepis*, but has tough coarse creeping rhizomes (versus very short or lacking).

HAB 11,12 E 3. **ABU** g8 s2? -2.

2638--*Carex complanata* Torr. & Hook.

Cyperaceae <Cariceae>: *Carex* <Porocystis> *complanata* (var. *c.*)

This is close to *hirsutella*, and there has been some confusion, but recent analysis has confirmed the distinction of these two species (Smith & Waterway 2008a). *C. complanata* is more southern and generally occurs on damper lowland sites. The only consistent observable difference is that leaves are glabrescent, especially on adaxial surfaces; *hirsutella* has blades more uniformly and densely pilose, at least on lower leaves (FNA 23; T.W. Smith, pers. comm). *C. complanata* also tends to have less distinct nerves on perigynia (Cr). It has also been confused with *caroliniana* (or even considered transitional), due to its relatively smooth leaves and perhaps other characters.

HAB f-9,10 C 4. **ABU** g8 s6? -3.

2639--*Carex hirsutella* Mackenzie

Cyperaceae <Cariceae>: *Carex* <Porocystis> *hirsutella* (*complanata*/triceps var. *hirsuta*)

This is a widespread weedy species in eastern North America, except on the southeastern Coastal Plain. It is relatively variable compared to related species, but the rare hybrids that have been discovered are sterile or nearly so (Smith & Waterway 2008a). See notes under *complanata* and *caroliniana*.

HAB F-10,9,7 C 5. **ABU** g10 s10 +1?

2640--*Carex caroliniana* Schwein.

Cyperaceae <Cariceae>: *Carex* <Porocystis> *caroliniana* (triceps var. *smithii*)

This widespread southeastern species has often been confused with related species. *C. caroliniana* ($2n = 48$) differs from *complanata* ($2n$ unknown) and *hirsutella* ($2n = 52$) in its perigynia (FNA 23, W), which are minutely beaked (0.1-0.2 mm versus beakless), terete to subtriangular in cross-section (versus flattened-triangular), and usually more spreading (at >45 degrees versus appressed-ascending). Leaf blades are mostly glabrescent, as in *complanata*.

HAB f-9,6 C 4. **ABU** g9 s9 -3.

2641--Carex bushii Mackenzie

Cyperaceae <Cariceae>: *Carex* <Porocystis> *bushii* (caroliniana var. cuspidata; triceps)

Several colls. from Ky. have been determined as this largely midwestern species, especially by R. Athey on the Coastal Plain, where it seems to be native in seasonally damp grasslands. There are scattered reports of *bushii* from across southeastern states, but it may be somewhat adventive, and there has been confusion with *caroliniana* or *hirsutella*. Different authors have emphasized different diagnostic characters for *bushii* (F, Cr, FNA 23; T.W. Smith, pers. comm.); also $2n = 64$ according to FNA 23, but there is an earlier record of 48 (Wahl 1940).

C. bushii is distinguished from *caroliniana* and *hirsutella* primarily by its strongly cuspidate scales (3-5.2 mm long versus 1.5-3 mm). Perigynia are less distinctive, but typically more papillose, more strongly nerved, round in cross-section, relatively large and few per spike (FNA 23). Compared to *carolinaia*, *bushii* is generally more hairy on leaves, especially the sheaths, and on spikes.

HAB f-10,9 C 5. **ABU** g8? s5? -4?

2642--Carex swanii (Fern.) Mackenzie

Cyperaceae <Cariceae>: *Carex* <Porocystis> *swanii* (*virescens* var. s.)

This is concentrated in subxeric woods of Appalachian regions or nearby, but also extend west to the Ozarks (FNA 23, K). See notes under *virescens*.

HAB 11,7 B 3. **ABU** g9 s9 -2.

2643--Carex virescens Muhl. ex Willd.

Cyperaceae <Cariceae>: *Carex* <Porocystis> *virescens* (var. v.)

This occurs mostly in mesic to subxeric woods of Appalachian regions or nearby, but it also extends west to the Shawnee Hills and Ozarks (FNA 23, K). *C. virescens* is similar to *swanii*, and occasional colls. may appear intermediate (e.g., from BARR at WKY). Some older treatments included *swanii* (e.g. Anderson 1924; M). However, *virescens* is now generally accepted as a distinct species; $2n = 60$ (versus 54 in *swanii*). Moreover, *swanii* is probably closer to *hirsutella* based on recent genetic analysis (Smith & Waterway 2008b; T.W. Smith, pers. comm.).

HAB 11,5 B 2. **ABU** g9 s9 -2.

2644--Carex pellita Muhl. ex Willd.

Cyperaceae <Cariceae>: *Carex* <Hirtae> *pellita* ("lanuginosa"; *lasiocarpa* var. *latifolia*)

This distinct polyploid ($2n = 78$) is widespread across northern states and adjacent Canada, but known in Ky. only from one locality: wet meadows and open swamps in Ballard County Wildlife Management Area (colls. of R. Athey at KY, EKY, WKY).

HAB f-9? C? 5. **ABU** g10 s2 -4?

2645--Carex scabrata Schwein.

Cyperaceae <Cariceae>: *Carex* <Anomalae> *scabrata*

This distinctive northeastern species occurs mostly in Appalachian regions and around the Great Lakes. Disjunct southwestern records, as far as the Ouachitas, are mostly old and obscure (FNA 23, K). In Ky. it is among the few strongly rhizomatous sedge species, and it is largely restricted to damp acid soils on fresh sandy alluvium along small streams or in nearby seeps. *C. prasina* has similar range and habitat, but grows in more stabilized vegetation and is strictly cespitose.

HAB 1,6 ::: A 3? **ABU** g9 s7 =.

2646--Carex shortiana Dewey

Cyperaceae <Cariceae>: *Carex* <Shortianae> *shortiana*

This distinctive, large cespitose species occurs only on damp calcareous soils in east-central states, from mid-Atlantic to Ozarkian regions (FNA 23, K). In Ky. an apparent hybrid with *typhina* (= *X deamii* F.J. Herm.) was collected by C.W. Short from KENT (PH).

HAB g-9,10 ::? E 4. **ABU** g8 s8 -4.

2647--Carex jorii Bailey

Cyperaceae <Cariceae>: *Carex* <Glaucescentes> *joorii*

This large, cespitose, southeastern species occurs mostly in wetlands of the Coastal Plain, but it extends north locally into ponds on the Cumberland Plateau. Its less robust relative, *C. glaucescens* Ell., has been reported from Kentucky (RAB, BA), but there is no evidence of a collection (M, FNA 23, K).

HAB 2,3,6 ::? C 3. **ABU** g9 s2 -2.

2648--Carex flacca Schreber

Cyperaceae <Cariceae>: *Carex* <Scitae> *flacca* (*glauca*)

This alien has been promoted in horticulture as an ornamental, and it is also becoming naturalized from initial introduction in eastern Canada (FNA 23). A

coll. from NELS was recently det. by R.L. Naczi: M.E. Medley #78-031, 11 May 1978; Cedar Glade just west of Bardstown High School on north side of stream just north of Smith Avenue.

ALI EU. **HAB** 12,10,9 ::? E? 4? **ABU** +4.

2649--Carex buxbaumii Wahlenb.

Cyperaceae <Cariceae>: Carex <Racemosae> buxbaumii (fusca)

This widespread northern (circumboreal) species of seasonal wetlands has been collected in BALL (KY) by R. Athey in 1970; in CLIN by Naczi et al. (2002); and recently in BOON and LEWI by R. Cranfill (for NKY). There are also old reports of this species by Britton & Brown (1896), Small (1903), Mackenzie (1931) and others, but these may just be based on C.W. Short's ca. 1840 coll. (NY ex Meisner Herbarium) from "west of Ky.", which cannot be attributed to Ky.

HAB 9,6 C 4. **ABU** g10 s2 -4?

2650--Carex mitchelliana M.A. Curtis R

Cyperaceae <Cariceae>: Carex <Phacosystis> mitchelliana (crinita var. m.)

A coll. of *C. gynandra* from Ky. by C.W. Short (NY) was apparently misidentified as *C. mitchelliana* M.A. Curtis, leading to erroneous records from Ky. by Bruederle et al. (1989), Cr and FNA 23 (M). However, *mitchelliana* is expected in the state. It is a globally threatened species known mostly on the southeastern Coastal Plain, but extending north on the Cumberland Plateau to Scott Co., Tenn., adjacent to Ky. (Ch). It is close to *gynandra* but perigynia are ovoid (versus ovoid to ellipsoid) and papillose (versus smooth); achenes are not constricted (versus "variously constricted"); and pistillate scale apices are truncate (versus acuminate).

2651--Carex gynandra Schwein.

Cyperaceae <Cariceae>: Carex <Phacosystis> gynandra (crinita var. g.)

This close relative of *crinita* has a northeastern and Appalachian range, and may be typical of more acid sites. Hybrids are reportedly rare and sterile (FNA 23; and citations there). Perigynia are ovoid-ellipsoid (versus obovoid); apices of pistillate scale are acuminate (versus retuse); and sheaths are scabrous (versus glabrous). Some colls. need rechecking or may appear intermediate.

HAB 6,9 C 4. **ABU** g8 s8 -3.

2652--Carex crinita Lam. var. brevicrinis Fern.

Cyperaceae <Cariceae>: Carex <Phacosystis> crinita var. brevicrinis

This is a southeastern variety, found mostly on the Coastal Plain (FNA 23). Distinction from var. *crinita* is not clear in some cases, and there may be intermediate plants.

HAB 2,6,9 D 4. **ABU** g8 s7? -3.

2653--Carex crinita Lam. var. crinita

Cyperaceae <Cariceae>: Carex <Phacosystis> crinita var. c.

This is widespread in eastern North America, but partly replaced by var. *brevicrinis* on the southeastern Coastal Plain.

HAB 2,6,9 D 4. **ABU** g9 s9 -3.

2654--Carex stricta Lam.

Cyperaceae <Cariceae>: Carex <Phacosystis> stricta (var. s.)

Typical *stricta* is a widespread northeastern taxon of relatively acid swamps, seeps and boggy sites, without fresh alluvium. The coll. from CALL (WKY) is referable to var. *strictior* (Dewey) Carey, which appears somewhat transitional to *emoryi* and occurs more often in calcareous swamps (F). That segregate is not recognized in recent treatments, but variation may deserve further study; $2n = 66-72$ in *stricta*, sensu lato (FNA 23).

HAB 9,2,6 C 4. **ABU** g10 s4 -4.

2655--Carex emoryi Dewey

Cyperaceae <Cariceae>: Carex <Phacosystis> emoryi (*stricta* var. *elongata*)

This occurs mostly in the Great Plains and Midwest, with extension to southern New England. It has been confused with *stricta*, but has distinct cytology ($2n = 72$ versus mostly 68), morphology and habitats. It occurs in calcareous seeps and marshy shoals along streams and (especially in Ky.) rivers with relatively base-rich substrate (F, FNA 23). It tends to occur on the wetter downstream side (or back side) of cobble bars, where scouring is less intense. A large patch discovered in 1986 along Benson Creek (FRAN) appears to have been scoured out and lost after intense flooding during 1990-2010.

Compared to typical *stricta*, *emoryi* has a stoloniferous habit, forming extensive colonies (versus large dense stools). Its bladeless lower sheaths are not ladder-fibrillose and lack evident veins on the inner side (versus prominently fibrillose); they are often deeper purplish-red but lack spots on the inner side (versus spotted red-brown); and they have a prolonged convex apex (versus obtuse), forming sharp dormant shoots. Its ligules are as long as broad (versus longer). Its pistillate spikes are strongly overlapping (versus

more widely separated) and lack staminate tips (versus often staminate); perigynia are green-stramineous (versus pale brown-tawny). Differences in spikes and perigynia are less clearcut than the vegetative characters.

HAB 1 D 5. **ABU** g10 s6 -3.

2656--Carex torta Boott ex Tuckerman

Cyperaceae <Cariceae>: Carex <Phacosystis> torta

This occurs mostly in Appalachian regions, but extends west to the non-calcareous parts of the Interior Low Plateaus and to Ozarkian regions (FNA 23, K). In Ky. it is generally restricted to acid gravelly or sandy soils along scoured banks of small to medium-sized streams. The disjunct coll. from BOON (DOV) was made by R. Naczi (#8021) at the same location as prasina, in a seep along Gunpowder Creek.

HAB 1,4 B 4. **ABU** g9 s9 -1.

2657--Carex hyalinolepis Steud.

Cyperaceae <Cariceae>: Carex <Paludosae> hyalinolepis (lacustris var. laxiflora)

This tall colonial glaucous-leaved sedge is widespread from southeastern states to the southern Great Lakes region, but it is concentrated in the Mississippi Valley and west Gulf Coastal Plain (K).

HAB 9,6,3 E 4. **ABU** g9 s8 -4.

2658--Carex lacustris Willd. T

Cyperaceae <Cariceae>: Carex <Paludosae> lacustris (var. lacustris)

This northern species is a close relative of hyalinolepis that may occur in Ky. but verification is needed. It was reported by J from the Coastal Plain, and there may be a coll. from JEFF (MM for WKY). There are also records from close to Ky. in Ill., Ind. and Ohio (K).

2659--Carex aureolensis Steud.

Cyperaceae <Cariceae>: Carex <Squarrosae> aureolensis

This widespread southeastern species was described in 1855, but largely ignored for 150 years. It was first recorded from Ky. in FNA 23, and a coll. from FULT (MM for WKY) has been det. by R.L. Naczi: M.E. Medley #845-79 & 853-79, 12 Jun 1979; Bayou de Chien between Howel Rd and US 51, north bank at east end near Howel Rd. There is also a recent coll. from MCLE by J. Lempke (verified by JC). Colls. named frankii from western regions should be rechecked for aureolensis, which differs in its longer rhizomes,

more open inflorescences (generally with less robust spikes), and scales with broad hyaline margins in lower sections.

HAB 6 D 3. **ABU** g8 s2? -2?

2660--Carex frankii Kunth

Cyperaceae <Cariceae>: Carex <Squarrosae> frankii

This occurs mostly in east-central states from mid-Atlantic states to Ozarkian regions (FNA 23). It is generally replaced on the southeastern Coastal Plain by aureolensis, and some colls. from western regions of Ky. need to be rechecked for that species.

HAB f-9,6,2 D 5. **ABU** g10 s10 +1?

2661--Carex typhina Michx.

Cyperaceae <Cariceae>: Carex <Squarrosae> typhina (squarrosa var. t.)

This is close to squarrosa, and often confused. Both species are widespread across eastern states, typically on wet medium-acid soils, but typhina is concentrated in deeper swamps with less exposure to droughts or disturbances. In Ky. an apparent hybrid was collected by R. Naczi from LAUR (DOV).

C. typhina can be clearly distinguished from squarrosa (FNA 23) by its relatively short achenes ($l/w = 1.2-1.9$ versus $1.9-2.5$) and straight deciduous styles (versus sinuous, persistent). its perigynia are usually appressed-ascending (versus widely radiating to, at base, reflexed), often with slightly scabrous beaks (versus usually smooth). Pistillate portions of spikes are often more elongated (ca. 1-4.3 cm versus 1-2.5 cm), usually with an oblong shape (versus somewhat ovate); pistillate are blunt to acute (versus acute to awned). Plants tend to have broader leaves (usually 4-8 mm versus 3-5 mm), with a slightly bluish/grayish hue, and more spikes per stem (usually 2-4 versus 1-2).
HAB 6,9,4 C? 2. **ABU** g9 s9 -3.

2662--Carex squarrosa L.

Cyperaceae <Cariceae>: Carex <Squarrosae> squarrosa (var. s.)

See notes under typhina.

HAB 9,6 C 3. **ABU** g10 s10 -2.

2663--Carex hystericina Muhl. ex Willd.

Cyperaceae <Cariceae>: Carex <Vesicariae> hystericina

This widespread northern species has been verified with colls. from only two western counties: FULT and MCRA (MUR). There is also a coll. of C.W.

Short (at Univ. of Cincinnati or elsewhere) from Ky. (Short & Peter 1834; B, GI), which needs to be checked. However, reports from Appalachian regions (M) have been based on misidentified colls. of *lurida* or *lupulina*: BELL at KY (Anderson 1924); MCRE at MUR (Rogers 1941); ROCK at KY (F.T. McFarland in 1940). *C. hystericina* has been also been reported as far south as Tenn. (Ch) and Ga. (W).

HAB 9 D 5. **ABU** g10 s1 -6.

2664--*Carex comosa* Boott R

Cyperaceae <Cariceae>: *Carex* <Vesicariae> *comosa*

This close relative of *hystericina* is a widely scattered eastern species (also disjunct in northwestern states), but most concentrated in cool temperate regions north of Ky. It is not verified from Ky. but there are records from adjacent counties of w. Tenn. (Ch). There is a coll. of C.W. Short (NY) labeled Ky., but with no other data. The record from TRIG (Ellis et al. 1971) appears to have been based on a misidentified coll. of *lurida* (NCU). *C. comosa* is close to *hystericina*.

2665--*Carex vesicaria* L.

Cyperaceae <Cariceae>: *Carex* <Vesicariae> *vesicaria*

This is a widespread northern (circumboreal) species. As in other sedges of northern wetlands, it is speculated that occasional southern occurrences may result from dispersal by migrating waterfowl. The coll. from JEFF (KY) was made by C.W. Short in the 1830s on "Corn Island". In 2000, JC also found this species at the Blue Grass Army Depot (MADI).

HAB 7,4? D 5? **ABU** g10 s2 -4?

2666--*Carex lurida* Wahlenb.

Cyperaceae <Cariceae>: *Carex* <Vesicariae> *lurida* (var. l.)

This is a widespread eastern species, locally abundant on wet medium acid soils. See also notes under *baileyi*.

HAB 6,9 C 4. **ABU** g10 s10 -3.

2667--*Carex baileyi* Britt.

Cyperaceae <Cariceae>: *Carex* <Vesicariae> *baileyi* (*lurida* var. *gracilis*)

This largely Appalachian species is generally distinct from *lurida*, but several colls. are difficult to assign. Plants of *lurida* that are immature or depauperate, with unusually narrow spikes and leaves, are easily confused with *baileyi*. The western limits of *baileyi* remains uncertain; compare FNA 23 and K. In Ky.

there appear to be disjunct colls. from acid swamps and seeps in western regions (CALL, HICK, MUHL, NELS), but further study is needed.

The best characters for distinguishing *baileyi* from *lurida* (FNA 23) are its narrower spikes (usually 9-13 mm versus 15-22 mm), which tend to be relatively elongated (l/w mostly = 2-5 versus 1-3), and its narrower widest leaves (usually 2.4-4 mm versus 4.5-13 mm). Its perigynia are usually shorter (ca. 4.8-6.6 mm versus 6.5-10.8 mm) with relatively long beaks (0.7-1.3 times body versus 0.7-0.9 times); but these are less reliable differences.

HAB 6,9 B 4. **ABU** g8 s7 -1.

2668--*Carex gigantea* Rudge

Cyperaceae <Cariceae>: *Carex* <Lupulinae> *gigantea*

This easily overlooked southeastern species has a somewhat fragmented range, and plants are usually associated with natural wetlands of high quality. In addition to the few Ky. records, *gigantea* was recently found in se. Ohio (R. Gardner, pers. comm.), and it should be searched for further within the Ohio Valley.

HAB 4,6,9 C 4. **ABU** g8 s3 -4.

2669--*Carex louisianica* Bailey

Cyperaceae <Cariceae>: *Carex* <Lupulinae> *louisianica*

This southeastern species occurs in wet woods on alluvial terraces, typically with more shade than other *Lupulinae* in Ky.

HAB 6,9 D 2. **ABU** g9 s8 -4.

2670--*Carex lupulina* Muhl. ex Willd.

Cyperaceae <Cariceae>: *Carex* <Lupulinae> *lupulina* (halei)

This is widespread in thin swampy woods and marshes of eastern North America. A coll. from HARD (KY) is referable to var. *pedunculata* Gray, which is not recognized in recent treatments but seems transitional to *lupuliformis*; see notes under that species.

HAB 9,6,2 D 4. **ABU** g10 s10 -3.

2671--*Carex lupuliformis* Sartwell ex Dewey

Cyperaceae <Cariceae>: *Carex* <Lupulinae> *lupuliformis*

This has a rather fragmented range, centered in east-central states and concentrated in eutrophic calcareous habitats that have become much reduced by conversion to farmland. It is an uncommon species that is close to, and

often confused with, the more widespread eastern species, *lupulina*; some colls. may be intermediate.

C. lupuliformis can appear somewhat transitional from *lupulina* to the southern species, *gigantea*. Compared to *lupulina*, its achenes have distinctly pointed or knobbed angles (versus smoothly curved), and are usually 2.4-3.4 mm wide (versus 1.7-2.6 mm), often almost as wide as long (versus clearly longer than wide). Also, perigynia tend to be more spreading (versus ascending), though not perpendicular to the rachis as in *gigantea*.

HAB 9,6,2 E 4? **ABU** g8 s7 -4.

2672--*Carex intumescens* Rudge

Cyperaceae <Cariceae>: *Carex* <Lupulinae> *intumescens*

This is widespread in most of North America (K), but it is uncommon to absent in much of the Ohio Valley and in mid-western states (somewhat complementary to *grayi*). It typically occurs on seasonally wet acid soils, including streamhead seeps. The coll. from GREE (EKY) has pubescent perigynia, like *grayii*, but in other characters it seems to match *intumescens* (as det. by R. Naczi).

Some plants on the Cumberland Plateau of Ky. and Tenn. may be a distinct segregate, with spikes that have relatively few perigynia, on long stems that decline or droop, with relatively narrow leaves (D. Estes & A. Floden, pers. comm.). Such plants have been collected from BELL, HARL, LAUR, LETC, JACK, MCRE, POWE, PULA, RUSS and WOLF (EKY).

HAB 6,9 B 3. **ABU** g10 s9 -3.

2673--*Carex grayi* Carey

Cyperaceae <Cariceae>: *Carex* <Lupulinae> *grayi* (*intumescens* var. *globularis*)

This occurs along rivers and streams on fertile soils, mostly in east-central states from mid-Atlantic to mid-western states. It is rare to absent in much of the Appalachian region and on the southeastern Coastal Plain. Most colls. from Ky. (perhaps all) are referable to the relatively southwestern var. *hispidula* Gray, but that taxon is not recognized in recent treatments (FNA 23).

HAB 4,6 D 3. **ABU** g9 s8 -4.

2674--*Carex praegracilis* W. Boott

Cyperaceae <Cariceae>: *Carex* <Divisae> *praegracilis*

This western species of alkaline sites has spread into northeastern states mostly along salted interstate highways. The only record is a recent coll. of A. Reznicek (pers. comm.) from along Interstate 75 near Corbin in WHIT (MICH, NK).

ALI W. **HAB** R-10 ::? E 5. **ABU** +4.

2675--*Carex socialis* Mohlenbrock & Schwegm.

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *socialis*

This was described by Mohlenbrock & Schwegman (1969) from s. Ill. It is locally common in lowland woods on seasonally wet, fertile clayey soils of the central Mississippi and lower Ohio Valleys (see also: McKinney et al. 2000). *C. socialis* can easily be confused with *radiata* or *rosea*, and is probably more widespread than colls. indicate. Its perigynia are similar to *radiata* but more elongated (l/w = 3-5 versus 1.5-3); its largest leaves tend to be wider (1.5-2.2 mm versus 1.3-1.9); and it produces conspicuous rhizomes up to 6 cm long (versus more or less caespitose). Hybrids have been suspected but not confirmed; 2n = 58 in both species (FNA 23).

HAB 6,9,4 D 2. **ABU** g7 s5 -3.

2676--*Carex radiata* (Wahlenb.) Small

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *radiata* (*rosea* var. *ra.*)

This widespread northeastern species is difficult to distinguish from *rosea* in some cases, especially with immature specimens. *C. radiata* has relatively straight stigmas except for the basal reflex (versus clearly coiled); its perigynia have broad subtruncate bases (versus cuneate to rounded), with achenes well above the spongy bases (versus subsessile), and they tend to reflex when ripe; its lowest bracts are relatively short, on average (Cr, FNA 23). *C. radiata* is typical of seasonally wet, medium acid soils. It is virtually absent from the largely calcareous Bluegrass region, but it does occur locally on relatively siliceous stream terraces.

HAB 6,9 C 2. **ABU** g9 s9 -3.

2677--*Carex rosea* Schkuhr ex Willd.

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *rosea* (*convoluta*)

This has a widespread eastern range. See notes under *appalachica*, *radiata* and *socialis*.

HAB 7,5,11 D 2. **ABU** g10 s10 -2.

2678--*Carex appalachica* J. Webber & P.W. Ball

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *appalachica* ("*radiata*")

This Appalachian taxon is close to *rosea* ($2n = 52$ in both), and colls. should be rechecked, especially in more western regions. The clearest difference in *appalachica* is its relatively narrow widest leaves (0.9-1.5 mm versus 1.8-2.6 mm). In some cases narrower culm bases (0.7-1.4 mm versus 1.5-2.2 mm) and smaller perigynia (2-3.4 x 0.8-1.3 mm versus 2.6-4 x 1.1-1.8 mm) also can be useful (FNA 23). Lower bracts are often longer, up to 11 cm (versus 6 cm). Based on leaf width alone, this species is also easily confused with *radiata*.
HAB 11,7,5 B? 3? **ABU** g8 s8? -1.

2679--*Carex retroflexa* Muhl. ex Willd.

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *retroflexa* (var. r.)
This is a widespread eastern species of dry woodlands; $2n = 40$. See notes under *texasensis*, which has often been confused.
HAB 7,11,10 C 3? **ABU** g9 s9 -2.

2680--*Carex texensis* (Torr.) Bailey

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *texensis* (*retroflexa* var. t.)
This widely scattered southeastern species is most common in roadsides and other mowed areas on fertile soils, including lawns; it may have spread greatly after settlement. Some colls. from Ky. are immature and not easily distinguished from typical *retroflexa*. *C. texensis* differs in its perigynia averaging 1-1.3 mm wide (versus 1.4-1.8 mm), with l/w usually 2.3-3.1 (versus 1.5-2.3), and the basal spongy portion < 1.1 mm long (versus 1.1 mm or more). Its widest leaves are narrower on average (ca. 1-2.5 mm versus 1.4-3.4 mm), but this is not a reliable character; see Downer & Hyatt (2003) and FNA 23.

HAB R-10,8 D 6? **ABU** g9 s9 +2?

2681--*Carex cephalophora* Muhl. ex Willd.

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *cephalophora* (var. c.)
This is widespread in dry woods across eastern North America; $2n = 48$. See notes under *mesochorea* and *leavenworthii*, which are often confused.
HAB 11,7 C 2? **ABU** g10 s10 -2.

2682--*Carex mesochorea* Mackenzie

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *mesochorea* (*cephalophora* var. m.)
This robust relative of *cephalophora* is typical of grassy open areas, often in pastures or lawns on relatively damp fertile soil; *cephalophora* is largely restricted to woods, especially subxeric types. Distinction of these two species

is difficult with some colls., especially when immature, but careful study of good material shows that they are clearly distinct (F, FNA 23).

Compared to *cephalophora*, pistillate scale bodies in *mesochorea* are 2-3-3.1 mm long (versus 1-1.8 mm), with bodies ca. 70-100% as long as bodies of perigynia (versus 40-60%), usually with three distinct green nerves (versus only the midnerve distinct). Perigynia are 3-4.1 x 1.7-2.6 mm (versus 2-3.2 x 1.4-2 mm). Spikes are relatively large (ca. 1 cm wide versus 0.5-1 cm), on culms up to 60-100 cm tall (versus usually no more than 60 cm), usually well above the leaves (versus about as tall or little exerted), but those are less reliable characters.

HAB g-10 D 5. **ABU** g9 s9 -1?

2683--*Carex leavenworthii* Dewey

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *leavenworthii*
This is widespread in eastern states, like *cephalophora*, but it tends to occur in more open habitats. *C. leavenworthii* is often confused with *cephalophora*, but its perigynia have bodies widest at 25-40% from base (versus 40-55%). Also, the beaks are shorter (0.3-0.8 mm versus 0.7-1.1 mm), with shorter teeth (0.1-0.3 mm versus 0.3-0.5 mm) and generally less serrulation.

HAB 10,11,7 D 4? **ABU** g9 s9 -2?

2684--*Carex muhlenbergii* Schkuhr ex Willd.

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *muhlenbergii*
Typical *muhlenbergii* is a widespread eastern sedge, typical of thin woods on rather dry acid soils, often with sandy substrates. Records mapped here are probably accurate to species, but only tentative to variety. More robust specimens of grassy woods and openings have been referred by some collectors to the southwestern species, *austrina*, or the northwestern species, *gravida* (M), but most of these have been redetermined as *muhlenbergii* by A. Reznicek, R. Naczi, L. McKinney or others. There has also been confusion with *aggregata*.

Spelling as "*muehlenbergii*" is incorrect (R. Naczi, pers. comm.).

HAB 11,7,10 C 3. **ABU** g10 s9 -2.

2685--*Carex muhlenbergii* Schkuhr ex Willd. var. *enervis* Boott T

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *muhlenbergii* var. *enervis* (*C. plana*)
This is not easily distinguished from typical *muhlenbergii*, and it has also been confused with *aggregata*. Colls. that have been named var. *enervis* in Ky. have

been tentatively assigned here to either of those two species. MacKenzie (1940) considered these plants a species (= *C. plana* MacKenzie) typical of calcareous soils, but F noted typical *muhlenbergii* "passing insensibly into the relatively unimportant var. *enervis*." FNA 23 indicates that the perigynia (2.7-3.1 mm versus 3-4.2 mm) and scales (2-2.5 mm versus 2.5-3.6) are relatively short and veinless adaxially (versus often veined in typical plants). It may be typical of richer soils, sometimes appearing in pastures and lawns, as does *aggregata*.

HAB 7,10? D? 4? **ABU** g9 s9 -2.

2686--*Carex austrina* Mackenzie R

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *austrina* (*muhlenbergii* var. *australis*)

This occurs mostly in the Ozark region and lower Mississippi Valley. Although reported from Ky. in FNA 23, verified colls. have not yet been seen. Cranfill's (1991) report was apparently based on misidentified *muhlenbergii*. *C. austrina* may still be expected in Ky., at least as an adventive (R. Naczi, pers. comm.). Disjunct plants that appear adventive do occur in Ohio (pers. comm. from R. Gardner, Ohio Division of Natural Areas) and in other eastern states (K, W).

Compared to *muhlenbergii*, the pistillate scales of *austrina* are wider (at least 2 mm versus often less than 2 mm), almost covering perigynia (versus much less wide); awns are longer (1.5-4 mm versus usually 0-1.5 mm), and culms are more divergent (at ca. 45 degrees versus almost upright).

2687--*Carex sparganioides* Muhl. ex Willd.

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *sparganioides* (var. *s.*)

This is close to *aggregata*; see notes under that name. Some immature specimens are difficult to distinguish. Both are widespread in eastern states, and centered in midwestern regions on base-rich soils, but *sparganioides* is largely restricted to woodland (versus grassland).

HAB 7,10,6 D 3. **ABU** g9 s9 -2.

2688--*Carex cephaloidea* (Dewey) Dewey R

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *cephaloidea* (*sparganioides* var. *c.*)

This occurs in northeastern woodlands on base-rich soils, with records as far south as s. Ill. and c. Ind. (PL). It is close to *sparganioides*, but differs in its condensed spikes (with lower internodes ca. 0.5-1 cm versus 2-3 cm), and

more obscure features (F, FNA 23); $2n = 50$ (versus 46, 48). There is a verified coll. by C.E. Mueller, now at MO ("ex herb Arthur D. Pease, Wilson, New York"); but it is labeled just "Louisville, Ky. 1889" and that provenance may be doubted. There have also been unverified reports, including various synonyms, from WARR (Pr in addenda), perhaps FAYE (Short & Peter 1835; Anderson 1924), and elsewhere. However, the coll. named *C. muricata* L. var. *cephaloidea* Dewey by C.W. Short at PH was det. by K. Mackenzie as *C. laevivaginata*.

HAB 7? D? 3? **ABU** g8? s2? -3?

2689--*Carex aggregata* Mackenzie

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *aggregata* (*sparganioides* var. *a.*)

This is a distinct species, widespread in open woods and fields on damp fertile soils, but it can appear intermediate between *sparganioides* and either *gravida* or *muhlenbergii* (especially plants that have been called var. *enervis*); further review of colls. is needed.

C. aggregata differs from *muhlenbergii* in its perigynia with consistently ovate-lanceolate bodies (versus often suborbicular) and relatively long beaks (1/3-1/2 of length versus 1/4-1/3); its somewhat looser sheaths, the backs usually mottled and more green-striped, the front usually more deeply concave at the summit and less often cross-puckered; and its leaves wider on average.

C. aggregata differs from *sparganioides* in the fronts of its sheaths, with firm yellow-brown summits (versus fragile, whitish) and often reddish-dotted surfaces (as in *gravida*); well-developed leaves are narrower (ca. 3-5 mm wide versus 5-10 mm); also (as in *gravida*), its spikes tend to be more condensed, with generally larger scales, perigynia and anthers. As in *sparganioides*, the spikes of *aggregata* are sometimes slightly compound at the base, which has then led to confusion with species in section *Vulpinae* (F, Cr, FNA 23).

HAB g-10,8,7 D 5. **ABU** g9 s9 -1?

2690--*Carex gravida* Bailey

Cyperaceae <Cariceae>: *Carex* <Phaestoglochin> *gravida* (var. *g.*)

This has been reported from Ky. several times (e.g. Anderson 1924; Cr, M), but most accessible colls. have been reassigned to robust forms of *muhlenbergii* or *aggregata*. Var. *gravida* is widespread in midwestern regions and the northern Great Plains, but perhaps only adventive further east (see

also W). There is a recent coll. of typical *gravida* from CAMP (KNK): Naczi et al., CGE #45, 6 Jun 1996, powerline row, Highland Heights, just S of Tessener Rd, just E of Three Mile Rd. A coll. has also been reported from TRIG (BEREA) along a creek in restored prairie of Land-Between-the-Lakes (Thompson & Poindexter 2006). The few Ky. records of the southwestern var. *lunelliana* (Mackenzie.) F.J. Herm. are probably erroneous (M).

C. gravida often appears most similar to *aggregata*, but differs in its sheaths, with fronts pale and fragile at summits, and with backs not white-spotted (FNA 23). Also, leaves are often wider and perigynia often larger, with scales more or less equal to perigynia (versus shorter).

ALI w. **HAB** 10? C? 4? **ABU** g9 s2 -1?

2691--*Carex triangularis* Boeckl.

Cyperaceae <Cariceae>: *Carex* <Multiflorae> *triangularis* (*vulpinoidea* var. t.) This is centered in the lower Mississippi Valley. Colls. from HARD (UC, ?KY; see Cranfill & Thieret 1981) and ROWA (MDKY) have been verified but are now mislaid or awaiting accession, and should be rechecked. The more western records from CARL, GRAV and MCRA are reliable (EKY, WKY). *C. triangularis* differs from other Multiflorae in its relatively short abrupt beaks on broad perigynia (ca. 2.5-3 mm wide versus 1.3-2.6 mm), which have "crystalline inclusions" that become reddish when mature; see also F and FNA 23.

HAB 6,9 ::? D? 4. **ABU** g10 s3? -4?

2692--*Carex vulpinoidea* Michx.

Cyperaceae <Cariceae>: *Carex* <Multiflorae> *vulpinoidea* (var. v.) This is widespread in wetlands across temperate North America; 2n = 52.

HAB f-9 ::? D 5. **ABU** g10 s10 +1?

2693--*Carex annectans* (Bickn.) Bickn. var. *annectans*

Cyperaceae <Cariceae>: *Carex* <Multiflorae> *annectans* var. a. (*vulpinoidea* var. *ambigua*)

Separation of this eastern species from *vulpinoidea* has been based on various characters, with somewhat inconsistent treatment (Cr, FNA 23, W). But it is clearly distinct in Ky., with concentration on drier ground.

HAB F-10 ::? D? 5. **ABU** g9 s9 -1?

2694--*Carex annectans* (Bickn.) Bickn. var. *xanthocarpa* (Kükenth.)

Wieg.

Cyperaceae <Cariceae>: *Carex* <Multiflorae> *annectans* var. *xanthocarpa* This relatively western taxon may not be consistently distinguishable from typical *annectans*, and it is combined in some recent treatments (FNA 23). Several colls. from Ky. are hard to assign.

HAB F-10 ::? D? 5. **ABU** g9 s8 -1?

2695--*Carex decomposita* Muhl.

Cyperaceae <Cariceae>: *Carex* <Heleoglochin> *decomposita* This widely scattered southeastern species is largely restricted to old ponds and sloughs, where it typically grows on rotten logs or emergent tree bases; 2n = 60, 64, 66.

HAB 3,2,9 C 3. **ABU** g7 s4 -3.

2696--*Carex prairea* Dewey ex Wood R

Cyperaceae <Cariceae>: *Carex* <Heleoglochin> *prairea* (*diandra* var. *ramosa*) There are colls. of this northeastern species by C.W Short (NY, PH) that may be from Ky. (M). The coll. at PH is labeled "near *Cincinnati*" and it is may be from Hamilton Co., Ohio (see also PL). Within the Ohio Valley, *prairea* is virtually restricted to calcareous wetlands in glaciated regions.

2697--*Carex laevivaginata* (Kükenth.) Mackenzie

Cyperaceae <Cariceae>: *Carex* <Vulpinae> *laevivaginata* This east North American species (2n = 46) is distinct but close to *stipata* (2n = 48, 52), which occurs in similar habitat but across much of North America and East Asia. *C. laevivaginata* differs in the adaxial side of its leaf sheaths, which are yellowish-thickened at the apex (versus thin and friable) and flat below the apex (versus rugose-puckered). Also, leaf blades are papillose around stomata (versus not), when viewed at x 25 (FNA 23).

HAB 9,6 C 4. **ABU** g9 s8 -3.

2698--*Carex crus-corvi* Shuttlw. ex Kunze

Cyperaceae <Cariceae>: *Carex* <Vulpinae> *crus-corvi* This is widely scattered in eastern states, but most frequent on relatively base-rich soils in the lower Mississippi River watershed (FNA 23; W). It is close to *stipata* and sometimes confused (2n = 52 in both); see notes under *stipata* var. *maxima*. It differs in its long-beaked perigynia (up to 6-8 mm versus 4-6 mm), with clearly distended bases when mature; also, sheath fronts are smooth and often finely red-dotted (versus rugose but not red-dotted). Compared to typical *stipata*, *crus-corvi* is relatively robust and distinctly glaucous.

HAB 9,6 D 3. **ABU** g9 s8 -3.

2699--*Carex stipata* Muhl. ex Willd. var. *maxima* Chapman

Cyperaceae <Cariceae>: *Carex* <Vulpinae> *stipata* var. *maxima* (uberior)
This relatively robust, glaucous southern variety appears somewhat intermediate between typical *stipata* and *crus-corvi* (FNA 23); see notes under *crus-corvi*.

HAB 9,6 B 4. **ABU** g9 s5? -3.

2700--*Carex stipata* Muhl. ex Willd. var. *stipata*

Cyperaceae <Cariceae>: *Carex* <Vulpinae> *stipata* var. *s*.
See notes under *crus-corvi* and *laevivaginata*, which are sometimes confused.

HAB 9,6 C 4. **ABU** g10 s9 -3.

2701--*Carex oklahomensis* Mackenzie

Cyperaceae <Cariceae>: *Carex* <Vulpinae> *oklahomensis* (*stipata* var. *o*.)
This southwestern species appears to have spread into northern and eastern states during recent decades (FNA 23). It has been confirmed in Ky. by R.F. Naczi, based on colls. of R. Athey and J. Grubbs from CALL, MARS and MCRA (MUR), which were previously named *stipata*. It may also be confused with *conjuncta*.

ALI S. HAB 9,6 D 4. **ABU** g8 s4? -3?

2702--*Carex conjuncta* Boott

Cyperaceae <Cariceae>: *Carex* <Vulpinae> *conjuncta*
This is locally common in open areas on wet fertile soils in east-central states. It has been confused with *aggregata* or *sparganioides*, which can sometimes have slightly compound spikes (F).

HAB G-10,9,7,6 E 5. **ABU** g8 s8 -4.

2703--*Carex alopecoidea* Tuckerman R

Cyperaceae <Cariceae>: *Carex* <Vulpinae> *alopecoidea*
This distinct northern species is unlikely to occur in Ky. (R. Naczi and A. Reznicek, pers. comm.). It was mapped in the state by FNA 23, but colls. have not been seen or verified. Colls. have been reported from BULL (KY--misaid?), MADI (BEREA--in processing?) and MORG (sent to MICH?). *C. alopecoidea* (2n = 68) is close to *conjuncta*, but differs in its sheaths, with smooth fronts and with faint or absent abaxial veins (FNA 23). Also, it sometimes has a simpler non-compound inflorescence as in section *Phaestoglochyn*.

2704--*Carex atlantica* Bailey

Cyperaceae <Cariceae>: *Carex* <Stellulatae> *atlantica* (var. *a.**; incomperta)
This is widespread across eastern North America, except for most of the midwest (FNA 23, K). A few colls. from Ky. suggest intergradation with *howei*, *seorsa* or other species. Cr concluded that most members of the section *Stellulatae* are "more or less confluent" in eastern North America. A. Reznicek has insisted that they are identifiable but "it is best to examine the third or fourth perigynium above the staminate part of the spikes" (FNA 23).

HAB 6,9 B 4. **ABU** g9 s8 -2.

2705--*Carex howei* Mackenzie

Cyperaceae <Cariceae>: *Carex* <Stellulatae> *howei* (*atlantica* var. *capillacea**)
This southeastern taxon can be difficult to distinguish from the more widespread *atlantica* in some cases. It is often combined as a subspecies or variety, but W has maintained it as a generally distinct species. In addition to the typically narrower leaves of *howei*, its spikes and perigynia tend to have smaller dimensions (Cr, FNA 23). There has also been confusion with *seorsa*. In Ky. *howei* appears to be rare and restricted to well-developed acid seeps with high floristic interest.

HAB 9,6 B 4. **ABU** g9 s4 -1.

2706--*Carex interior* Bailey T

Cyperaceae <Cariceae>: *Carex* <Stellulatae> *interior*
This is widespread in northern and western regions, especially on calcareous soils. It has been reported from all surrounding states (PL), including nearby counties in Ohio and W.Va., but there are only a few tentative reports of colls. from Ky. (M). Colls. filed under *atlantica* (or *howei*) should be reexamined for possible records. The more northern, circumboreal relative *C. echinata* Murray (= *C. angustior* Dewey) might also be expected, since it extends south along the Blue Ridge to Tenn. and N.C. in boggy places (Ch, W).

2707--*Carex seorsa* Howe

Cyperaceae <Cariceae>: *Carex* <Stellulatae> *seorsa*
This northeastern species of thin woods on wet acid soils was recently discovered in eastern and western Ky. (Ousley & Risk 1998, McKinney et al. 2000, Naczi et al. 2002). At the Hog Hollow seeps in BATH (MDKY), there also appear to be sterile hybrids with *atlantica*.

HAB 6 A 3. **ABU** g8 s2 -3?

2708--*Carex bromoides* Schkuhr ex Willd.

Cyperaceae <Cariceae>: *Carex* <Deweyanae> bromoides
This variable species (2n = 60-68) is widely scattered across eastern North America, but in Ky. it is largely restricted to wet acid soils in streamhead seeps and along banks of small streams within Appalachian regions. A mysterious old record from FAYE (KY-Agr.) is excluded here (Anderson 1924); the coll. has not been located.

HAB 6 B 3. **ABU** g9? s7 -2.

2709--*Carex tribuloides* Wahlenb. var. tribuloides

Cyperaceae <Cariceae>: *Carex* <Ovales> tribuloides var. t.
Typical plants of this widespread eastern species have thin elongated perigynia (l/w = 3-5), appressed-ascending in overlapping spikes; 2n = 70. As in cristatella (and projecta), there are frequent vegetative shoots with many leaves, the blades often relatively broad and the sheaths somewhat expanded and winged at apex. In tribuloides, these shoots often become decumbent, root and spread to form extensive open stands. Such growth-form is generally rare in Ovales, but often occurs in albulotescens, projecta and longii (FNA 23).

HAB 9,6 C 5. **ABU** g10 s9 -2?

2710--*Carex tribuloides* Wahlenb. var. sangamonensis Clokey

Cyperaceae <Cariceae>: *Carex* <Ovales> tribuloides var. sangamonensis
This is centered in the lower Mississippi Valley (FNA 23). Compared to typical tribuloides, its perigynia are less elongated (with l/w = 2.2-3 versus 3-5). Also, it tends to have a more elongated inflorescence (with separated spikes versus clustered), and narrower leaves (ca. 2-4.5 mm versus 3-7 mm). It mostly occurs in wooded seeps and swamps (versus more open habitats). Although some of these plants were previously identified in Ky. as the northern species, projecta (= *C. tribuloides* var. *reducta* Bailey), the plants mapped here are now considered closer to typical tribuloides or cristatella (Hipp et al. 2007; A.A. Reznicek, pers. comm.). See also notes under projecta.

HAB 6,9 C 3. **ABU** g9? s9? -3.

2711--*Carex projecta* Mackenzie T

Cyperaceae <Cariceae>: *Carex* <Ovales> projecta (tribuloides var. *reducta*)
This northeastern species has been reported from Ky. by Campbell et al. (1992) and others from slightly open seepy or swampy woods, but perhaps based only on misidentified variants of tribuloides. *C. projecta* appears somewhat intermediate between tribuloides and cristatella (FNA 23), but can

be distinguished from both by its inflorescence flexible or nodding, and its perigynia usually less numerous and more spreading; 2n = 64 (versus 70).

There are no clear records of projecta from Ky., though some plants mapped here under tribuloides var. sangamonensis are hard to distinguish, especially colls. with slightly nodding spikes and relatively broad yellowish-green leaves. Such colls. are mostly from eastern regions of the state, along smaller streams and seeps with acid soils. Similar plants are known from Tenn. (e.g. at MO: R. Kral #52,740 from Cheatham Co.).

2712--*Carex cristatella* Britt.

Cyperaceae <Cariceae>: *Carex* <Ovales> cristatella
This has a northeastern to midwestern range, and is rare or unknown across most of s. Ky. and Tenn. (Ch). There has been some confusion with tribuloides, which shares narrow perigynia, winged sheaths, broad blades, robust vegetative shoots, and 2n = 70 (FNA 23). *C. cristatella* has distinctively globose spikes with lower perigynia spreading to recurved.

HAB G-9,10 D? 5. **ABU** g9 s8 -2?

2713--*Carex scoparia* Schkuhr ex Willd. var. scoparia

Cyperaceae <Cariceae>: *Carex* <Ovales> scoparia var. s.
This is a variable species with a broad northern range. The coll. from CART (MDKY) may be referable to var. *condensa* Fern., which is not recognized in recent treatments, but has been reported widely from northeastern regions (F). Sterile hybrids with *alata*, *straminea* and other species are documented in various states (FNA 23).

HAB 9,6 B 3. **ABU** g10 s8 -3.

2714--*Carex scoparia* Schkuhr ex Willd. var. moniliformis Tuckerman

Cyperaceae <Cariceae>: *Carex* <Ovales> scoparia var. moniliformis
The taxon seems to merit more than forma status, as treated in F. It occurs across most of the range of the species, but with less southern extension. Although locally distinct in Appalachian Ky., intermediates are known in other states (e.g. colls. at DOV). A. Reznicek, R. Naczi (pers. comm.) and others doubt the taxonomic significance of congestion versus extension within the inflorescences of scoparia (as in tribuloides).

HAB 9,6 B 4. **ABU** g9? s5? -3.

2715--*Carex muskingumensis* Schwein.

Cyperaceae <Cariceae>: *Carex* <Ovales> muskingumensis

This distinctive sedge has larger spikes and larger perigynia than other *Ovales* in Ky. It occurs in swampy woods and thickets of midwestern regions, especially glacial plains south of the Great Lakes; $2n = 80$.

HAB 9,6 D 4. **ABU** g7 s8 -3.

2716--*Carex normalis* Mackenzie

Cyperaceae <Cariceae>: *Carex* <Ovales> *normalis* (mirabilis)

This widespread, variable eastern species can be easily confused with several other species; see notes under *molesta*, *brevior* and *tenera*. Its identification can be complex with existing keys (e.g. FNA 23). Typical *normalis* has greenish perigynia and relatively broad leaves (2.5-6.5 mm wide), with sheaths "conspicuously green-veined adaxially nearly to collar" (appearing mottled against the whitish interveinal tissue). However, these characters are not clear in some colls. from Ky. *C. normalis* shares the same chromosome number with closely related species ($2n = 68$), and it is possible that hybrids occur.

HAB 7,8,10 D 3. **ABU** g9 s8 -3.

2717--*Carex molesta* Mackenzie ex Bright

Cyperaceae <Cariceae>: *Carex* <Ovales> *molesta*

Variation in this largely midwestern, somewhat weedy species needs careful attention; $2n = 68$ or 70 . Although generally accepted as distinct (FNA 23), it has been confused or combined with *normalis* and *brevior*, with some suggestion of hybrid origin (Gl, Cr). Several colls. referred here to *molesta* have relatively narrow perigynia (resembling *normalis*), in contrast to older published descriptions. In Ky. *molesta* is common on uplands with damp or compacted clay soils, especially in abandoned pastures or hayfields of the Bluegrass region, whereas *normalis* occurs in more mesic, shady habitats.

Compared to *normalis*, *molesta* has perigynia that tend to be relatively broad (elliptic to suborbicular versus ovate), with wider marginal wings (0.4-0.8 mm versus 0.25-0.45 mm); they become pale brown when mature, as do the scales (versus remaining green and white), and adaxial surfaces have less distinct veins (0-6 versus 4-7). Also, its inflorescences tend to be more congested (with proximal internodes 1.5-6 mm versus 3.5-10 mm); leaves tend to have narrower blades (ca. 1.5-4 mm versus 2.5-6 mm); sheaths are more uniformly greenish to stramineous (versus slightly mottled with green veins), and have concave summits (versus truncate).

HAB G-10,9,7 E 5. **ABU** g9 s8 -1?

2718--*Carex molestiformis* Reznicek & Rothrock

Cyperaceae <Cariceae>: *Carex* <Ovales> *molestiformis*

This species was recently described, and occurs in east-central states from Va. to Okl. (FNA 23). Initial Ky. records are colls. of R. Naczi from CUMB and ROCK (DOV). Also, there is a coll. from BARR (EKY): C.J. Lapham #355 with J. Campbell & Z. Murrell, Rt 31E near Edmonson Co. line. *C. molestiformis* has been called the "southwestern form" of *molesta*, differing in its larger, fewer perigynia, and chromosome number ($2n = 74$).

HAB G-9,10? D? 5? **ABU** g8? s5? -2?

2719--*Carex tenera* Dewey

Cyperaceae <Cariceae>: *Carex* <Ovales> *tenera* (var. t., "*C. straminea*")

This is a widespread, variable northern species, with only scattered reports from Ky., several of which have been erroneous. *C. tenera* ($2n = 52, 54, 56$) is easily confused with *normalis*, *scoparia* or other species; see FNA 23 for the complete complex key. A few colls. from Ky. appear to be intermediate between *tenera* and other taxa.

HAB 9,6 C? 4. **ABU** g9 s5? -4?

2720--*Carex reniformis* (Bailey) Small

Cyperaceae <Cariceae>: *Carex* <Ovales> *reniformis*

This distinct species is close to *brevior*, but with a more southern range, mostly on the Coastal Plain in swampy woods; $2n = 80$. The only record from Ky. is a coll. from CALL (MUR), det. by A. Reznicek (see also, McKinney et al. 2000): J. Grubbs #1366, 23 May 1989, Shannon Creek embayment, Fort Heiman, wooded floodplain, dense canopy.

HAB 3,6,9? C? 3? **ABU** g8 s2 -3.

2721--*Carex brevior* (Dewey) Mackenzie

Cyperaceae <Cariceae>: *Carex* <Ovales> *brevior* (festucea/straminea var. b.)

This is a widespread, variable northern and western species; $2n = 48$ to 68 (FNA 23). It is close to the southeastern *reniformis* (mostly on the Coastal Plain), the largely south-central *festucea*, and the largely midwestern *molesta*. There has been considerable confusion with those species and others. *C. brevior* is generally reported to occur on relatively dry soils (at least in the summer), somewhat like *molesta* in the Bluegrass region.

HAB 10,7 D 4. **ABU** g10 s6? -2?

2722--*Carex festucea* Schkuhr ex Willd.

Cyperaceae <Cariceae>: *Carex* <Ovales> *festucacea* (var. f., "straminea")
This widespread species of south-central states has often been confused with *brevior*, *normalis* or other species; $2n = 68$ or 70 . Some colls. need to be rechecked. A few colls. from FAYE and MADY (KY) are atypical (see also annotations of A.A. Reznicek), and they have suggested transitions to *brevior* or *molesta*; see notes under those species and FNA 23.
HAB f-9 C 5. **ABU** g9 s9 -2?

2723--*Carex longii* Mackenzie

Cyperaceae <Cariceae>: *Carex* <Ovales> *longii* ("albolutescens")
This is similar to *albolutescens* in its obovate perigynia, but clearly a distinct species; $2n = 58$ or 62 . It also resembles *brevior* and *festucacea*. There has been much confusion among these taxa (FNA 23). *C. longii* differs from *albolutescens* in its straight (versus laterally sinuous) style bases, the broadly triangular (versus narrow) beaks on its appressed-ascending (versus spreading) perigynia, and its obtuse (versus acute) pistillate scales. It often occurs in more open habitats, and is more frequent in southeastern regions. Although widely scattered across eastern states, it seems generally uncommon except on the Coastal Plain from Tex. to Fla. (PL).
HAB 9? C? 5? **ABU** g9? s4? -2?

2724--*Carex albolutescens* Schwein.

Cyperaceae <Cariceae>: *Carex* <Ovales> *albolutescens* ("straminea")
This is a relatively distinct species; $2n = 66$ (FNA 23). It is widespread in wet woods or thickets across Ky. and other south-central states. A coll. from PULA (DOV) is unusually robust.
HAB 6,9 C? 4? **ABU** g9 s9 -2.

2725--*Carex alata* Torr.

Cyperaceae <Cariceae>: *Carex* <Ovales> *alata*
This species is closely related to the more northern *straminea*, with the same chromosome number; $2n = 74$. *C. alata* has a wide south-central range, mostly near the coast but also scattered inland. The only Ky. records are colls. from marshy places in TODD (AP). It has also been collected from nearby counties in Tenn. (Montgomery and Robertson); see APSU and Ch.
HAB 9? C? 4? **ABU** g9 s3? -2?

2726--*Carex straminea* Willd. ex Schkuhr

Cyperaceae <Cariceae>: *Carex* <Ovales> *straminea*

This is distinct from most other species, but see notes under *alata*; $2n = 74$. *C. straminea* has a relatively narrow range from east-coastal states (D.C. to Mass.) to the Ohio Valley and adjacent glacial plains. In Ky. it is generally rare but locally common on less disturbed marshy or boggy soils.
HAB 6,9 C 4. **ABU** g8 s4 -4.

2727--*Dulichium arundinaceum* (L.) Britt.

Cyperaceae <Scirpeae>: *Dulichium arundinaceum*
This monotypic genus ($2n = 32$) is widespread in marshes of North America except in arid regions. It is uncommon to rare in Ky., and largely restricted to oligotrophic wetlands with relatively little disturbance.
HAB 2,9 ~ C 5. **ABU** g10 s6 -3.

2728--*Scirpus georgianus* Harper

Cyperaceae <Scirpeae>: *Scirpus georgianus* (*atrovirens* var. g.)
This occurs in east-central states, mostly in a zone from mid-Atlantic states to the Ozarkian region (K). In Ky. it often appears weakly differentiated from *atrovirens*, but tends to occur on more acid or less eutrophic sites. Treatments range from complete combination (Cr), to varieties (F, BT; Arnold & Beal 1980), to separate species (FNA 23, W, Y).

S. georgianus is diagnosed by usually having 0-3 bristles around each achene (versus 5-6); the bristles are short or rarely up to 0.7 as long as the achene (versus short to about as long), smooth or barbed only near tips (versus barbed in distal 0.3-0.6). Vegetative characters are less clearcut, but *georgianus* usually has deep green to brownish lower sheaths and leaves (versus pale green to light brown), and the sheaths usually have relatively few clear septae (versus becoming conspicuously nodulose-septate on drying). *S. georgianus* tends to be less robust, with narrower leaves and smaller clusters of spikelets, on average; $2n = 48-54$ (versus 50-62).

HAB 9 C 5. **ABU** g9 s9 -2?

2729--*Scirpus atrovirens* Willd.

Cyperaceae <Scirpeae>: *Scirpus atrovirens* (var. a.)
This is widespread in base-rich marshy sites across eastern North America, but is less common on the southeastern Coastal Plain. See notes under *georgianus* and *hattorianus*; further study of some colls. is needed for reliable separation of records.
HAB 9,2 D 5. **ABU** g10 s10 -2?

2730--*Scirpus hattorianus* Makino T

Cyperaceae <Scirpeae>: *Scirpus hattorianus*

Though initially described from Japan, this taxon is widely scattered across northeastern states and adjacent Canada, where it probably originated (Schuyler 1967; FNA 23, W). *S. hattorianus* is a cryptic relative of *atrovirens* that has been combined by some authors (e.g. Cr). It has less septate-nodulose lower blades and sheaths; spikelets tend to be more broadly ovate, with more blackish (versus brownish) scales; achenes are usually shorter (0.7-1.1 mm versus 1-1.3 mm), with bristles somewhat intermediate between *atrovirens* and *georgianus*; 2n = 56. A coll. from CLAR (GH) was determined as this species by G.C. Tucker and others: M.R. Beckett #643, 6 Jul 1955, margin of stream, Elkin Station Road. It has also been found nearby in Adams and Sandusky Counties, Ohio (colls. of A. Cusick at DOV).

2731--*Scirpus expansus* Fern.

Cyperaceae <Scirpeae>: *Scirpus expansus* ("silvaticus")

This occurs mostly to the northeast and in cooler Appalachian regions (K). In Ky. it is known only from three sites in ROWA (MDKY). It can easily be confused with *atrovirens*; in addition to differences in spikelets, it has long reddish/purplish rhizomes and lower sheaths (Cr, F, FNA 23). *S. expansus* is closely related to the Eurasian *S. sylvaticus* L. (especially) and to *microcarpus*, which can form hybrids; 2n = 62-66 in the complex.

HAB 9,2,1? C 5. **ABU** g8 s2 -3.

2732--*Scirpus microcarpus* J.& K. Presl

Cyperaceae <Scirpeae>: *Scirpus microcarpus* (*rubrotinctus*)

This close relative of *expansus* has a more widespread northern and western range. The single Ky. record is a coll. of J.W. Thieret from BRAK (KNK) det. by A.E. Schuyler.

HAB 9? D? 5. **ABU** g10 s2 -2?

2733--*Scirpus polyphyllus* Vahl

Cyperaceae <Scirpeae>: *Scirpus polyphyllus*

This occurs mostly in marshy or boggy sites of Appalachian regions, with local extensions west to the Ozarks (FNA 23, K). In contrast to the *atrovirens* group, *polyphyllus* is largely restricted to acid soils, and often extends into streamheads with some shade; 2n = 58.

HAB 6,9 B 4. **ABU** g9 s9 -2.

2734--*Scirpus cyperinus* (L.) Kunth

Cyperaceae <Scirpeae>: *Scirpus cyperinus* {with vars.}

This variable species is widespread in wet soil and shallow water across eastern and central North America; 2n = 60-70 (FNA 23). Several colls. from Ky. are referable to var. *rubricosus* (Fern.) Gilly (= *S. eriophorum* Michx.), which is a southern form; a few may be referable to var. *pelius* Fern., which is a northern form. However, these two taxa have been hard to distinguish (Arnold & Beal 1980), and they are not recognized in most recent treatments. Colls. do need to be rechecked for the slightly more distinct species, *pedicellatus*; see notes under that name.

HAB 2,3,9 C 5. **ABU** g10 s10 -1?

2735--*Scirpus pedicellatus* Fern. T

Cyperaceae <Scirpeae>: *Scirpus pedicellatus* (*cyperinus* var. p.)

In Ky. this northeastern species has been reported from JEFF (Gunn 1968b; see GH), MONT and POWE (Wharton 1945; see MICH), but colls. have not been verified. It is known from all states north of Ky., where it "often hybridizes with *S. cyperinus* and forms hybrid swarms" (FNA 23). In *pedicellatus*, spikelets are usually pedicellate except for the central one in each cyme (versus at least some sessile in addition to central ones); scales are usually pale brown (versus reddish-brown or blackish); and fruits mature in Jul (versus Aug-Sep); 2n = 68.

2736--*Scirpus pendulus* Muhl.

Cyperaceae <Scirpeae>: *Scirpus pendulus* ("lineatus")

This ranges across much of eastern and central North America, but usually associated with base-rich soils; it is most common in the midwest and rare to absent on much of the southeast Coastal Plain (K, W). It usually grows in areas that are wet or damp in spring, but that dry out severely during summer to fall. *S. lineatus* Michx. (= *S. fontinalis* Harper) is a more southern species that has more pendulous inflorescences than *S. pendulus* and lower chromosome number (2n = 36 versus 40). These names were muddled in F and some earlier literature (FNA 23).

HAB 9,10 D 5. **ABU** g9 s9 -1?

2737--*Eriophorum virginicum* L.

Cyperaceae <Scirpeae>: *Eriophorum* [*Scirpus*] *virginicum*

This northeastern species was recently discovered at Cumberland Gap National Historical Park (HARL) by A. Risk; near Laurel Lake (LAUR) by JC and Abbott et al. (2004); and at the Hog Hollow seeps (BATH) by A. Risk.

There are also old reports from Ky. by Rafinesque (McMurtrie 1819), Riddell (1835) and Gleason (1952).

HAB 9 A 5. **ABU** g10 s2 -4?

2738--Trichophorum planifolium (Spreng.) Palla

Cyperaceae <Scirpeae>: *Trichophorum* [*Scirpus*] *planifolium* (S. *verecundus*) This is distributed widely in northeastern, central Appalachian and Ozarkian regions, usually growing in thin woods on dry acid soils (FNA 23, Y). In Ky. it is known only from LEE (Campbell et al. 1989), but it has probably been much overlooked. It is locally common in se. Ohio (e.g. Shawnee State Forest; D. Boone, pers. comm.).

HAB 11 ::? C 3. **ABU** g8 s2 -1.

2739--Eleocharis quadrangulata (Michx.) Roemer & J.A. Schultes

Cyperaceae <Eleocharieae>: *Eleocharis* <*Limnochloa*> *quadrangulata* This is widely scattered in marshes and shallow waters of eastern states, including older man-made ponds. At least some colls. from Ky. (e.g. BELL & TRIG) are referable to var. *crassior* Fern., but that variety has not been distinguished from the more southeastern var. *quadrangulata* in recent treatments.

HAB 2 ~ D? 5. **ABU** g9 s8 -2.

2740--Eleocharis intermedia J.A. Schultes R

Cyperaceae <Eleocharieae>: *Eleocharis* <*Eleocharis*> *intermedia* This northeastern diploid ($2n = 22$) is an annual relative of the compressa-group and tenuis-group, and there can also be hybridization with the obtusa-group (FNA 23). *E. intermedia* is known from calcareous seepages among the higher mountains of e. Tenn. and w. Va., but most records from the Ohio Valley need to be checked (K, PL, W). It was reported from Ky. by Muenscher (1944) and Kellerman (1957). There is a coll. of G.D. Kellerman & Kahn (#171) from BULL (DHL) that has been named "*intermedia*" but it has lost its spikes. There is also a reported coll. from CALL (herbarium of Ind. Univ. SE).

2741--Eleocharis verrucosa (Svens.) L. Harms

Cyperaceae <Eleocharieae>: *Eleocharis* <*Eleocharis*> *verrucosa* (*tenuis* var. v.*)

Mapping here is provisional. This taxon occurs mostly in the Mississippi drainage, sometimes on more base-rich soils than typical *tenuis*, but it also extends east to central Atlantic states (Cr, FNA 23, PL, Y, W). There has been

much confusion with typical *tenuis*, and the two taxa are combined as varieties by some authors. Further work is needed in Ky. to separate records as much as possible. In addition to its distinctly depressed, coarsely rugose achenes, *verrucosa* can often be distinguished by its relatively thick rhizomes with shorter internodes and more fibrous scales; $2n = 20$ (versus 24).

HAB 9 :: C? 5. **ABU** g9 s9? -2?

2742--Eleocharis tenuis (Willd.) J.A. Schultes

Cyperaceae <Eleocharieae>: *Eleocharis* <*Eleocharis*> *tenuis* (var. t.*) This occurs mostly in wet acid soils from Appalachian regions to the Atlantic; see notes under *verrucosa*.

HAB 9 :: B 5. **ABU** g9 s8 -2?

2743--Eleocharis pseudoptera Weatherby ex Sven. T

Cyperaceae <Eleocharieae>: *Eleocharis* <*Eleocharis*> *pseudoptera* (*tenuis* var. p.*)

This northeastern taxon is close to *verrucosa* and *tenuis*, but can be distinguished by its more robust stems and several other characters; $2n = 38$ or 39 (FNA 23). It was reported (as a variety) from Ky. in FNA 23, but details are not available. A coll. from the Murphy's Pond area in HICK (KY) has been annotated "*v. ?pseudoptera*" by S.G. Smith, and there are also records from adjacent w. Tenn. (Ch). Further research is needed to map this taxon better within the Ohio Valley.

2744--Eleocharis elliptica Kunth

Cyperaceae <Eleocharieae>: *Eleocharis* <*Eleocharis*> *elliptica* (*tenuis* var. borealis; ?*acuminata*)

This northeastern taxon of base-rich wetlands appears closely related to *pseudoptera*; $2n = 38$ probably in both taxa (FNA 23). The best diagnostic character of *elliptica* is the (4) 6-8 (10) angles in stem cross-sections; other taxa in the *tenuis* group have 4 (5) angles. There are almost no definitive records from Ky., but a skimpy coll. from the Backbone Swamp in FRAN (EK) is tentatively included here. Also, a few colls. appear transitional from *elliptica* to *compressa* (LEWI at KNK, R.F.C. Naczi #3811), or to *tenuis* (ROWA at MDKY & KNK, L. Meade #564; mapped as *elliptica* by BT). *E. acuminata* (Muhl.) Nees is a synonym of *elliptica*, but it has been applied in some cases to plants now known as *E. bifida* (M).

HAB 9? :: D? 5. **ABU** g9 s2? -2?

2745--Eleocharis compressa Sullivant

Cyperaceae <Eleocharieae>: *Eleocharis* <*Eleocharis*> *compressa* (elliptica var. c.)

This is a widespread, highly variable species, centered largely in the midwest; $2n = ?18-36$ (Cr, FNA 23). It may intergrade locally with *tenuis*, *bifida*, *elliptica* and *erythropoda*. Several records from Ky. remain uncertain; see also notes under *bifida*. At least one coll. from LEWI (KNK, R.F.C. Naczi #3811) may be transitional to typical *elliptica*, and was det. by G. Smith as "*compressa* x *elliptica* probably."

HAB 9,10,1,12 ::+ E 5. **ABU** g9 s8 -3.

2746--*Eleocharis bifida* S.G. Smith

Cyperaceae <Eleocharieae>: *Eleocharis* <*Eleocharis*> *bifida* (*compressa* p.p., "*acuminata*")

This recently described segregate of *compressa* is known only from limestone outcrops in Ala., Ga., Ky. and Tenn. (C.G. Smith et al. in FNA 23). It can be distinguished from *compressa* by its pistillate scales, which are all deeply bifid (versus at least the lower ones entire); styles are often bifid (versus all trifid), and seeds are often biconvex (versus all uncompressed). Also, its rhizomes are 3-5 mm thick (versus 2-3 mm), producing relatively tight clumps of culms that are highly compressed, with a width of 4-10 times thickness (versus 2-5 times).

It is possible that a few Ky. colls. are intermediates, as found in Tenn. (TENN), but most plants previously known as *compressa* in Ky. are now referable to *bifida*. A mixed population apparently occurs along the rocky banks of the Little South Fork of Cumberland Rv. in MCRE and WAYN (dets. of G. Smith at KY). See also note on "*acuminata*" under *elliptica*.

HAB 9,10,12 == E 5. **ABU** g5? s4? -1?

2747--*Eleocharis tuberculosa* (Michx.) Roemer & J.A. Schultes

Cyperaceae <Eleocharieae>: *Eleocharis* <*Eleocharis*> *tuberculosa*

This distinctive annual or short-lived perennial occurs mostly in Atlantic and southeastern coastal states. It was recently collected in swampy woods of CLIN by Naczi et al. (2002). It differs from other eastern *Eleocharis* of Ky. in its roughly reticulate achense capped with an unusually broad tubercule about a large as the achene; plants usually form dense broad tussocks; $2n = 30$ (FNA 23).

HAB 9,6 :: C 5? **ABU** g9 s2 -3.

2748--*Eleocharis erythropoda* Steud.

Cyperaceae <Eleocharieae>: *Eleocharis* <*Eleocharis*> *erythropoda* (*calva*)

In Ky. this northeastern species is widely scattered on base-rich marshy soils. It is a diploid ($2n = 18$) relative of the *palustris* complex; see notes under *smallii*.

HAB 9 :: D 5. **ABU** g10 s9 -3.

2749--*Eleocharis smallii* Britt.

Cyperaceae <Eleocharieae>: *Eleocharis* <*Eleocharis*> *smallii* (*palustris* var. ?*australis*)

This largely diploid ($2n = 16$) member of the *palustris* complex occurs in eastern North America. Some colls. (especially from HARD) may be referred to the more western *E. macrostachya* Britt., a polyploid of possible hybrid origin ($2n = 38$).

But this distinction is not clearcut, and both taxa have been combined in some treatments with the European species: *E. palustris* (L.) Roemer & J.A. Schultes. Further analysis of this circumboreal complex is needed (FNA 23). There has also been some confusion with *erythropoda* (which was apparently mapped as *palustris* by BT in BULL and SHEL).

HAB 2 ~ C 5. **ABU** g8 s8 -2.

2750--*Eleocharis engelmannii* Steud.

Cyperaceae <Eleocharieae>: *Eleocharis* <*Eleocharis*> *engelmannii* (*ovata** var. *e./detonsa*)

This has a widespread North American range similar to *obtusa*. These have generally been considered distinct taxa, at least as varieties, but intermediates are known (FNA 23). *E. engelmannii* typically occurs around larger, more stable, less eutrophic bodies of water; it is much less common than *obtusa* around small artificial farm ponds.

HAB 2,9 ::: C 6. **ABU** g10 s9 -1?

2751--*Eleocharis obtusa* (Willd.) J.A. Schultes

Cyperaceae <Eleocharieae>: *Eleocharis* <*Eleocharis*> *obtusa* (*ovata** var. *obtusa*)

The degree of distinction in this widespread North American taxon from *engelmannii* and *ovata* needs further assessment; $2n = 10$ in all three taxa (see notes under those names). Some colls. from GARR, LAUR and POWE (EKY) are referable to the depauperate form previously known as var. *jejuna* Fern.

HAB h-2,9 ::: D 6. **ABU** g10 s10 +1?

2752--*Eleocharis ovata* (Roth) Roemer & J.A. Schultes T

Cyperaceae <Eleocharieae>: Eleocharis <Eleocharis> ovata (var. ovata)
This widespread northern (circumboreal) species has been confused with obtusa, and there may be some intergradation (FNA 23, Y). E. ovata differs from obtusa and engelmannii in its relatively narrow tubercles (1/2 to 3/4 as wide as achenes), and its stamens only 2 (versus 3). There have been several reports from Ky. (M, FNA 23), but it remains unclear if there are verified colls. from Ky. or elsewhere in the Ohio Valley (PL). No colls. at KY were det. as typical ovata by S.G. Smith for FNA 23.
HAB 2,9 ::: C 6. **ABU** g10? s9? -1?

2753--Eleocharis olivacea Torr. R
Cyperaceae <Eleocharieae>: Eleocharis <Eleocharis> olivacea (flavescens* var. o.)
This is a widely scattered eastern species, mostly in coastal or lacustrine regions, but FNA 23 did not include Ky. in the range. It was reported from the confluence of Big and Little Caney Creeks in ELLI by Cusick (1989), but the coll. needs to be rechecked (NY, NCU). E. olivacea has been confused with intermedia in Ohio, where both species do occur. Distinction from typical E. flavescens (Poiret) Urban may be difficult in zones of overlap, but these taxa should be recognized at least as varieties (FNA 23) if not species (W). E. flavescens is a more southern (largely subtropical) plant with a higher chromosome number; 2n = 30 versus 20.

2754--Eleocharis acicularis (L.) Roemer & J.A. Schultes
Cyperaceae <Eleocharieae>: Eleocharis <Scirpidium> acicularis
This is a widespread variable circumboreal species; 2n = 20-58 (FNA 23). It typically occurs on somewhat stagnant shores with much fine clay and rather low fertility, but with a pH ranging from 3 to 7 (Rothrock & Wagner 1975). The superficially similar tenuis (as well as its relatives) is generally less slender in its culms and rhizomes, and is more confined to acid sites, often with sand. Several uncertain records from Ky. are based on immature spikelets, but vegetative characters suggest acicularis.
HAB 9 :: C 5. **ABU** g10 s8 -2?

2755--Fuirena simplex Vahl var. aristulata (Torr.) Kral
Cyperaceae <Fuireneae s.l.>: Fuirena simplex* var. aristulata
F. simplex is a rhizomatous perennial of base-rich soils in south-central states. Var. aristulata is a distinct taxon that usually occurs on shores; var. simplex usually occurs on seepy uplands (FNA 23, Y). The only Ky. records are colls.

during 1984 from FULT in the "lower sandy drainage pattern of Fish Lake" (R. Athey # 4937 & 4974 at EKY).
HAB 2? ::? C? 6? **ABU** g8 s2 -3?

2756--Fuirena squarrosa Michx. R
Cyperaceae <Fuireneae s.l.>: Fuirena squarrosa
This southeastern species occurs mostly on sandy soils of the Coastal Plain. It has been reported from Ky. by F and others, but no colls. have been located. It is known from w. Tenn., and may be expected on the Coastal Plain in Ky.

2757--Bulbostylis capillaris (L.) Kunth ex C.B. Clarke
Cyperaceae <Fuireneae s.l.>: Bulbostylis capillaris
This small tufted annual is widespread from Central America to eastern states, usually on dry acid sandy or rocky soils. It is easily overlooked and probably much more widespread than records suggest.
HAB 12,10 +? C 6? **ABU** g10 s8 -2.

2758--Fimbristylis littoralis Gaudichaud
Cyperaceae <Fuireneae s.l.>: Fimbristylis littoralis ("miliacea")
This pantropical annual weed of rice has become locally common in warmer regions of southeastern states within the past 40-50 years (FNA 23, Y, W). Despite historical confusion with some related species, littoralis is remarkably uniform; 2n = 10. It was known for 200 years as F. miliacea (L.) Vahl., which name has now been officially rejected (as cited and followed by W).
ALI AS. **HAB** h-9,2? ::: D 6. **ABU** +4.

2759--Fimbristylis autumnalis (L.) Roemer & J.A. Schultes
Cyperaceae <Fuireneae s.l.>: Fimbristylis autumnalis
This pantropical annual extends north throughout most eastern states. Despite its great range, segregates are not generally recognized; 2n = 10 (FNA 23). Colls. from BULL (KY), JEFF (DHL) and elsewhere are referable to var. mucronulata (Michx.) Fern., but that widespread southern (to tropical) variety is not recognized in recent treatments.
HAB h-9,3,2 ::: C 6. **ABU** g10 s9 +1?

2760--Fimbristylis perpusilla Harper ex Small & Britt.
Cyperaceae <Fuireneae s.l.>: Fimbristylis perpusilla
This globally rare, diminutive annual of dried shores occurs mostly on the Atlantic Coastal Plain. It is a remarkable diploid relative of vahlii and annua, reaching no more than 8 cm in height; 2n = 10. F. perpusilla has recently been

discovered on mudflats of Honker Lake in TRIG (Boone & Chester 2009; see APSU), which extended its known range 150 miles west from the Cumberland Plateau of Tenn. (Wofford & Jones 1988).

HAB 2 ::: C? 6. **ABU** g3? s1 =?

2761--Fimbristylis vahlii (Lam.) Link

Cyperaceae <Fuireneae s.l.>: *Fimbristylis vahlii*

This annual ranges from South America to southeastern states, usually growing on seasonally drying sandy or muddy shores. Height is up to 15 cm; $2n = 20$ (FNA 23).

HAB 2 ::: D 6. **ABU** g9 s5? -2?

2762--Fimbristylis annua (All.) Roemer & J.A. Schultes

Cyperaceae <Fuireneae s.l.>: *Fimbristylis annua*

This robust pantropical annual is widespread from South America to warmer regions of southeastern states. It usually grows on damp to seasonally dry shores and uplands, often with sandy or gravelly soils. Height is up to 30-50 cm; $2n = 30$. It is known as far north as c. Mo., s. Ill. and s. Ind. (FNA 23, K, Y). The only Ky. record is a coll. from LIVI, made by M. Medley (#15533-86 for WKY) at Mantle Rock, and it needs rechecking. There may also be old colls. of C.W. Short (e.g. at Copenhagen) without locality (M).

ALI s. **HAB** 12 == C 6. **ABU** g10 s2? -2?

2763--Fimbristylis puberula (Michx.) Vahl

Cyperaceae <Fuireneae s.l.>: *Fimbristylis puberula* (var. p., drummondii)

Broadly defined, this perennial species is widely distributed across eastern and southern states, but generally uncommon except in the Ozark region and the Coastal Plain from e. Tex. to most of Fla. Further revision of *puberula* and its relatives is needed; $2n = 20$ and 40 (FNA 23). Typical habitat in Ky. is xeric to xerohydric, clayey to gritty, calcareous glades, whereas typical plants further south occur on more hydric sites in pine savannas and similar places (W). There has also been some confusion with *F. caroliniana* (Fam.) Fern., a more southern species of coastal marshes.

HAB 10,9,12? ::: C 6. **ABU** g9 s2 -3?

2764--Bolboschoenus fluviatilis (Torr.) Soják

Cyperaceae <Fuireneae s.l.>: *Bolboschoenus* [*Scirpus*] *fluviatilis*

This is widespread in marshes across much of North America, but rare to absent in most southeastern states. The few Ky. records are mostly from extensive wetlands in western regions of the state. The disjunct eastern coll.

from MAD1 was made at the edge of a man-made lake. *Bolboschoenus* has been traditionally combined with *Scirpus*, but is closer to *Schoenoplectus*; most species are high polyploids with $2n = 94-110$ (FNA 23).

HAB 1,2 ~? D 6. **ABU** g10 s4 -2?

2765--Schoenoplectus hallii (Gray) S.G. Sm.

Cyperaceae <Fuireneae s.l.>: *Schoenoplectus* [*Scirpus*] *hallii* (supinus var. h.)

This annual is a globally rare diploid ($2n = 22$) of midwestern regions. In Ky. it is known from only two localities in ephemeral sinkhole ponds within or near cropped fields. The site discovered by E.W. Chester in CHRI (APSU) is reduced and threatened by development. The site recently discovered by B. Palmer-Ball in LOGA (KSNPC) is associated with a more natural area, Mosely Pond.

HAB h-9 ::: D 6. **ABU** g4? s1 -3?

2766--Schoenoplectus purshianus (Fern.) M.T. Strong

Cyperaceae <Fuireneae s.l.>: *Schoenoplectus* [*Scirpus*] *purshianus* (var. pur.; "smithii"; debilis)

This annual is widespread in marshy wetlands of southeastern states, often colonizing edges of artificial ponds. In Ky. it is generally associated with oligotrophic waters, and is rare to absent in calcareous landscapes. The names *Scirpus smithii* Gray or *S. smithii* var. *williamsii* (Fern.) Beetle have been erroneously applied to some Ky. plants in the past (BT, M). Those names belong to more northern taxa with $2n = 40$, versus 38 in typical pungens (FNA 23).

HAB 2 ~? C 6? **ABU** g9 s8? -2?

2767--Schoenoplectus mucronatus (L.) Palla W

Cyperaceae <Fuireneae s.l.>: *Schoenoplectus* [*Scirpus*] *mucronatus*

Although omitted by Cr, this European annual has become "firmly established" at several localities in North America, especially in the midwest, and it may be increasing (FNA 23). *S. mucronatus* is easily confused with *purshianus*. In Ky. it is known from some artificial ponds in PULA (KNK), where it may have been introduced with cultivated water lilies.

ALI EU. **HAB** 2 ~? C? 6? **ABU** +4.

2768--Schoenoplectus torreyi (Olney) Palla R

Cyperaceae <Fuireneae s.l.>: *Schoenoplectus* [*Scirpus*] *torreyi*

This northeastern species is a close relative of *pungens*; $2n = 42, 70$. It has been reported from Ky. but not recently verified (Muenscher 1944; F; FNA

23). There is a correctly identified coll. of C.W. Short (check PH) made in 1830, which may be from Ky. but with an uncertain locality. Across much of its southern and western range, it is generally imperiled, and several other old state records remain uncertain. It generally occurs as an "emergent in fresh ponds and marshes, often with fluctuating water levels" (FNA 23).

2769--*Schoenoplectus pungens* (Vahl) Palla

Cyperaceae <Fuireneae s.l.>: *Schoenoplectus* [*Scirpus*] *pungens* (var. pun.; "americanus")

Typical *pungens* is a rhizomatous plants that has been reported widely from marshy wetlands of South and North America, but it may be relatively uncommon in warmer regions of southeastern states (Cr, FNA 23, K, W). Variation needs further assessment; $2n = 74-78$. It is likely that the western segregate, var. *longispicatus* (Britt.) S.G. Sm., also occurs in Ky. but there are no records so far. The name *Scirpus americanus* Pers. was misapplied to *pungens* in some older treatments (e.g. F). The name *Scirpus olneyi* Gray was applied to true *americanus*, a closely related western species of alkaline or saline marshes that is unknown in Ky. (FNA 23).

HAB 9,2,1 D? 5. **ABU** g10 s7 -2?

2770--*Schoenoplectus tabernaemontani* (K.C. Gmel.) Palla

Cyperaceae <Fuireneae s.l.>: *Schoenoplectus* [*Scirpus*] *tabernaemontanii* (validus var. *creber*)

This robust circumboreal species is widespread in base-rich wetlands of South and North America (FNA 23). *S. validus* Vahl. is a weakly defined American segregate that has been recognized by some authors. These taxa are part of a somewhat intergradient complex that includes *acutus*, *heterochaetus* and *lacustris*; $2n = 36-42$ for the group.

HAB 9,2,1 D 5. **ABU** g10 s9 -2?

2771--*Schoenoplectus acutus* (Muhl. ex Bigelow) A.& D. Löve

Cyperaceae <Fuireneae s.l.>: *Schoenoplectus* [*Scirpus*] *acutus*

This northern and western species is close to *tabernaemontani*, and hybrids appear to be locally frequent (Arnold & Beal 1980); see FNA 23 for details. The only Ky. record is a coll. by R. Athey from FULT that was verified and accessed at MEM, SIU and elsewhere (Browne & Athey 1978).

HAB 9? D? 5. **ABU** g10 s2 -2?

2772--*Schoenoplectus heterochaetus* (Chase) Soják

Cyperaceae <Fuireneae s.l.>: *Schoenoplectus* [*Scirpus*] *heterochaetus*

This largely northwestern species is close to *tabernaemontani* and can be confused (FNA 23). In addition to a coll. by R. Athey (#3272) from CRIT (EKY), it was reported from "centr. Ky." by F.

HAB 9? D? 5. **ABU** g9 s2 -2?

2773--*Scirpoides holoschoenus* (L.) Soják W

Cyperaceae <Cypereae>: *Scirpoides* [*Scirpus*] *holoschoenus*

This is a Eurasian species typical of damp sandy coastal flats. It was collected from a "chrome ore pile" in MARS (Browne & Athey 1976; coll. perhaps at MEM). It remains virtually unknown elsewhere in North America (FNA 23).

ALI EU.

2774--*Isolepis carinata* Hook. & Arn. ex Torr.

Cyperaceae <Cypereae>: *Isolepis* [*Scirpus*] *carinata* (*S. koilolepis*)

This is widely scattered across southern states but concentrated on the Gulf Coastal Plain and adjacent uplands. It usually grows on seasonally damp sandy soils that dry out in summer, often in association with remnants of native grassland or rocky glades.

HAB h-9 ::? B 6? **ABU** g10 s8 -2?

2775--*Cyperus rotundus* L.

Cyperaceae <Cypereae>: *Cyperus* <*Cyperus*> *rotundus*

This bad weed of tropical agriculture has tuberiferous rhizomes, like its temperate relative, *esculentus* (FNA 23). These two taxa are part of a polyploid complex; $2n = 16-152+$ with 108 often predominant in *esculentus* at least. *C. rotundus* has established locally in Paducah (MCRA), Louisville (JEFF) and Monticello (WAYN). Although not generally persistent in temperate regions, the population in Monticello began with a horticultural introduction in 1960/61 and was found in adjacent mowed lawns during 1995 (EKY)

ALI S. **HAB** H-10 ::? D 6? **ABU** g10 s5? -2?

2776--*Cyperus esculentus* L.

Cyperaceae <Cypereae>: *Cyperus* <*Cyperus*> *esculentus*

This widespread pantropical and warm temperate weed may be native in Ky. It has been common here for over a century (Riddell 1835, Short et al. 1833, Gm). Variation needs more study: all material from Ky. may be var. *leptostachyus* Boeckl., but colls. should be checked for var. *macrostachyus* Boeckl., which is in southeastern states (W). *C. esculentus* is especially successful in horticultural situations, where tuberiferous rhizomes persistently

exploit fresh loose soil. Plants "often have a sweet aroma when bruised or during drying" (Y).

ALI s. **HAB** H-10 ::? D 6. **ABU** g10 s10 +3?

2777--Cyperus iria L.

Cyperaceae <Cypereae>: *Cyperus* <Cyperus> *iria*

This annual is a widespread variable agricultural weed, especially with rice in subtropical regions; 2n = 16-128 (FNA 23). It is continuing to expand its range into warmer temperate zones.

ALI AS. **HAB** h-9,2 ::? C 6. **ABU** +4.

2778--Cyperus microiria Steud.

Cyperaceae <Cypereae>: *Cyperus* <Cyperus> *microiria* (amuricus)

This East Asian annual is a close relative of *iria*, found mostly in temperate regions (versus tropical). In Ky. it has been found only in BALL, but it has probably been overlooked in other regions (Mears & Libby 1995, Mears 1999, J). *C. microiria* appeared in New York and New England after 1980, but has not yet spread into southeastern states (FNA 23, W). The name *C. amuricus* Max. may be correct for this species rather than *microiria* (PL, W).

ALI AS. **HAB** h-9,2? :: D? 6. **ABU** +4.

2779--Cyperus squarrosus L.

Cyperaceae <Cypereae>: *Cyperus* <Cyperus> *squarrosus* (inflexus, "aristatus")

This aromatic annual is a nearly cosmopolitan variable weedy annual of bare soil in various natural or artificial habitats (FNA 23); 2n = 48, 56 or 64 (but unknown in Ky.). In Ky. it often occurs on rocky sites that puddle after rain, especially with calcareous soils.

HAB h-9,10,12,1 +? D 6. **ABU** g10 s8 +1?

2780--Cyperus compressus L. W

Cyperaceae <Cypereae>: *Cyperus* <Cyperus> *compressus*

This is a widespread variable pantropical annual; 2n = 96-128 (FNA 23). It was recently reported in Ky. (Mears 1999, J). It is known only from a roadside in WHIT (EKY; Mears & Libby 1995) and from a nursery in CAMP (J. Thieret #59758 at KNK). It is probably not well established in the state.

ALI s.

2781--Cyperus strigosus L.

Cyperaceae <Cypereae>: *Cyperus* <Cyperus> *strigosus*

This annual or caespitose perennial (without distinct rhizomes) is widespread across North America except in arid regions, and in Ky. it is the most common *Cyperus*. *C. strigosus* occurs on diverse wet to damp habitats, including agricultural and urban landscapes. It appears to be a highly variable species, but segregates are not readily defined; chromosome number is high and has not been precisely counted (as in most native species).

HAB H-10,9 ::: D 6. **ABU** g10 s10 +2?

2782--Cyperus erythrorhizos Muhl.

Cyperaceae <Cypereae>: *Cyperus* <Cyperus> *erythrorhizos*

This annual is widespread in varied wet shorelines and similar habitats across the United States, without any segregates; 2n = 96. It is often associated with sandy soils (F, Y), and in Ky. appears to be much less common to absent on calcareous soils. It is often confused with *strigosus* in the field, but its spikelets have distinctly shorter scales and are much less flattened; also roots are reddish, unlike any other *Cyperus* in Ky.

HAB h-9,2 ::? C 5. **ABU** g10 s9 -2?

2783--Cyperus refractus Engelm. ex Boeckl.

Cyperaceae <Cypereae>: *Cyperus* <Mariscus> *refractus*

This has a relatively narrow range from mid-Atlantic states to the Ozarks, and is generally uncommon to rare. *C. refractus* occurs in varied natural and artificial habitats but may be most frequent on sandy soils that often dry out in summer.

HAB 10,8? ::? C? 4? **ABU** g7 s7 -2?

2784--Cyperus lancastris Porter ex Gray

Cyperaceae <Cypereae>: *Cyperus* <Mariscus> *lancastris*

This robust relative of *refractus* has a similar range from mid-Atlantic states to the Ozarks, usually on sandy soils, but it is more common. In Ky. it has been confused with true *retrofractus* (*dipsaciformis*); several colls. need to be rechecked. An apparent hybrid with *lupulinus* was collected in BALL (R. Mears at EKY).

HAB 10 ::? B 5. **ABU** g8 s8 -2?

2785--Cyperus retroflexus Buckl. R

Cyperaceae <Cypereae>: *Cyperus* <Mariscus> *retroflexus*

This southwestern relative of *lancastris* occurs on dry sandy soils up the Mississippi Valley to se. Mo. and n. Miss. (K, FNA 23). It was recently

reported from Ky. by Mears (1999; see also J), but colls. have not been located.

2786--*Cyperus plukenetii* Fern.

Cyperaceae <Cypereae>: *Cyperus* <Mariscus> *plukenetii* (retrofractus var. p.) In Ky. this southeastern species of dry sandy soils has been rarely recorded. Colls. were made during the 1930s (B) and the 1980s (J. Campbell at KY) from the same general locality in MCRE (Yahoo Ridge). The record from ROWA is tentatively based on Braun #4840 (perhaps at US), which needs to be rechecked.

HAB 10 ::? B 5. **ABU** g9 s2 -5?

2787--*Cyperus retrofractus* (L.) Torr.

Cyperaceae <Cypereae>: *Cyperus* <Mariscus> *retrofractus* (dipsaciformis, var. r.)

This close relative of *plukenetii* occurs from mid-Atlantic states to the central Mississippi Valley, usually growing on dry sandy soils or perhaps seasonally damp.

The name *retrofractus* was misapplied to *hystrikinus* in some earlier treatments, and F established the name *C. dipsaciformis* Fern. for this species.

HAB 10,12,9? ::? B 5? **ABU** g8 s8 -2?

2788--*Cyperus hystrikinus* Fern. R

Cyperaceae <Cypereae>: *Cyperus* <Mariscus> *hystrikinus* (*retrofractus* var. h.)

This southeastern species occurs mostly on dry sandy soils of the Coastal Plain. It has been confused with typical *retrofractus* and *lancastricensis* in Ky. and elsewhere. There are no confirmed records, but it is expected in western regions. *C. hystrikinus* is known from se. Mo. (Y) and perhaps s. Ind. (F).

2789--*Cyperus croceus* Vahl

Cyperaceae <Cypereae>: *Cyperus* <Mariscus> *croceus* ("globulosus", "echinatus", *retrorsus* var. *robustus*)

This relative of *retrorsus* occurs from southeastern states to South America. It is also close to *C. echinatus* Ell., a name that has been previously misapplied to *C. croceus*, while true *echinatus* was known as *C. ovularis* (Michx.) Torr. *C. croceus* was recently reported from Ky. (Mears & Libby 1995, Libby et al. 1997), and is probably adventive.

ALI s. **HAB** R-10 ::? C 6. **ABU** g10 s3? -2?

2790--*Cyperus retrorsus* Chapman

Cyperaceae <Cypereae>: *Cyperus* <Mariscus> *retrorsus*

This southeastern species occurs mostly on dry sandy soils of the Coastal Plain, perhaps most vigorous after fire (F, FNA 23). In Ky. appears to be rare, but there has been some confusion with *lancastricensis*, and some colls. should be rechecked. All plants are probably referable to var. *cylindricus* (Ell.) Fern. & Grisc., but that taxon is not recognized in recent treatments.

HAB 12,10 + A? 6? **ABU** g8 s5? -3?

2791--*Cyperus echinatus* (L.) Wood

Cyperaceae <Cypereae>: *Cyperus* <Mariscus> *echinatus* (*ovularis*)

In Ky. this widespread southeastern species is locally common in fields and native grasslands, especially on well-drained sandy soils.

HAB f-10,12 ::? B? 4? **ABU** g10 s9 -2?

2792--*Cyperus lupulinus* (Spreng.) Marcks

Cyperaceae <Cypereae>: *Cyperus* <Mariscus> *lupulinus* (ssp. l.; *filiculmis*)

This occurs ranges widely across the United States but is most common in the midwest. Some colls. from Ky. may need to be rechecked for *macilentus*.

Also, there may be occasional hybrids with *schweinitzii*, *lancastricensis* or perhaps other species (FNA 23). The *lupulinus*-*schweinitzii* complex includes high polyploids; 2n = 164-170 in most reports.

HAB h-9,2? ::? C? 6. **ABU** g9 s8 -2?

2793--*Cyperus macilentus* (Fern.) E.P. Bicknell

Cyperaceae <Cypereae>: *Cyperus* <Mariscus> *macilentus* (*lupulinus* ssp. m.)

This largely northeastern taxon is morphologically distinct from *lupulinus*, with only rare exceptions (FNA 23). It has also been confirmed in the state by Mears (1999). The three colls. mapped here all come from banks of the Ohio Rv. or nearby.

HAB h-9,2? ::? C? 6. **ABU** g8 s3? -2?

2794--*Cyperus schweinitzii* Torr.

Cyperaceae <Cypereae>: *Cyperus* <Mariscus> *schweinitzii*

This widespread western species extends east to midwestern states. In Ky. it is known only from a single coll. along a railroad in CAMP (KNK).

ALI W. **HAB** R-9,10? ::? C? 6? **ABU** +4.

2795--*Cyperus odoratus* L.

Cyperaceae <Cypereae>: *Cyperus* <Diclidium> *odoratus* (*ferruginescens*)

This robust pantropical annual (or short-lived perennial) America extends north to temperate regions of North America. Variation needs further assessment. Much material from Ky. is referable to *C. ferruginescens* Boeck., which was formerly distinguished in eastern and central states by F and others. However, that taxon is generally not recognized in recent treatments, even as a variety (FNA 23). Typical odoratus (= *C. ferax* L.), in its narrow sense, is a relatively southern taxon, but also present in Ky. See also notes under *engelmannii*.

HAB H-9,10 ::? D? 6. **ABU** g10 s10 +1?

2796--*Cyperus engelmannii* Steud. T

Cyperaceae <Cypereae>: *Cyperus* <Diclidium> *engelmannii* (odoratus var. e.) This segregate of odoratus is widespread from midwestern to northeastern states and adjacent Canada. It has been combined with odoratus in some recent treatments, differing only in its more loosely flowered spikelets with nonoverlapping scales, and more elongated seeds (F, FNA 23, W). *C. engelmannii* was recently reported from BOYD and CUMB in a critical study of the genus within Ky. (Mears & Libby 1995, Mears 1999). Further search for this taxon is needed in the field and herbarium.

HAB ::?

2797--*Cyperus difformis* L.

Cyperaceae <Cypereae>: *Cyperus* <Pycnostachys> *difformis* This annual of the Old World tropics is a bad weed of rice fields. It has begun to spread through southern and western states during recent decades (Lipscomb 1980), and was discovered in Ky. at scattered roadsides and other disturbed sites during the 1990s (Mears & Libby 1995, Libby et al. 1997).

ALI AS. **HAB** H-9? ::? C 6. **ABU** +4.

2798--*Cyperus acuminatus* Torr. & Hook. ex Torr.

Cyperaceae <Cypereae>: *Cyperus* <Pycnostachys> *acuminatus* This annual is widely scattered on wet base-rich sites across the United States but most common in the Great Plains. It has only disjunct or adventive records in some Pacific and Atlantic states (FNA 23, K). It is likely that records from eastern Ky. represent adventive plants.

HAB 9? ::? E? 6. **ABU** g10 s8 -2?

2799--*Cyperus pseudovegetus* Steud.

Cyperaceae <Cypereae>: *Cyperus* <Pycnostachys> *pseudovegetus* ("virens")

In Ky. this robust southeastern perennial is largely restricted to southern regions of the state, but it is locally abundant in wetlands there.

C. entrerianus Boeckeler is a noxious weed similar to *pseudovegetus*. In recent decades, it has spread onto the Gulf Coastal Plain from South America (FNA 23, W and cited literature). It has been found in sw. Mo. (SE) and may be expected in far western Ky. *C. entrerianus* differs in its achenes, which are smaller and less elongated, and its heads do not have the "irregularly lobulate" character of *pseudovegetatus* (see above sources for keys).

HAB 9,2 ::? D? 5. **ABU** g9 s8 -2?

2800--*Cyperus polystachyos* Rottb.

Cyperaceae <Cypereae>: *Cyperus* <Pycrus> *polystachyos* (var. *texensis*) This is a polymorphic pantropical annual that needs reexamination across its whole range, although reportedly 2n = just 98 (FNA 23). All plants in Ky. are referable to var. *texensis* (Torr.) Fern., but that taxon may not be worth recognizing (Y, W).

HAB h-9,2 ::? D 6. **ABU** g10 s7 -3?

2801--*Cyperus flavicomus* Michx.

Cyperaceae <Cypereae>: *Cyperus* <Pycrus> *flavicomus* (*albomarginatus*) This robust weedy annual is widespread from South America to warmer regions of southeastern states.

HAB h-9,2 ::? D 6. **ABU** g10 s7 -3?

2802--*Cyperus flavescens* L.

Cyperaceae <Cypereae>: *Cyperus* <Pycrus> *flavescens* This pantropical weedy annual extends north to most eastern states. All colls. from Ky. are probably referable to var. *poiformis* (Pursh) Fern., but that North American variety is not generally recognized in most recent treatments (e.g. FNA 23). Variation across the global range of this species does merit attention (Y); 2n = 50 and 70.

HAB h-9,2 ::? C 6. **ABU** g10 s10 +1?

2803--*Cyperus bipartitus* Torr.

Cyperaceae <Cypereae>: *Cyperus* <Pycrus> *bipartitus* (*rivularis*, "diandrus") This annual is widespread across the United States, often growing on shores of streams but also spreading to drier uplands, roadsides and other disturbed sites; 2n = 54. See also *diandrus*, a more northern species that is closely related and often confused

HAB h-9,2 ::? C 6. **ABU** g10 s9 -1?

2804--Cyperus diandrus Torr.

Cyperaceae <Cypereae>: *Cyperus* <Pycneus> *diandrus*

This annual is widely scattered on wet shorelines across midwestern and northeastern states, but rare to absent in the Ohio Valley. A coll. of from LAWR was made by M. Medley (for WKY), and verified by G.C. Tucker. Earlier records were probably all based on colls. that should now be named *C. bipartitus* Torr. (= *C. rivularis* Kunth.). These taxa were combined in Robinson & Fernald (1908).

HAB h-9 ::? C 6. **ABU** g10 s4? -3?

2805--Kyllinga pumila Michx.

Cyperaceae <Cypereae>: *Kyllinga* [*Cyperus*] *pumila* (*C. tenuifolius*, *densicaesпитosus*)

This pantropical annual is widespread on fresh wet soil from South America to southeastern states. In Ky. it is rare to absent on calcareous soils.

HAB r-9,1 ::: C 6. **ABU** g10 s9 -2?

2806--Kyllinga gracillima Miq.

Cyperaceae <Cypereae>: *Kyllinga* [*Cyperus*] *gracillima* (*C. brevifolioides*)

This rhizomatous perennial has been spreading into northeastern states during recent decades. Though often considered to have originated from East Asia, the species may also be native to warmer regions of southeastern states (FNA 23, Y, W). In Ky. there are widely scattered records from roadside ditches and similar disturbed sites, especially on sandy or gravelly soils. Mears (1999) has provided most of these records, from his excellent cyperaceous touring in the 1990s; see also Mears & Libby (1995).

ALI AS? **HAB** R-9,1 ::: C 6. **ABU** +5.

2807--Lipocarpa micrantha (Vahl) G. Tucker

Cyperaceae <Cypereae>: *Lipocarpa* (*Hemicarpha*) *micrantha* (var. m.)

This diminutive annual is widely scattered from South America to North America, in tropical and temperate regions. It usually occurs on mudflats, sand- or gravel-bars and other extensive shorelines that are exposed in summer to fall but remain somewhat damp. In Ky. it is known only from sloughs or dammed sections of the larger rivers, or sometimes in nearby fields. ["Florets" in *Lipocarpa* are highly reduced spikelets as in *Kyllinga* (FNA 23), which occurs on similar but more well-drained habitats in Ky.].

HAB 2,3,9 ::: C 6. **ABU** g10 s8 -2?

2808--Xyris torta Sm.

Xyridaceae: *Xyris torta*

This is widespread in eastern states on damp acid sandy soils, but rare to absent in much of the central Mississippi and Ohio Valleys (K). In Ky. most records are clustered in or near streamheads of the southern Cliff Section, where there is probably a history of open grassy conditions.

HAB 9 B 5. **ABU** g9 s6 -4.

2809--Xyris difformis Chapman

Xyridaceae: *Xyris difformis* ("caroliniana")

This has an eastern range similar to *torta*, but concentrated in coastal states and completely absent from the upper mid-west (K). It is more restricted to strongly acid soils. In Ky. it is known only from the "Hog Hollow Seeps" in BATH, where discovered by A. Risk (Campbell et al. 1992).

HAB 9 A 5. **ABU** g8 s2 -4?

2810--Phyllostachys aurea

Poaceae <Arundinarieae>: *Phyllostachys aurea*

This "golden bamboo" from China has been widely planted in southeastern states, and it is locally invasive due to its aggressive rhizomes. In Ky. it is less common, but some patches have become extensive over an acre or more in adjacent woodland or edges (at least in FAYE, GRNP, JEFF, HART and LEE). These will spread much further if left unchecked. Large areas can be killed by repeated cutting or mowing for a year, then repeated applications of glyphosate plus imazapyr on the weakened regrowth (P. Cappiello, pers. comm.).

P. aureosulcata McClure ("yellow-groove bamboo"), has also been planted at a few locations and spread into adjacent fencerows and roadsides. In Ky. its culms are up to 9 m tall and 4 cm wide (versus 5 m and 2 cm); internodes are mostly 30-40 cm (versus 20-30 cm) and less abruptly reduced towards the base, hairy (versus glabrous) and dull greenish with a yellowish stripe (versus uniformly yellowish to brownish); culm sheaths are glabrous (versus pubescent at base).

ALI AS. **HAB** f-8,6 D 4. **ABU** +4.

2811--Arundinaria gigantea (Walt.) Muhl.

Poaceae <Arundinarieae>: *Arundinaria gigantea* (macrosperma)

This southeastern species formerly grew in large "canebrakes" on bottomlands across most of the state, and, especially in the Bluegrass Region, on some fertile uplands. Further verification is needed from the thinly scattered remnants in some northern counties. Clearance for farmland, followed by browsing by livestock, has greatly reduced it (Gm, Anderson 1924, Beckner 1928, Campbell 1989). Flowering rarely occurs, but may be more frequent after dry years and near maxima of the 11 year sun-spot cycle (Campbell 1985, and continuing analysis).

A. appalachiana Triplett, Weakley & L.G. Clark has been recently described from the southern Appalachians (Tenn., N.C., Ala., Ga., S.C.), where it occurs in thin woods on seasonally dry acid soils (Triplett et al. 2006). In Tenn., *appalachiana* is known from the southern Cumberland Plateau just south of Ky. and Va. (D. Estes, pers. comm.). *A. tecta* (Walt.) Muhl. has been erroneously reported from Ky. (M), but it is restricted to the southeastern Coastal Plain from Md. to Miss.

The genus *Arundinaria* is reasonably restricted to the three North American species (Triplett & Clark 2010), but several East Asian species appear closely allied. The commonly cultivated garden escape, *Pseudosasa japonica* (Sieb. & Zucc. ex Steud.) Makino ex Nakai, is often confused with *Arundinaria* (FNA 24). It usually has one delayed dominant branch at each node, often about as thick as the culm (versus 1-3 subequal branches much narrower than the culm), and often outcurved from the culm; foliage leaves tend to be larger (ca. 15-35 x 1.5-5 cm versus 5-23 x 0.8-2 cm), usually glabrous and pale to glaucous below (versus glabrous or hairy and not at all glaucous); culm sheaths are persistent, lack auricles (versus usually present) and have dense, persistent bristly hairs (versus glabrous or sparsely pilose towards margins). **HAB** 8,7,6,4 D 4. **ABU** g9 s9 -4.

2812--*Zizaniopsis miliacea* (Michx.) Doell & Aschers.

Poaceae <Oryzae>: *Zizaniopsis miliacea*
This southeastern species can form large colonial patches in marshy sloughs and sluggish rivershores; 2n = 24. But in Ky., at the edge of its range, *Zizaniopsis* is known only from 3-5 localities, most needing better documentation.

HAB 2 ~ D 5. **ABU** g10 s3 -5.

2813--*Zizania palustris* L. var. *interior* (Fassett) Dore

Poaceae <Oryzae>: *Zizania palustris* var. *interior* (aquatica var. *interior*)

This species occurs mostly in marshes from New England through the Great Lakes region to the upper midwest; 2n = 30. C.W. Short made colls. (CINC, formerly KY, check PH) in 1835 from "lakes in the barrens of Ky.", probably in CHRI, TODD, LOGA or WARR. There is also a coll. from FULT (US) made in 1915. These colls. are probably all referable to the largely midwestern var. *interior*, which is generally more robust than typical *palustris*, but that needs to be checked.

HAB 2 ~ D 5. **ABU** g9 s0 -6.

2814--*Leersia lenticularis* Michx.

Poaceae <Oryzae>: *Leersia lenticularis*
This occurs mostly in swampy woods on base-rich soils of the Mississippi Valley (north to Wis.), and more locally on the Atlantic Coastal Plain (north to Md.).

HAB 6,3,9 D 4. **ABU** g9 s8 -3.

2815--*Leersia oryzoides* (L.) Sw.

Poaceae <Oryzae>: *Leersia oryzoides*
This is widespread in open base-rich wetlands across eastern and central North America.

HAB 2,1,3 D 4. **ABU** g10 s10 -3.

2816--*Leersia virginica* Willd.

Poaceae <Oryzae>: *Leersia virginica*
This widespread eastern species is most common in partial shade on damp to seasonally dry base-rich soils, especially along streambanks and on compacted ground along woodland trails.

Variation deserves further study. Several Ky. colls. are referable to var. *ovata* (Poir.) Fern., especially from western regions (CALL, CARL, FULT, HARD, HICK, LYON). That variety is distinguished by its more robust habit and bristly-ciliate lemma keels, suggesting a transition to *oryzoides*. It is not recognized in most recent treatments (FNA 24). Hybrids among North America species of *Leersia* are unknown, but all share 2n = 48.

HAB r-4,7,6 ::: D 3. **ABU** g10 s10 -2.

2817--*Brachyelytrum erectum* (Schreb. ex Spreng.) Beauv.

Poaceae <Brachyelytrae>: *Brachyelytrum erectum*
This is widespread in eastern North America, but generally restricted to medium acid soils in less disturbed, mesic to subxeric woods; 2n = 22.

Closely related plants are known in East Asia, but have been recently treated as a distinct species (see citations of W).

HAB 5,11,7 C 1. **ABU** g10 s10 -3.

2818--*Diarrhena americana* Beauv.

Poaceae <Diarrheneae>: *Diarrhena americana* (var. a.)

This mostly occurs in the Ohio Rv. watershed, centered on Ky. See notes under the largely midwestern species, *obovata*.

HAB 11,5 E 1. **ABU** g9 s9 -2.

2819--*Diarrhena obovata* (Gleason) Brandenburg

Poaceae <Diarrheneae>: *Diarrhena obovata* (*americana* var. o.)

The midwestern range of this species is centered on Mo., Iowa and Ill.

Although some initial identifications in Ky. have been tentative or erroneous (e.g. from PIKE), *obovata* is generally distinct from typical *americana* in its spikelets (with glabrous calluses, shorter lemmas, longer but abruptly beaked fruits). Intermediates have not been demonstrated; $2n = 60$ in *obovata* but still unknown in *americana* (FNA 24). Further records of *obovata* are expected in western regions, since it is known in adjacent north-central Tenn. (Ch, FNA 24).

HAB 5,7 E 1. **ABU** g8 s3 -3?

2820--*Piptatherum racemosum* Ricker ex A.S. Hitchc.

Poaceae <Stipeae>: *Piptatherum* [*Oryzopsis**] *racemosum*

In Ky. this northeastern species is known only from under limestone cliffs in the Kentucky River Palisades and in the eastern Knobs Region (or its Appalachian transitions). Segregation of *Piptatherum* from *Oryzopsis* (FNA 24) has been challenged (Y).

HAB 11,12 /+ D 2. **ABU** g8 s7 =.

2821--*Piptochaetium avenaceum* (L.) Parodi

Poaceae <Stipeae>: *Piptochaetium* [*Stipa*] *avenaceum*

This is a largely southeastern grass but it also occurs on sandy soils in the southern Great Lakes Region. It is locally abundant in open woods on the southern Cumberland Plateau of Ky. The disjunct western record from GRAY (KY) is confirmed; other disjunctions occur in s. Ohio, s. Ill. and w. Tenn. (FNA 24).

HAB 7,10,11,12 B 3. **ABU** g10 s7 -3.

2822--*Melica mutica* Walt.

Poaceae <Meliceae>: *Melica mutica*

This southeastern species is absent in the Ohio Rv. watershed north of the Ky. Rv. Palisades, western Knobs, and the central Appalachian Plateaus. Along this northern margin of the range, it occurs locally on warm slopes. To the south it is a locally common grass of mesic to subxeric woods (FNA 24).

HAB 11,7,10 D 3. **ABU** g9 s8 -2.

2823--*Melica nitens* (Scribn.) Nutt. ex Piper

Poaceae <Meliceae>: *Melica nitens*

This largely midwestern species is closely related to the southeastern *mutica*, which has often been confused. Hybrids are not reported but may be expected; $2n = 18$ in both species (as in most *Melica*). Their ranges overlap somewhat, especially in Ky., where *nitens* is much less common and restricted to more open base-rich slopes and glade margins.

HAB 12 +\ D 4. **ABU** g8 s6 -1.

2824--*Melica aristata* Thurb. ex Boland. W

Poaceae <Meliceae>: *Melica aristata*

This is a grass of mountains in the Pacific states. There is coll. from FAYE (KA): by Robert Beckner, 7-7-1975, "lawn, came in Kentucky bluegrass seed." It cannot be considered established in the state, and there are no other records from eastern North America.

ALI EU.

2825--*Schizachne purpurascens* (Torr.) Swallen

Poaceae <Meliceae>: *Schizachne* [*Melica*] *purpurascens* (*M. striata*)

This virtually monotypic genus is a distinct relative of *Melica*; $2n = 20$.

Typical *purpurascens* is widespread across boreal North America (FNA 24), usually in somewhat mesic woods. Closely related plants (known as ssp. *callosa*) are known in East Asia (Kowano & Koyama 1964). *S. purpurascens* is rare in unglaciated regions of eastern states. In Ky. it is known only from a remarkable disjunct cluster of sites along the Palisades of Ky. Rv., restricted to narrow points in thin xeric woods.

HAB 12,11 +\ E 3. **ABU** g10 s4 =.

2826--*Glyceria striata* (Lam.) A.S. Hitchc.

Poaceae <Meliceae>: *Glyceria striata* (*nervata*)

This widespread variable species occurs in wetlands across temperate and boreal regions of North America, but it is most common in cool temperate

zones. It is diploid ($2n = 20$). Other species in Ky. are tetraploids, but occasional triploid hybrids with *striata* are possible (FNA 24).

HAB 1,2,6 ~ D 3. **ABU** g10 s10 -2.

2827--*Glyceria melicaria* (Michx.) F.T. Hubbard

Poaceae <Meliceae>: *Glyceria melicaria* (torreyana)

This northeastern species extends south at high elevation in the Appalachians to n Ga. In Ky. it is largely restricted to acid boggy streamsides and seeps in cool sandstone ravines and in the Cumberland Mts.

HAB 6 B 3. **ABU** g9 s6 -2.

2828--*Glyceria acutiflora* Torr.

Poaceae <Meliceae>: *Glyceria acutiflora*

This species has a remarkable range in North America, with five largely disjunct centers: (1) lowlands of New England; (2) lowlands south of Lakes Erie and Ontario; (3) the Allegheny Mts.; (4) a zone from the Shawnee Hills to the southern Cumberland Plateau; and (5) the Ozark Mts. (FNA 24, K). Closely related plants (known as ssp. *japonica*) occur in East Asia (Koyama & Kowano 1964). Typical *acutiflora* occurs in similar habitats to *septentrionalis*, but generally on more acid soils in boggy non-alluvial ponds that tend to dry up in summer.

HAB 9,6,2 C 4. **ABU** g8? s4 -3.

2829--*Glyceria arkansana* Fern.

Poaceae <Meliceae>: *Glyceria arkansana* (*septentrionalis* var. a.)

This taxon occurs in the lower Mississippi Valley. Distinction from *septentrionalis* is tentative in some colls. from Ky. It may be better treated as var. *arkansana* (Fern.) Steyermark & Kucera; both are probably tetraploids with $2n = 40$ (FNA 24).

HAB 2,3,9 ~ D 4. **ABU** g8 s5? -3.

2830--*Glyceria septentrionalis* A.S. Hitchc.

Poaceae <Meliceae>: *Glyceria septentrionalis* (var. s.)

This is scattered over east-central states, but most common on glacial plains south of the Great Lakes. It generally grows in shallow ponds and swampy glades within wooded wetlands. See notes under *arkansana*, which can be hard to distinguish.

HAB 2,6,9 ~ D 4. **ABU** g9 s7 -3.

2831--*Torreyochloa pallida* (Torr.) Church

Poaceae <Poeae>: *Torreyochloa* [*Puccinellia*] *pallida* (*Glyceria* p.)

Typical *pallida* occurs mostly in marshy habitats of northeastern states and adjacent Canada. Closely related plants (varieties or subspecies) occur in western North America and East Asia (FNA 24, Kowano & Koyama 1964).

HAB 2,3 ~? D 4. **ABU** g9? s3 -3?

2832--*Puccinellia distans* (Jacq.) Parl.

Poaceae <Poeae>: *Puccinellia distans*

In Ky. this alien halophyte has been recorded only from BOON (KNK), along a salted interstate highway. It is spreading along such sites through much of cool temperate North America (Cr, FNA 24).

ALI EU. **HAB** R-10 ::? E 6. **ABU** +4.

2833--*Sclerochloa dura* (L.) Beauv.

Poaceae <Poeae>: *Sclerochloa dura*

Although present in North America since 1895, this short annual has been extensively documented only during recent decades. In Ohio it is widely known, especially at fair grounds and similar places (A. Cusick, pers. comm.). In Ky. *Sclerochloa* has been recently found in heavily trampled athletic fields and similar areas (Brandenburg & Thieret 1996), often with *Poa annua* and other annuals (all aliens except *P. chapmanniana* and *Veronica peregrina*).

ALI EU. **HAB** S-10 ::: D 6. **ABU** +4.

2834--*Lolium perenne* L.

Poaceae <Poeae>: *Lolium perenne* (var. p.)

This has been widely planted in North America for lawns, erosion-control and forage. In Ky. it did not become widely used until the 1930s or later (B). Some records mapped here may be from plantings.

ALI EU. **HAB** F-10,8 D 5. **ABU** +5.

2835--*Lolium multiflorum* Lam.

Poaceae <Poeae>: *Lolium multiflorum* (*perenne* var. *aristatum**)

This is closely related to *perenne*, and also widely planted in North America. It was first introduced into Ky. for trials a century ago (Gm), but did not become widely used until the 1930s or later (Anderson 1924; B). Several records mapped here are probably derived from plantings.

L. multiflorum can hybridize and intergrade with *perenne* (FNA 24); $2n = 14$ in all *Lolium* (the base number in *Poeae*). *L. multiflorum* differs in its more numerous florets per spikelets (10-22 versus 2-10), and the lemmas usually

with longer awns (up to 15 mm versus 8 mm). Also, leaf blades tend to be wider (mostly 3-8 mm versus 2-4 mm), and plants are usually annual (versus perennial).

ALI EU. **HAB** F-10,8 D 5. **ABU** +6.

2836--*Lolium temulentum* L.

Poaceae <Poeae>: *Lolium temulentum*

This Mediterranean weed is widely scattered in North America, but it does not seem to be established in Ky. There are only three known colls. of this species from the state, made during 1916-43 (all at KY-Agr.). It is easily confused with perenne (FNA 20, W), but differs in its annual life-cycle (versus perennial), longer glumes (usually 15-25 mm versus 4-12 mm) that exceed lemmas (versus shorter), and larger seeds (1-3 mm wide versus 0.7-1.5 mm).

ALI EU. **HAB** F-10 D 5. **ABU** +4<.

2837--*Festuca pratensis* Huds. T

Poaceae <Poeae>: *Festuca* <Schedonorus> *pratensis* ("elatiore"; elatiore var. p.)

This grass is reported to have been widely sown for turf and forage in humid temperate regions of North America (FNA 24). However, it has been much confusion with arundinacea, and this is no accurate published map of its range.

A more thorough review of Ky. colls. is needed, but virtually no verified material of *pratensis* has been located; see notes on identification under arundinacea. The first report of *pratensis* from Ky. was by Short et al. (1833), but no associated coll. has been located. Although seed of *pratensis* was distributed a century ago or more, it proved much less desirable than arundinacea (true elatiore) and other grasses. Based on trials in the 1890s, Gm noted: "in our plot, never spread from the lines in which seed was sown"; and its seed was much less highly priced than arundinacea (13 cents per pound versus 22-25 cents).

ALI EU. **HAB** F-10,8 D 5. **ABU** +5<.

2838--*Festuca arundinacea* Schreb.

Poaceae <Poeae>: *Festuca* <Schedonorus> *arundinacea* (elatiore; elatiore var. a; *S. phoenix*)

This "tall fescue" has been widely planted across temperate North America. In Ky. it was first used for initial trials during the 1890s, under the names *F. elatiore* L. and "English blue-grass" (Gm). Gm noted: "In the quality of durability we have nothing that surpasses it... It is frequently grown in this

part of the State, but is perhaps not made use of as much as it should be... It is both nutritious and palatable." During the 1930s, the Univ. of Ky. selected the cultivar known as "Kentucky 31" that became widely sown in the 1940s and 1950s, but its limitations for livestock eventually became apparent (Hoveland 2007). It is frequently impossible to distinguish planted from naturalized records. The taxonomy of arundinacea and *pratensis* has become clarified during recent decades (F, Cr, FNA 24, W). The two species were confused in older literature, but are now considered generally distinct.

F. arundinacea can be distinguished from *pratensis* by its ciliate auricles, slightly scabrid-hispid rachillas and lemma veins (versus usually glabrous); also, it typically has more strongly nerved to aristate lemmas, more branched panicles, wider glossier leaves, and taller overall height. It includes a polyploid series (2n = 28-70), while *pratensis* is only diploid (2n = 14). T. Phillips (Univ. of Ky., Dept. of Agronomy) has various living accessions of both species.

Alternative generic assignments include *Schedonorus* (a narrow concept) and *Lolium* (in a broad concept); hybrids between the *pratensis* group and *Lolium* spp. are documented in Europe. *S. phoenix* (Scop.) Holub has recently been adopted by PL to replace arundinacea, but the correct name should be *S. arundinaceus* (Schreb.) Dumort., according to M. Barkworth (online update for FNA 24).

ALI EU. **HAB** F-10,8 D 5. **ABU** +6*.

2839--*Festuca subverticillata* (Pers.) Alexeev

Poaceae <Poeae>: *Festuca subverticillata* (obtusata, "nutans")

This hexaploid (2n = 42) is widespread on fertile soils in moist to damp woods of eastern states, but it is rare on the southeastern Coastal Plain.

HAB 5,7,4 D 2. **ABU** g10 s10 -3.

2840--*Festuca paradoxa* Desv.

Poaceae <Poeae>: *Festuca paradoxa* (nutans, *shortii*)

This is well-known (e.g. FNA 24, Y, W) and locally abundant on base-rich soils in some midwestern regions (from Minn. to Tex.), and in southeastern coastal states (Miss. to Pa.). In the Ohio Rv. watershed *paradoxa* is much less frequent, but there are distinct native plants in the Mississippian embayment of s. Ill., sw. Ind. and w. Ky. Some eastern plants mapped here may just be adventive or at least transitional to robust open-grown *subverticillata*.

However, Aiken & Lefkovich (1993) showed that these two species are

generally distinct, with inconclusive evidence of hybridization. [A similar situation occurs in *Sphenopholis obtusata* versus *S. intermedia*.]

ALI w. **HAB** 10,8,7? D 4. **ABU** g9? s5? -4.

2841--*Festuca ovina* L. T

Poaceae <Poeae>: *Festuca ovina*

This name has generally been applied to *trachyphylla*, and it possible than virtually no true *ovina* occurs wild in Ky. or elsewhere in southeastern states. Typical *ovina* (2n = 14 and 28) has been introduced for turf in North America, but is no longer used regularly in the seed trade (FNA 24).

The segregated taxa, *F. filiformis* Pourr. ("hair fescue") and *F. glauca* Vill. ("blue fescue"), are widely grown in North America for turf or ornamental use, but are not known to have become established in the wild. See FNA 24 for notes on these and other potentially introduced taxa.

ALI EU.

2842--*Festuca trachyphylla* (Hack.) Krajina

Poaceae <Poeae>: *Festuca trachyphylla* ("duriuscula"; "ovina"*)

This alien is a hexaploid (2n = 42) that has often been sold under the names "sheep's fescue" or "hard fescue" as a durable turf grass and soil stabilizer (FNA 24). Mapped colls. here may come from truly naturalized plants, but persistence from plantings cannot be ruled out. There has been much confusion with *ovina* and *rubra*, and further checking of identifications may be needed. *F. trachyphylla* differs from *ovina* in its more distinctly ribbed blades and its generally larger spikelets; see FNA 24 for details.

ALI EU. **HAB** F-10,12 D 5. **ABU** +4.

2843--*Festuca rubra* L.

Poaceae <Poeae>: *Festuca rubra* (ssp. r.)

The alien or native status of this widespread variable northern (circumboreal) species in Ky. is somewhat unclear; 2n = 28-70. Also, there has been confusion with *trachyphylla* and *ovina*. In Ky. *rubra* has been widely sown for forage and turf since before 1900, when Gm noted that its seed was as almost as highly priced (at 20 cents per pound) as *arundinacea*. Colls. from BULL, MCRE (KY) and elsewhere may be from plantings. However, colls. from CUMB and FRAN (KY) in cliff-top woods appear to be native or thoroughly naturalized. There may also be a ca. 1830 coll. of C.W. Short from "Ky Rv cliffs, hanging over rocky precipice" (originally filed under *F.*

duriuscula at PH). F and Cr stated that *rubra* appears native in more northern and coastal regions; see also ssp. *pruinosa* (Hack.) Piper in FNA 24.

F. rubra is distinguished from *trachyphylla* and *ovina* by its more rhizomatous habit. Its sheaths are closed for at least 3/4 of their length (versus less than 2/3), usually retrose-hairy (versus glabrous), and older ones shred into fibers (versus persistent for several years without much shredding). Also, its spikelet dimensions are generally larger (FNA 24).

ALI m. **HAB** F-10,12 D 5. **ABU** g10 s4? +4?

2844--*Vulpia octoflora* (Walt.) Rydb. var. *octoflora*

Poaceae <Poeae>: *Vulpia* [*Festuca*] *octoflora* var. *o.* (*aristulata*)

This taxon is reportedly widespread in temperate North America and adventive elsewhere in the World (FNA 24). However, variation deserves more study. Distinction from var. *tenella* needs further attention, and several assignments remain uncertain. See also note on var. *hirtella* under *V. sciurea*.

HAB h-10,12 ::+ C 6. **ABU** g9 s8? -2?

2845--*Vulpia octoflora* (Walt.) Rydb. var. *tenella* (Willd.) Fern.

Poaceae <Poeae>: *Vulpia* [*Festuca*] *octoflora* var. *tenella* (*glauca*)

Most colls. of *octoflora* from Ky. may be referable to this northern taxon. However, several need to be rechecked for var. *octoflora* (including var. *aristulata* Torr. ex L.H. Dewey). The priority of var. *tenella* over var. *glauca* (Willd.) Fern. has recently been established by Allred (2008).

HAB h-10,12 ::+ C 6. **ABU** g10 s9 -2?

2846--*Vulpia bromoides* (L.) S.F. Gray

Poaceae <Poeae>: *Vulpia* [*Festuca*] *bromoides* (*F. dertonensis*)

This alien is widely scattered in southeastern states and more frequent in western states. In Ky. it appears largely restricted to acid sandy soils.

ALI EU. **HAB** H-10 ::: B 6. **ABU** +4.

2847--*Vulpia sciurea* (Nutt.) Henrard R

Poaceae <Poeae>: *Vulpia* [*Festuca*] *sciurea* (*elliotea*)

This occurs mostly on the southeastern Coastal Plain in dry sandy soils, north perhaps to s. Mo., and no records from Ky. are verified. There has been confusion between *sciurea* (2n = 42) and *octoflora* (2n = 14), especially in Tenn., Ky. and Mo. Treatments have been somewhat inconsistent (e.g. Y versus FNA 24). In Ky. colls. initially named *sciurea* (or *elliotea*) from GRAV (MUR) and MCRA (SIU) appear to be *octoflora* instead. A coll. to support the

report by Woods (1983) from CALL has not been located. D. Estes (pers. comm.) has recently determined that some colls. named sciurea from w. Tenn. and w. Ky. approach *V. octoflora* var. *hirtella* (Piper) Henrard, which occurs widely across western and northern states and adjacent Canada (FNA 24).

2848--*Vulpia myuros* (L.) K.C. Gmel.

Poaceae <Poeae>: *Vulpia* [Festuca] *myuros*

This alien occurs widely in southeastern and western states. It is more common than *bromoides*, and less concentrated on strongly acid soils. Variation may need further study; $2n = 14$ and 42 (FNA 24).

ALI EU. **HAB** H-10 ::: C 6. **ABU** +4.

2849--*Poa trivialis* L.

Poaceae <Poeae>: *Poa trivialis*

F indicated native status for this species in North America, at least to the north, but R. Soreng (in FNA 24) considered it all introduced from Europe. Further clarification could come from research into early colls. and any records of planting for pasture. Anderson (1924) noted: "rare in Kentucky, and perhaps not established." *P. trivialis* is now locally abundant in thin woods along streams, especially in the Bluegrass Region and other areas with fertile soils. It is the only simple diploid *Poa* ($2n = 14$) known in eastern North America; most species are tetraploids or have polyploid series.

ALI m? **HAB** f-4,6,7 E 4. **ABU** g10 s8? +2?

2850--*Poa autumnalis* Muhl. ex Ell.

Poaceae <Poeae>: *Poa autumnalis*

This southeastern species is scattered across much of Ky., especially in submesic woods on non-calcareous soils. It is virtually absent in states to the north and west, except for the Shawnee Hills of s. Ill. and s. Ind. (PL). In Ky. it usually flowers during May, about the same time as *sylvestris*; there are no records from July onwards.

HAB 7,5,11 C 2. **ABU** g9 s8 -3.

2851--*Poa sylvestris* Gray

Poaceae <Poeae>: *Poa sylvestris*

This is widely scattered in mesic woods on fertile soils in eastern states, but concentrated from mid-Atlantic to Ozarkian regions.

HAB 7,5,4 D 2. **ABU** g10 s10 -3.

2852--*Poa nemoralis* L. R

Poaceae <Poeae>: *Poa nemoralis*

This alien is locally naturalized in some northern regions, including parts of states to north and east of Ky. It has been reported from Ky. (Anderson 1924, Rogers 1941, FNA 24), but there have been misidentifications, and its occurrence remains dubious (M). A coll. was made in FAYE (KY Agr. Sch.) during 1894, probably from early planted trials of Gm.

ALI EU.

2853--*Poa cuspidata* Nutt.

Poaceae <Poeae>: *Poa cuspidata* (brachyphylla)

This largely Appalachian species extends west along the Kentucky River Palisades to JESS and MERC, and along the southern Knobs to TAYL. Also, there is only an old record in Ind. from Floyd Co., across the Ohio Rv. from MEAD (D). *P. cuspidata* is a rhizomatous species that flowers relatively early, usually in April, and it is easily overlooked.

HAB 11,5 C 2. **ABU** g9 s9 -2.

2854--*Poa alsodes* Gray

Poaceae <Poeae>: *Poa alsodes*

In Ky. this northeastern species is currently known only from Appalachian regions. The outlying 1893 record of Pr from WARR or EDMO has not been confirmed, but need not be doubted. There are other disjunct records of *alsodes* from s. Ill., s. Ind. and sw. Ohio (FNA 24, K).

HAB 8,7,10,4 :: B 4. **ABU** g8 s7 -2.

2855--*Poa languida* A.S. Hitchc.

Poaceae <Poeae>: *Poa languida* (saltuensis ssp. l.)

This is an uncommon species from mid-Atlantic to upper mid-western states (Va. to Minn.), usually on somewhat base-rich soils. In Ky. it is known only from thin woods and glade margins in foothills of the eastern Knobs, generally on or near dolomitic soils. *P. languida* has been treated as a species (F, W), subspecies (FNA 24), or insignificant variant (K) of *saltuensis*. *P. saltuensis* is a more widespread species of northeastern states and adjacent Canada, often on more acid soils; *languida* occurs along its southern and western borders.

HAB 12,10 D 3. **ABU** g7 s3 -3.

2856--*Poa bulbosa* L.

Poaceae <Poeae>: *Poa bulbosa*

This alien is established across most of the U.S.A., especially western regions, but it remains rare to absent in southeastern states. Although widely scattered in Ky., records are few and mostly date from 1920-1950. *P. bulbosa* is a variable species; $2n = 14$ to 45 (FNA 24). In addition to having bulbous culm bases, most plants in North America have bulbiferous (viviparous) spikelets and are referable to *ssp. vivipara* (Koel.) Archang. Plant with non-bulbiferous spikelets are known only from Ohio (FNA 24).

ALI EU. **HAB** R-10? :: D 6? **ABU** +4<

2857--*Poa pratensis* L.

Poaceae <Poeae>: *Poa pratensis* (var. p.)

This is a widespread circumboreal species, or species-complex, with a great range in chromosome number; $2n = 27$ to 147 . Many variants have been recognized (FNA 24); see also notes under *angustifolia*. Some plants in northern states and Canada have been considered native (F), and there are clearly native segregates typical of boreal and alpine regions (Stoneberg-Holt 2003). But it remains unclear if any plants occurred in more central to southern states before European settlement. In Ky. *pratensis* has been widely planted for pasture and lawns since the period of Virginian settlement, using seed derived from Europe, and it prospered on fertile calcareous soils.

ALI EU. **HAB** G-10,8,4? D 4. **ABU** +6.

2858--*Poa angustifolia* L.

Poaceae <Poeae>: *Poa angustifolia* (*pratensis* var./ssp. a.)

This is considered native to a large region of western Eurasia, and it is now widely scattered in temperate North America (F, FNA 24). The taxon may be better treated as *P. pratensis* ssp. *angustifolia* (L.) Lej., as in FNA. It is highly variable, with $2n = 28$ to 83 , but low ploidies predominate. In Ky. such plants are frequent in old-fields, especially within the Bluegrass region. Gm noted: "Bluegrass is a variable plant. In open pastures where the turf is long-established it is often of a pure green color, with narrow, slightly folded blades..."

These plants differ from typical *pratensis* in their more densely tufted habit (less turf-forming) and leaf blades that are only 0.4-1 mm wide, even in well-grown plants (versus up to 1.5-4.5 mm). Aso blades tend to be involute and often have sparse hairs (versus rarely).

ALI m? **HAB** g-10,8 D 4. **ABU** g10? s8? +3?

2859--*Poa compressa* L.

Poaceae <Poeae>: *Poa compressa*

In North America, this variable species ($2n = 35$ to 84) is generally thought to be introduced from Europe (FNA 24). However, some botanists have suggested native status to the north (e.g. in the alvars of Ontario), and the common name "Canadian bluegrass" is puzzling.

ALI EU. **HAB** R-10,8,11,12 :: D 5. **ABU** +6.

2860--*Poa annua* L.

Poaceae <Poeae>: *Poa annua*

This weedy alien annual is widespread across temperate North America, except in arid regions. It has probably been present in Ky. since early after settlement. Anderson (1924) listed a coll. of R. Peter from Lexington in 1834, noted "common" (at KY before fire). *D. glomerata* is a variable species ($2n = 14$ to 42), and several cultivars have been developed, but taxonomic segregates are not generally recognized (FNA 24).

ALI EU. **HAB** S-10,8 ::: D 6. **ABU** +6.

2861--*Poa chapmaniana* Scribn.

Poaceae <Poeae>: *Poa chapmaniana*

This native annual is widely scattered in open disturbed areas on medium acid soils across southeastern states, but with records concentrated in the Carolinas, s. Ill. and Mo. (FNA 24, K). It is often overlooked or confused with *annua*. In Ky. most records come from in or near former "barrens" of western regions, and from dry sandy terraces of the Ohio Rv. or its tributaries.

HAB H-10,8 ::: C 6. **ABU** g9 s8 -3?

2862--*Dactylis glomerata* L.

Poaceae <Poeae>: *Dactylis glomerata*

This popular forage ("orchard grass") was probably introduced early after settlement. It has been a favorite grass for hayfields and pastures, with some tolerance of thin shade (Gm).

ALI EU. **HAB** F-10 D 4. **ABU** +6.

2863--*Sphenopholis nitida* (Biehler) Scribn.

Poaceae <Aveneae>: *Sphenopholis nitida*

This is widespread across eastern states, except in the upper midwest. It is typical of moderately dry woods on acid soils, being rare to absent on more base-rich soils.

HAB 11,7,5 B 3. **ABU** g9 s9 -2.

2864--Sphenopholis intermedia (Rydb.) Rydb.

Poaceae <Aveneae>: *Sphenopholis intermedia* (?*pallens*; *obtusata* var. *major**)

This is a widespread North American species that usually grows on fertile soils in woodland with moderate stress or disturbance (see also: FNA 24). A few colls. (e.g. from GRAV at WKY) may be transitional to typical *obtusata*, but *intermedia* is generally quite distinct.

There has been much confusion among the species of *Sphenopholis* in Ky., and a more detailed key is still needed (e.g. based on F); $2n = 14$ in all three cases. According to FNA 24, the name *S. pallens* (Biehler) Scribn. is applicable to supposed hybrids of *pensylvanica* and *obtusata* (or perhaps *intermedia*). However, records of *pallens* from Ky. (Anderson 1924, RAB) are probably all referable to *intermedia* (M).

HAB 7,6,4,5 D 3. **ABU** g10 s9 -3.

2865--Sphenopholis obtusata (Michx.) Scribn.

Poaceae <Aveneae>: *Sphenopholis obtusata* (var. o.)

This is widespread in western and southern regions of North America, and probably occurred in native grasslands of w. Ky. before settlement, but its original distribution is somewhat uncertain. *S. obtusata* is now generally uncommon, even in good grassland remnants, but it seems to have spread locally along roads and railroads into more eastern regions. It often appears to behave as an annual, unlike other species in the genus. Some plants have been referred var. *lobata* (Trin.) Scribn. and var. *pubescens* (Scribn. & Merr.) Scribn., but these taxa are not generally recognized in recent treatments (e.g. FNA 24). See also *S. intermedia*, which has been confused.

ALI w. **HAB** f-10,8,12 D 4. **ABU** g10 s8 -3?

2866--Sphenopholis pensylvanica (L.) A.S. Hitchc.

Poaceae <Aveneae>: *Sphenopholis pensylvanica* ("*pallens*"; *Trisetum* pen.)

This occurs mostly on damp acid soils in states east of the Mississippi and Ohio Rivers, and is concentrated in mid-Atlantic states (FNA 24, K). There are only about three sites currently known in Ky. Hybrids with *obtusata* (*sensu lato*) have been reported across its range, but see note on *pallens* under *intermedia*.

HAB 6,9 B 4. **ABU** g8 s3 -4.

2867--Koeleria macrantha (Ledeb.) J.A. Schultes

Poaceae <Aveneae>: *Koeleria macrantha* (*cristata*, *pyramidata*)

This is a widespread, variable, circumboreal species of cool dry grasslands, usually on sandy soils; it is virtually absent in southeastern states (FNA 24, K). The only known site for *Koeleria* in Ky. is near Mantle Rock in LIVI, where discovered by R. Athey (MUR). The species varies significantly across its range; $2n = 14$ and 28. North American plants are sometimes segregated as *K. nitida* Nutt., but further research is needed (FNA 24).

HAB 12 C 4. **ABU** g10 s2 -3?

2868--Phalaris canariensis L.

Poaceae <Aveneae>: *Phalaris canariensis*

Seed of this Mediterranean annual has been imported to feed canaries and other birds for a century or more in Ky. (Gm; Anderson 1924), as elsewhere in North America. The few Ky. colls. may just represent waifs from spilled or discarded seed. *P. canariensis* is similar to *caroliniana*, but with larger florets that have distinctive "almost semicircular," mucronate exposed ends of glumes (versus acute to acuminate); $2n = 12$ versus 14 (FNA 24).

ALI EU. **HAB** F-10 ::? D 6. **ABU** +4.

2869--Phalaris caroliniana Walt.

Poaceae <Aveneae>: *Phalaris caroliniana*

During the Woodland era, this widespread southern annual appears to have been widely used for its edible seed in the central Mississippi and Ohio Valleys, based on analysis of archaeological sites. However, it is now uncommon in southeastern states except on base-rich soils of the Gulf Coastal Plain. The few Ky. colls. are mostly from broad river terraces in western regions, with almost none dated after 1970; see colls. of R. Athey (mostly at MEM). Archaeological sites include several in the Red River area of MENI and nearby, where the species is completely unknown today (Ford 1985).

There is no evidence of human selection for seed size or other characters.

HAB F-10,9,8? ::? D 6. **ABU** g10 s4 -5.

2870--Phalaris arundinacea L.

Poaceae <Aveneae>: *Phalaris arundinacea*

This is a widespread, variable, circumboreal species; $2n = 27-35$ (FNA 24). It has been considered native in parts of Ohio, Ky., Ill., Ind. and Tenn. (Braun 1967; B, Ch, D, F, J, SC, Sm), but there has been uncertainty about its status in parts of the Ohio Valley (Lyons 2010). It is certainly native further north and west in North America, but European cultivars have been introduced for forage and soil stabilization, probably interbreeding with native races (Merigliano & Lesica 1998; Lavergne & Molofsky 2007). The species is often

considered invasive in wetlands, whether native or alien; but is this behavior partly due to reduction of beavers and other herbivores in such habitats?

In Ky. *P. arundinacea* was first reported by Riddell (1835; as "americana Ell."), but was omitted by Anderson (1924) and rarely collected before the 1970s. It is locally abundant along marshy margins of large or small streams and in remnants of natural wetlands, especially with eutrophic conditions. But it also occurs in mined areas, roadside ditches or similar disturbed sites with no clear presettlement heritage.

There is little or no recent record of planting for forage or other purposes, but seed was apparently distributed for sale a century or more ago. Gm stated: "a persistent perennial, the seeds of which are frequently brought into this country from Europe, but believed native to the United States." He conducted trials for forage at the Univ. of Ky. ca. 1894-1899, with mixed results, and noted: "adapted to rather low wet ground... it can be made useful in binding the soil of embankments." The European cultivar known as "ribbon-grass" or *forma variegata* (Parnell) Druce occasionally persists or escapes from gardens. **ALI** m. **HAB** f-9,6,2 D 5. **ABU** g10 s9? -2?

2871--*Anthoxanthum aristatum* Boiss. W

Poaceae <Aveneae>: *Anthoxanthum aristatum*

This is uncommon in North America, being scattered over southeastern, Atlantic and Pacific states. In Ky. it has been collected by Abbott et al. (2001) from TRIG (BEREA), at the entrance to the Elk-Bison exhibit at Land-Between-the-Lakes, where various grasses have been seeded. *A. aristatum* may have been introduced by accident along with such seeding.

ALI EU. **HAB** F-10 C 5.

2872--*Anthoxanthum odoratum* L.

Poaceae <Aveneae>: *Anthoxanthum* (*Hierochloa*) *odoratum*

This alien is widely scattered across eastern North America, but strongly concentrated in Appalachian regions and New England. It is also common in the Pacific northwest. In Ky. it was first noted by Short (1840): "becoming gradually naturalized in our meadows."

A. odoratum and *A. aristatum* include diploids ($2n = 10$) and tetraploids, but only tetraploids are known in North America (FNA 24). The related species, *A. hirtum* (Schrank.) Y. Schouten & Veldkamp, is a circumboreal polyploid

($2n = 56$). That species has been erroneously reported from Ky. by M, K and others, based on a misidentified coll. of *Poa cuspidata* at EKY.

ALI EU. **HAB** F-10 C 5. **ABU** +5.

2873--*Holcus lanatus* L.

Poaceae <Aveneae>: *Holcus lanatus*

This diploid ($2n = 14$) alien is widely distributed in eastern North America and in humid western regions, especially on medium-acid soils. To the east it is concentrated in Appalachian and mid-Atlantic regions. The first records from Ky. were colls. by T.H. Kearney and Gm during the 1890s (Anderson 1924). It gradually became widespread, but it is not often abundant.

ALI EU. **HAB** F-10,8,6 C 5. **ABU** +5.

2874--*Deschampsia glauca* Hartm. ?

Poaceae <Aveneae>: *Deschampsia* cf. *glauca* (*cespitosa* var. g.)

This taxon may have a broad range in North America, except for the southeast, whereas typical *cespitosa* mostly occurs in more western regions (F, W). In Ky. "glauca" is known only from alluvial crevices in rocky limestone banks of the Kentucky Rv. along the central Palisades.

Compared to typical *cespitosa*, these plants have smaller overall dimensions (including the diagnostic ligule of F and W) and they occur in more base-rich habitats, at least on the south side of their range. However, the name "glauca" is provisional and may be illegitimate (FNA 24). There has not yet been a comprehensive modern revision of the *cespitosa* complex, with all its potential segregates; $2n = 18$ to 52 in the complex, with some aneuploidy. An initial study in arctic regions by Chiapella et al. (2011) has supported recognition of *glauca* as *D. cespitosa* (L.) P. Beauv. ssp. *glauca* (Hartm.) C. Hartm, along with several other segregates.

HAB 1 D 5. **ABU** g10 s2 -3?

2875--*Avenella flexuosa* (L.) Drejer

Poaceae <Aveneae>: *Avenella* [*Deschampsia**] *flexuosa*

This is a remarkably widespread, variable species of humid, cool temperate and boreal regions of northeastern North America, Central to South America, Eurasia and New Zealand; $2n = 14$ to 42 . Intraspecific taxa are not generally recognized. Recognition of *Avenella*, as a monotypic segregate of *Deschampsia*, is supported by recent molecular analysis (Garcia-Suarez et al. 1997; Chiapella 2007; see also W).

HAB 11 B 2. **ABU** g10 s4 =.

2876--*Avena fatua* L.

Poaceae <Aveneae>: *Avena fatua*

This weed ranges widely over cool temperate regions of North America. It is close to *sativa* (the cultivated oats), which was originally selected from *fatua*, and it can intergrade; $2n = 42$ in both taxa. Some colls. need rechecking.

ALI EU. **HAB** H-10 ::: D 6. **ABU** +4.

2877--*Avena sativa* L. C

Poaceae <Aveneae>: *Avena sativa*

This commonly grown grain (oats) is widely sown and naturalized in temperate regions of North America. Most Ky. colls. are probably from sowings that may self-seed for a year or two.

ALI EU.

2878--*Arrhenatherum elatius* (L.) Beauv. ex J.& K. Presl

Poaceae <Aveneae>: *Arrhenatherum elatius*

In North America, this alien occurs mostly in cool temperate regions of eastern and western states, plus adjacent Canada. It was introduced to Ky. at least a century ago, and considered exceptionally useful. Gm noted: "Among 40-50 forage plants kept growing at the Ky. Experimental Farm for a number of years, this has always, winter and summer, been one of the finest in appearance..." It was widely cultivated through the 1920s (Anderson 1924). However, it has now become generally uncommon to rare, since its agricultural role has been replaced by *Festuca arundinacea*.

The coll. from SIMP (KY-Agr.) has been referred to var. *bulbosum* (Willd.) Spenner, and needs to be investigated further. In that taxon, culm nodes are relatively hairy, and those at the base of the plant are distinctly swollen; it is not well documented in North America (FNA 24).

ALI EU. **HAB** F-10,8 D 5. **ABU** +5<.

2879--*Apera spica-venti* (L.) Beauv.

Poaceae <Agrostideae>: *Apera* [*Agrostis*] *spica-venti*

This alien is "sparingly introduced in waste place" across northeastern regions (Cr), but it does not seem to be spreading much in Ky. or other southern states. The only known Ky. coll. is from a weedy roadside in CAMP (KNK).

ALI EU. **HAB** H-10 ::? D 6? **ABU** +4.

2880--*Agrostis capillaris* L. C

Poaceae <Agrostideae>: *Agrostis capillaris* (*tenuis*; *alba* var. *vulgaris*)

In North America, this largely European tetraploid ($2n = 28$) is commonly sown for lawns and other sites designed for short mowed grass, especially in cool temperate regions of northeastern states. In Ky. *capillaris* does not appear to be established in the wild, but there are a few scattered records (BALL, ESTI, ROWA) that need further verification (M).

ALI EU.

2881--*Agrostis stolonifera* L. var. *palustris* (Huds.) Farw.

Poaceae <Agrostideae>: *Agrostis stolonifera* var. *palustris* (*alba* var. *p.*)

This variable species is widespread in northern (circumboreal) and western regions of North America; $2n = 28, 35, 42$ (FNA 24). It is supposedly native in northern states, but perhaps not in Ky. (F, FNA 24). Records from Ky. may be largely based on persistent or escaped plantings for lawns, especially greens for golf-courses. Most of the colls. mapped here as var. *palustris* appear distinct from var. *stolonifera* (which has shorter stolons, shorter leaves, and more open panicles), but further checking is warranted. The coll. from EDMO (WKY) may be var. *stolonifera*. There has also been much confusion with *A. gigantea*; see notes under that species.

ALI m. **HAB** f-9,10? ::? D 5? **ABU** g10 s6 -3?

2882--*Agrostis stolonifera* L. var. *stolonifera* T

Poaceae <Agrostideae>: *Agrostis stolonifera* var. *s.* (*alba* var. *a.*)

See notes under var. *palustris*.

ALI m.

2883--*Agrostis gigantea* Roth

Poaceae <Agrostideae>: *Agrostis gigantea* ("*alba*"; *stolonifera* var. *major*)

This grass ("*redtop*") has been widely planted and naturalized in temperate regions of North America. No doubt introduced to Ky. early after settlement, *gigantea* became a "valuable pasture grass, cultivated extensively, and growing wild in all parts of the state" (Anderson 1924). See also Short et al. (1833), Gm and other early records under various synonyms (M).

There has been some continuing confusion between *gigantea* with *stolonifera* in North America; see irregularities between state maps of FNA 24, K, PL and others. *A. gigantea* is a more robust plant with rhizomes (versus stolons), generally taller culms (2-12 dm versus 1-6 dm), and larger panicles (8-30 cm long versus 2-20 cm) with longer lower branches (4-9 cm versus 2-6 cm); $2n = 42$ (versus 28, 35 or 42).

ALI EU. **HAB** F-10,9,8,6 D 5. **ABU** +6.

2884--*Agrostis exarata* Trin. W

Poaceae <Agrostideae>: *Agrostis exarata*

This is a variable species of northwestern North America; $2n = 28, 42, 56$ (FNA 24). It has been collected from a stripmine bench in LESL (JC for KY), but it is probably not truly naturalized. It was probably a waif in plantings of other seed for reclamation.

ALI W.

2885--*Agrostis elliottiana* J.A. Schultes

Poaceae <Agrostideae>: *Agrostis elliottiana*

This is a somewhat weedy annual; $2n = 28$. It is widely scattered across southeastern states, but most common west of the Mississippi Rv. In Ky it may be partly adventive, but the species does not seem to be increasing; most records date from 1930-1980 (M).

HAB h-12,10 :::: C 6. **ABU** g9 s8 -2.

2886--*Agrostis hyemalis* (Walt.) B.S.P.

Poaceae <Agrostideae>: *Agrostis hyemalis* (var. h.; "scabra")

This widespread weedy eastern species is perennial or annual; $2n = 28$. It has been confused with scabra in earlier literature. See FNA 24 and W for details.

HAB f-10,12 C 6. **ABU** g9 s9 -2.

2887--*Agrostis scabra* Willd.

Poaceae <Agrostideae>: *Agrostis scabra* (hyemalis var. tenuis/scabra)

This close relative of hyemalis is widespread in cool temperate and boreal regions of North America, also in East Asia; $2n = 42$. It is known from CALL (EKY) and probably other colls. to be located and verified (LOGA, ?MADI, TODD, WARR; see M for details). However, some reports have been based on misidentifications of perennans. The key in F has been misleading; the "copiously spinulose-scabrous" panicle branches of scabra and hyemalis are usually distinct from the "slightly scabrous" or "scabridulous" (FNA 24) branches of perennans, but the other diagnostic differences should be sought as well.

2888--*Agrostis perennans* (Walt.) Tuckerman

Poaceae <Agrostideae>: *Agrostis perennans* (var. p., intermedia)

This hexaploid ($2n = 42$) is widespread in eastern North America. But it is less common on the southeastern Coastal Plain, where largely replaced by the

more robust segregate, *A. altissima* (Walt.) Tuckerman (= *A. elata* Trin.). Some colls. from CARL and FULT are referable to *A. perennans* var. *aestivalis* Vasey, but that taxon has not been recognized in recent treatments (FNA 24).

A. altissima has been reported from Ky. under various names by Kearney (1893) and others (M), but no colls. have been located. It occurs in bogs on the Coastal Plain from N.J. to Fla. to se Miss. and is very unlikely to occur in Ky. (W). Kearney (1893) also described *A. intermedia* Kearney from BELL or HARL, but the type (at Ohio State Univ.) is not distinct from perennans, and he did not list perennans.

HAB 7,11,5 :: C? 3. **ABU** g10 s10 -2.

2889--*Polypogon monspeliensis* (L.) Desf. W

Poaceae <Agrostideae>: *Polypogon monspeliensis*

This widespread variable weed originates from the Mediterranean region, It has become widely established across southern states, especially in waste places (Cr, FNA 24). The only Ky. coll. is from a greenhouse in BOUR (KNK; M, J).

ALI EU.

2890--*Cinna arundinacea* L.

Poaceae <Agrostideae>: *Cinna arundinacea*

This is widespread in wet riparian woodlands of most eastern states, but it is less common to absent on the southeastern Coastal Plain.

HAB 6,4,9 C 3. **ABU** g10 s10 -3.

2891--*Cinna latifolia* (Trev. ex Goepf.) Griseb. R

Poaceae <Agrostideae>: *Cinna latifolia*

This northern (circumboreal) species is not confirmed in Ky. It extends south to Tenn. and N.C., but only at high elevation (W). A putative coll. from BELL (TENN) has lost its inflorescence. Colls. reported (M) from LETC may be accessed at WKU and NCU (or Duke Univ.).

2892--*Calamagrostis cinnoides* (Muhl.) W.P.C. Barton

Poaceae <Agrostideae>: *Calamagrostis cinnoides* (coarctata)

This occurs mostly in wet acid soils from the mid-Atlantic coastal plain to the Appalachian Plateaus. The name *C. coarctata* (Torr.) Eat. has priority, but a proposal for conservation of *cinnoides* is pending (FNA 24; W).

HAB 6,9 B 4. **ABU** g8 s7 -3.

2893--*Calamagrostis insperata* Swallen

Poaceae <Agrostideae>: *Calamagrostis insperata* (porteri ssp. i.)

This globally rare grass occurs at several localities in the Ozarks of Mo., plus scattered disjunct sites in Ark., Ill., Ind., Ky. and Ohio (FNA 24, K, Y; M. Homoya, pers. comm.). It is often treated as *C. porteri* ssp. *insperata* (Swallen) C.W. Greene, but there is little overlap in range with typical *porteri*. The two taxa do occur within 50 miles of each other in the Knobs of Ind., Ky. and Ohio, with *insperata* generally on more xeric calcareous sites.

In Ky., no flowering has been observed in *insperata*, but comparison of vegetative material with authentic specimens from Ohio does support the identification. *C. insperata* is glabrous on the sheath collar (versus densely hairy); blades are light green and somewhat glaucous on both sides (versus darker green and smoother below); $2n = 56$ (versus 84-104).

HAB 12 +\ D 2. **ABU** g5 s2 -1?

2894--*Calamagrostis porteri* Gray

Poaceae <Agrostideae>: *Calamagrostis porteri* (ssp. p.)

This is largely Appalachian, with concentration in or near the Alleghenies and Blue Ridge, from N.Y. to Ala. It occurs mostly in thin, rocky, subxeric woods on non-calcareous soils. Flowering is rare, but has been observed along power-line rights-of-way in Ky. (colls. of A. Risk for MDKY; Campbell et al. 1992). See notes under *insperata*. The report by Pr from WARR (K) is dubious; no coll. has been located and "*Calamagrostis porteri*" is crossed out by hand in the author's copy (in archives at MO).

HAB 12,11 C 2. **ABU** g6 s4 -1?

2895--*Calamagrostis canadensis* (Michx.) Beauv.

Poaceae <Agrostideae>: *Calamagrostis canadensis*

This is a widespread variable species of marshy grasslands in cool temperate and boreal regions of North America. The only Ky. record is from wet meadows in BALL (EKY), where it was collected by R. Athey in the 1970s but not seen since. This coll. has been referred to var. *macouniana* (Vasey) Stebbins, but treatment of intraspecific taxa in *canadensis* remains challenging; $2n = 28$ to 66.

HAB 9,3,2 D 4. **ABU** g9 s1 -3?

2896--*Alopecurus myosuroides* Huds. C

Poaceae <Agrostideae>: *Alopecurus myosuroides* (agrestis)

This weedy alien annual is "occasionally found in fields and waste places at scattered stations" in northeastern states (Cr); $2n = 14$ and 28 (FNA 24). It does not appear to be increasing in Ky. There are only two colls., both from FAYE (KY-Agr. Sch.), dated 1890 and 1894, probably from plantings at the Agricultural Experiment Station (Anderson 1924).

ALI EU.

2897--*Alopecurus carolinianus* Walt.

Poaceae <Agrostideae>: *Alopecurus carolinianus*

This annual diploid ($2n = 14$) is widespread across the U.S.A., but most common in the Mississippi Rv. watershed. In earlier literature, it appears to have been misidentified as *geniculatus*; see notes under *aequalis*.

HAB F-10,8 ::? D 6? **ABU** g10 s8 -3?

2898--*Alopecurus aequalis* Sobol.

Poaceae <Agrostideae>: *Alopecurus aequalis* (*geniculatus* var. a.)

This is a northern and western (circumboreal) species, also known from Ohio, Ind., Ill. and Mo. (FNA 24). The single Ky. record is a verified coll. from CARL (MUR): L.M. Wilson #1568. The more northern (circumboreal) perennial, *A. geniculatus* L., is closely related, with $2n = 28$ (versus 14 or 28 in *aequalis*). *A. geniculatus* has been erroneously reported from Ky. (Short et al. 1833; Gm; Anderson 1924), apparently based on early taxonomic confusion.

HAB F-10 ::? D 5. **ABU** g10 s2 -4?

2899--*Alopecurus arundinaceus* Poir. W

Poaceae <Agrostideae>: *Alopecurus arundinaceus*

This tetraploid ($2n = 26-30$) has rarely been found in North America. It has been collected once in Ky., on a revegetated stripmine in BELL (BEREA; Thompson & Thieret 1986). The plant may have been a waif with other planted seed.

ALI EU.

2900--*Alopecurus pratensis* L.

Poaceae <Agrostideae>: *Alopecurus pratensis*

In North America, this widespread variable alien is most frequent in northeastern and northwestern regions; $2n = 28$ and 42 (FNA 24). It has been present in Ky. since 1890 or earlier (Gm), when distributed for pasture. But it remains generally uncommon to rare, and restricted to the Bluegrass region or

adjacent lowlands. It is locally dominant within a wet old field at Moberly Spring in FAYE.

ALI EU. **HAB** F-9 ::? D 5. **ABU** +4.

2901--Phleum pratense L.

Poaceae <Agrostideae>: *Phleum pratense*

This has been widely sown and naturalized in temperate regions of North America, except in drier regions and on much of the southeastern Coastal Plain. In Ky. it was probably present early after settlement, and has been a frequent favorite for making hay (Gm). *P. pratense* is a highly variable species; North American plants are ssp. *pratense*, which is usually hexaploid ($2n = 42$).

ALI EU. **HAB** F-10,8 D 5. **ABU** +6.

2902--Bromus pubescens Spreng.

Poaceae <Bromeae>: *Bromus* <Bromopsis> *pubescens* ("purgans"; ciliatus var. *purgans*)

This is widespread in eastern states, except on the southeastern Coastal Plain. Authorship of *pubescens* was recently corrected from Muhl. ex Willd. to Spreng. (Veldkamp 2009). Mapped records of this variable species may include transitions to other species, especially *latiglumis* and *nottowayanus*; $2n = 14$ in all native *Bromopsis* of eastern North America. However, hybrids among these species are not well documented (FNA 24).

Typical *pubescens* appears to have rather few (ca. 4-6) dull greyish-green leaves, blades glabrous to villous, sheaths glabrous to densely canescent (but usually without a distinct ring or tuft at summit), nodes partly exposed, second glumes usually 3-veined, lemma awns 2-8 mm, and anthers 2.5-5 mm long. Forms with glabrous sheaths (forma *laevivaginata* Wieg.) or glabrous lemmas (forma *glabriflorus* Wieg.) are widespread and probably do not deserve recognition; they have caused confusion with other taxa.

HAB 7,11,5 D 2. **ABU** g10 s10 -3.

2903--Bromus latiglumis (Shear) A.S. Hitchc.

Poaceae <Bromeae>: *Bromus* <Bromopsis> *latiglumis* (*altissimus*, *incanus*)

This northeastern species (sometimes named *B. altissimus* Pursh) occurs from New England to the northern Great Plains. It has been reported from Ky. by B and other authors (M), but the only verified colls. located for this Atlas are from rich weedy floodplain woods in LEWI (EKY) and PULA (KY). Also, Anderson (1924) reported that a coll. from FAYE then existed at KY: R.

Peter, 14 Sep 1834, Clay's Ferry. There are colls. from some adjacent counties in Ind. (D), Ohio (GH); see also F. The extensive mapping across Ky. by FNA 24 (and K) is erroneous, perhaps due to switching of data with *pubescens*.

Compared to *pubescens*, *latiglumis* differs in its anthers, with are usually shorter (ca. 1.5-3 mm versus 2.5-4 mm), and produced in Aug-Sep (versus Jun-Jul); its sheaths have a distinct villous ring at summit (usually absent or indistinct in *pubescens*) and clasping auricles (absent in *pubescens*); nodes are mostly covered (versus at least the upper exposed). Leaves tend to be darker green and more numerous (ca. 6-20 versus 4-6), with plants usually taller (up to 2 m versus 1.5 m).

Plants originally described as *B. purgans* L. var. *incanus* Shear are now considered just a more hairy form of *latiglumis* (perhaps including the colls. from FAYE and PULA).

HAB 1,4 D 3. **ABU** g9 s1? -4?

2904--Bromus nottowayanus Fern.

Poaceae <Bromeae>: *Bromus* <Bromopsis> *nottowayanus*

Although reported from scattered regions of east-central states, *nottowayanus* remains rather poorly understood and overlooked (McKenzie & Ladd 1995). Until recently there were only a few reliable records from Ky. (e.g. Naczi et al. 2002), but it may be fairly widespread. There has been some inconsistency in its treatment (F, Cr, W, FNA 24), and better description is needed. *B. nottowayanus* typically occurs on lower ground (especially fertile floodplain terraces), and flowers mostly in Jul, between *pubescens* and *latiglumis*.

B. nottowayanus reportedly differs from *pubescens* in its leaves which are moderately numerous (usually 6-8 versus 4-6), dark green, with "a conspicuous satiny sheen (when fresh)" on abaxial surfaces; adaxial surfaces are densely villous (versus glabrous to sparsely villous); sheaths are thinly to densely villous, usually with a distinct tuft of retrose hairs at the summit (versus glabrous to canescent, then lacking a distinct tuft at summit); nodes are mostly covered or nearly so (versus at least the upper exposed). In Ky. *nottowayanus* has thin hairs on culms and rachises (versus smooth in typical *pubescens*). Florets are similar, but second glumes are 3- or 5-veined (versus usually 3-veined); lemma awns are ca. 5-8 mm (versus 2-8 mm); anthers are reported to be relatively small.

HAB 4,7 D 2. **ABU** g8? s6? -2.

2905--*Bromus ciliatus* L. T

Poaceae <Bromeae>: *Bromus* <*Bromopsis*> *ciliatus* (*dudleyi*)

This is widespread in cool temperate to boreal regions of North America. It has been reported from Ky. by Pr, Gm and others (FNA 24), but no verified colls. have been documented for this Atlas. Colls. from MENI, ROWA (MDKY) and elsewhere have been tentatively assigned to *ciliatus* by some botanists, but need further study.

B. ciliatus differs from *pubescens* in its smaller anthers, ca. 0.9-1.7 mm (versus 2.5-5 mm). Also its lemmas are usually pubescent in two marginal bands with relatively long hairs (versus more uniformly pubescent), and the lateral nerves are distinct to base (versus obscure below middle). In southern Appalachian regions, *ciliatus* is known only from disjunct localities at high elevation.

B. kalmii Gray is a related northeastern species that has been reported from nearby in Ind., Ohio, W.Va. and Va. (FNA 24, D, W), but reports from Ky. have been erroneous (M). It has moderately small anthers (ca. 1-2.5 mm); lemmas are densely long-pilose, with awns only 2-3 mm long; first glumes are 3-nerved, second glumes 5-nerved.

2906--*Bromus ramosus* Huds. R

Poaceae <Bromeae>: *Bromus* <*Bromopsis*> *ramosus* (*asper*)

This is a widespread variable Eurasian species; $2n = 14, 28, 42$. There are few records from North America, and it does not seem to be increasing (FNA 24). *B. ramosus* was reported from Ky. by Britton (1901) and Anderson (1924), but no colls. have been located; Anderson cited F.T. McFarland #2194, June 19195, from Lexington [FAYE].

ALI EU.

2907--*Bromus erectus* Huds.

Poaceae <Bromeae>: *Bromus* <*Bromopsis*> *erectus*

This alien octoploid ($2n = 56$) is known from scattered sites in eastern and western states (FNA 24). There are few records from Ky., but it has become locally abundant on a dolomitic glade in GARR (JC for KY).

ALI EU. HAB F-12,10 E 5. ABU +4.

2908--*Bromus inermis* Leyss.

Poaceae <Bromeae>: *Bromus* <*Bromopsis*> *inermis*

This alien polyploid ($2n = 28$ to 70) is abundant in cool temperate regions across North America, but uncommon to absent in southeastern states. *B. inermis* was unknown in Ky. until after 1930 (Greenwell 1935, Gunn 1959, 1968b; M), when it became widely used for forage and soil stabilization. With persistent creeping rhizomes, it is especially abundant along irregularly cut brushy roadsides and some old fields, especially in the Bluegrass Region. *B. inermis* is less persistent in pastures with *Festuca arundinacea*.

ALI EU. HAB R-10,12 E 5. ABU +6*.

2909--*Bromus catharticus* Vahl R

Poaceae <Bromeae>: *Bromus* <*Ceratochloa*> *catharticus* (*unioloides*, *willdenowii*)

This South American hexaploid ($2n = 42$) has been widely cultivated for forage in warmer regions of North America, but there are only a few obscure unverified records from Ky. (Gm; RAB; Wharton & Barbour 1991; J). If present, this species is probably just planted or an occasional waif.

ALI SA.

2910--*Bromus arvensis* L.

Poaceae <Bromeae>: *Bromus* <*Bromus*> *arvensis*

This Eurasian diploid has been reported from Ky. by Anderson (1924), Mohlenbrock et al. (1966) and others, but the only verified colls. may be from KENT (KNK). Although widely scattered in North America (FNA 24), *arvensis* does not seem to be increasing in the Ohio Valley. It is relatively tall (often 80-110 cm), with large panicles (ca. 10-30 cm), and large anthers (2.5-5 mm versus 0.7-3 mm); lower leaf sheaths have distinctive soft appressed hairs. It is easily confused with *japonicus*, *racemosus* or other species, and all records deserve checking; see detailed key in FNA 24.

ALI EU. HAB H-10 :::: D 6. ABU +4.

2911--*Bromus squarrosus* L. R

Poaceae <Bromeae>: *Bromus* <*Bromus*> *squarrosus*

Although perhaps locally frequent in some northern states, this species does not seem to have become established in southeastern states. It was reported from FAYE by Gm in 1914, but no coll. has been located and there may have been confusion with *japonicus* (M). *B. squarrosus* has wider lemmas with conspicuous whitened margins, and panicles tend to be less spreading or drooping (Y, FNA 24).

ALI EU?

2912--*Bromus japonicus* Thunb. ex Murr.

Poaceae <Bromeae>: *Bromus* <*Bromus*> *japonicus*

This abundant weedy annual is widespread across temperate regions of North America. It was not reported from Ky. until 1919 (Anderson 1924), although Gm may have confused it with *squarrosus* a decade earlier. See further notes under *racemosus* and *secalinus*; for detailed keys see Y and FNA 24.

The largely East Asian *japonicus* and the Central Asian *squarrosus* are closely related diploids, with "at least some panicle branches as long or longer than the spikelets, sometimes sinuous; panicles nodding" (FNA 24). Also, awns on lemmas are relatively long (on average), arising ca. 1.5-2 mm below lemma apices (versus ca. 1-1.5 mm in most other species of eastern states), and usually divergent near bases.

ALI AS. HAB H-10 ::: D 6. **ABU** +6.

2913--*Bromus commutatus* L. T

Poaceae <Bromeae>: *Bromus* <*Bromus*> *commutatus*

This annual is widely reported from eastern and western states (FNA 24), but there has been much confusion with *racemosus*; see notes under the latter. In Ky. the first colls. referable to *commutatus* may date from ca. 1930-1940 (McFarland 1942; B).

ALI EU. HAB H-10 ::: D 6. **ABU** +6.

2914--*Bromus racemosus* L.

Poaceae <Bromeae>: *Bromus* <*Bromus*> *racemosus* {+ *commutatus*}

In its strict sense, *racemosus* has been mapped irregularly across temperate North America (FNA 24), but it is combined here with *commutatus*. The first reliable records from Ky. appear to date from the 1890s (Gm). Many records are probably referable to *commutatus*, which has more nodding, spreading panicles and larger spikelet parts but smaller anthers; see Y and FNA 24 for detailed keys. Some authors have suggested combining these species in North America (Hitchcock & Chase 1950, F), but they are generally treated as distinct in Europe.

B. commutatus often appears transitional from *racemosus* ($2n = 28$) to *japonicus* ($2n = 14$), and it may be the most variable of these three taxa ($2n = 14, 28, 56$). Colls. from BARR and LOGA (KY) are referable to *B. commutatus* var. *apricorum*, with distinctly pubescent lemmas. Some depauperate specimens mapped here are difficult to distinguish from *japonicus*.

ALI EU. HAB H-10 ::: D 6. **ABU** +6.

2915--*Bromus secalinus* L.

Poaceae <Bromeae>: *Bromus* <*Bromus*> *secalinus*

This old tetraploid annual, with largely glabrous sheaths and distinctive fruits (strongly inrolled lemmas exposing the rachilla and palea apex), is one of the original "cheat" grasses, especially in winter wheat. It is widely scattered in temperate regions of North America. In Ky. it is currently much less common than *racemosus/commutatus* and *japonicus*. But in 1914 Gm noted that *secalinus* was "common everywhere along farm roads and in wheat fields" and that *racemosus* was known from only one coll. (EDMO in 1898). A decade later, Anderson (1924) also called it "very common, especially in wheat fields" but indicated the spread of *racemosus-commutatus* (with 4 colls.) and the first coll. of *japonicus*.

ALI EU. HAB H-10,12 ::: E 6. **ABU** +4<.

2916--*Bromus hordeaceus* L.

Poaceae <Bromeae>: *Bromus* <*Bromus*> *hordeaceus* ("mollis")

This tetraploid annual of Mediterranean origin has distinctively short, dense panicles. Including four subspecies, *hordeaceus* is widespread across much of North America, especially western states, but it remains uncommon to absent in southeastern states (FNA 24). In Ky. most records are from roadsides and railroads, and made by John Thieret (KNK). These plants all appear to be typical ssp, *hordeaceus*.

ALI EU. HAB H-10 ::: D 6. **ABU** +4.

2917--*Bromus tectorum* L.

Poaceae <Bromeae>: *Bromus* <*Genea*> *tectorum*

This annual weed is widespread across temperate North America. It was unknown in Ky. until about 1900. In 1914 Gm noted: "sometimes observed along railroads and elsewhere." *B. tectorum* has now become locally abundant across the state; it remains closely associated with railroads and larger roadsides. Colls. from CAMP (KNK), HICK (MUR) and elsewhere are referable to var. *hirsutus* Regel, but that taxon is not recognized in recent treatments.

ALI EU. HAB R-10,12 ::: E 6. **ABU** +6.

2918--*Bromus sterilis* L.

Poaceae <Bromeae>: *Bromus* <*Genea*> *sterilis*

In North America, this annual weed occurs mostly in mid-temperate zones of eastern and western states (FNA 24, K). Otherwise, its ecology is similar to the closely related species, *tectorum*, which is much more common. *B. sterilis* was not recorded in Ky. until the 1930s (B). It has distinctively larger spikelet parts, and it tends to be more robust overall; $2n = 14$ and 28 (versus only 14 in *tectorum*).

B. diandrus Roth has even larger lemmas than *sterilis*, and may also be expected as a waif in southeastern states; $2n = 42$ and 56 (Y, FNA 24). It has not been verified in Ky., but a coll. of *sterilis* was misidentified by Gunn (1968b) as *B. rigidus* Roth, which has often been included within *diandrus* (M).

ALI EU. HAB R-10,12 ::: E 6. ABU +4.

2919--*Elymus macgregorii* R. Brooks & J.J.N. Campb.

Poaceae <Triticeae>: *Elymus macgregorii* (interior ined., *virginicus* var. minor)

This species of eutrophic woodlands was recently described, but R. Brooks and others have been aware of its distinctiveness for several decades (Campbell 2000). The correct name is in honor of the singular Clan MacGregor, not plural as in "*macgregorium*" (J). (E. "interior" was an early provisional unpublished name).

Variation deserves further study. Some colls. from CAMP, FAYE and elsewhere have distinctly pubescent spikes, sheaths or other plant parts, but these may not be common enough to deserve recognition as a variety. *E. macgregorii* can form occasional hybrids with *virginicus*, and more rarely with the later flowering *glabriflorus*, which it most resembles; $2n = 28$ in these and most other eastern *Elymus* species (FNA 24).

HAB 7,8,4 E 2. ABU g9 s9 -4.

2920--*Elymus glabriflorus* (Vasey) Scribn. & Ball var. *glabriflorus*

Poaceae <Triticeae>: *Elymus glabriflorus* var. *g.* (*virginicus* var. *g.*) [The specific epithet was misprinted as "*glabrifloris*" in J.] This species is largely restricted to southeastern states, but it extends up the Atlantic coast to Maine (A. Haines, pers. comm.). It usually occurs in native grassland or associated thin woodland. Var. *glabriflorus* tends to occur on relatively damp soils, especially lowlands in more southern regions.

Although *glabriflorus* is distinct, it has often been confused with other species. The name *glabriflorus* has often been applied to *macgregorii*, and this error has persisted in some cases (e.g. much of Ind. in FNA 24). Also, *glabriflorus* has often been misidentified as *canadensis* (e.g. in ML). In Ky. there appear to be occasional hybrids with *virginicus* and other species. Some colls. from MCLE and WEBS (EKY) may be hybrids with *villosus*.

HAB f-10,9,8 D 4. ABU g9 s8 -4.

2921--*Elymus glabriflorus* (Vasey) Scribn. & Ball var. *australis* (Scribn. & Ball) J.J.N. Campb.

Poaceae <Triticeae>: *Elymus glabriflorus** var. *australis* (*virginicus* var. *a.*) This relatively pubescent variety is often distinct, and tends to occur in more hilly regions, but the differences are not pronounced (FNA 24). There appear to be occasional hybrids with *hystrix*, *macgregorii* and perhaps other species.

HAB f-10,11,8 D 4. ABU g9 s9 -3.

2922--*Elymus virginicus* L. var. *jejunus* (Ramaley) Bush

Poaceae <Triticeae>: *Elymus virginicus** var. *jejunus* This species is widespread in temperate regions of central and eastern North America. Var. *jejunus* is usually distinct but often intergrades with var. *virginicus*. It is largely midwestern, where it generally occurs in thin woods and thickets along stream terraces. It is also widely scattered or adventive in northeastern states (FNA 24). Most Ky. records may be from adventive situations. The only Appalachian coll. is from a low meadow near a railroad in LAUR (KY), and it could represent a waif dispersed from afar.

HAB F-10.8,7 D 4. ABU g10 s4? -3?

2923--*Elymus virginicus* L. var. *virginicus*

Poaceae <Triticeae>: *Elymus virginicus* var. *v.* This is widespread and locally abundant in eastern North America, especially in submesic woods, thickets and fencerows. A few colls. (e.g. from EDMO, by MM for WKY) may be transitional to var. *jejunus*.

HAB f-8,7,10 D 3. ABU g10 s10 -3.

2924--*Elymus virginicus* L. var. *intermedius* (Vasey) Bush

Poaceae <Triticeae>: *Elymus virginicus** var. *intermedius* (*E. hirsutiglumis*) This occurs from the central and southern Great Plains to the northeastern United States and adjacent Canada, but is rare to absent in most southeastern states. It is generally distinct, flowering later than typical *virginicus*, and

concentrated on river banks or nearby sites in relatively open areas, especially near limestone (FNA 25).

HAB 1,4,10 D 4. **ABU** g9 s8 -2.

2925--*Elymus curvatus* Piper

Poaceae <Triticeae>: *Elymus curvatus* (virginicus var. submuticus)

This taxon is at least a good subspecies, with a more western range than others in the virginicus group. In Ky. it may occur only as occasional waifs. The name *E. curvatus* has priority over *E. submuticus* (Hook.) Smyth & Smyth, which was mistakenly used by Campbell (2002b) and others.

ALI w. **HAB** R-10,2 ::? D 5. **ABU** g9 s4? -2?

2926--*Elymus villosus* Muhl. ex Willd. var. villosus

Poaceae <Triticeae>: *Elymus villosus* var. v. (striatus)

This distinct species occurs mostly in the mid-temperate zone of eastern North America, usually in thin woods on relatively dry, base-rich soil (FNA 24).

Var. *villosus* is predominant, but see also var. *arkansanas*. Apparent hybrids with other species are relatively rare.

HAB 7,11,8 D 2. **ABU** g9 s9 -3.

2927--*Elymus villosus* Muhl. ex Willd. var. arkansanus (Scribn. & Ball) J.J.N. Campb.

Poaceae <Triticeae>: *Elymus villosus** var. *arkansanus*

This occasional variety may be generally distinct, but in Ky. there does not seem to be a clear difference in distribution. It tends to be more frequent in southern and western parts of the species' range.

HAB 11,8 D 2. **ABU** g8 s7 -3.

2928--*Elymus riparius* Wieg.

Poaceae <Triticeae>: *Elymus riparius*

This occurs mostly in mid- to cool-temperate regions of eastern North America, especially on sandy alluvial soils of Appalachian regions and southern New England. In Ky. there are occasional apparent hybrids with virginicus or other species. It has sometimes been misidentified as canadensis.

HAB 4,1,8 C 4. **ABU** g9 s9 -3.

2929--*Elymus canadensis* L.

Poaceae <Triticeae>: *Elymus canadensis*

This is widespread in central North America, with extensions to Pacific and Atlantic coastal states in the cool temperate zone (FNA 24). *E. canadensis* has

been often confused with *glabriflorus*, *riparius*, *virginicus* (especially var. *intermedius*) and others. The few known colls. are from banks of the Ohio Rv. or Mississippi Rv., or within a few miles of these rivers. All colls. except the one from HICK (JC) are were made before 1950. *E. canadensis* is sometimes planted with seed-mixes from more western prairies, and records from probable plantings are excluded here.

E. canadensis is highly variable but segregates are not well-defined. Most Ky. colls. are referable to the midwestern var. *robustus* (Scribn. & J.G. Sm.) Mackenzie & Bush, which may result from introgression with virginicus or *glabriflorus* (FNA 24). But the coll. from JEFF (DHL), along a railroad, resembles the more southwestern var. *brachystachys* (Scribn. & Ball) Farw. **HAB** r-1,10 D 4. **ABU** g8 s2 -5.

2930--*Elymus wiegandii* Fern.

Poaceae <Triticeae>: *Elymus wiegandii* (*canadensis* var. w.)

This northeastern species was recently found on Manchester Islands in the Ohio River (LEWI) by R. Geiss & R. Thompson (BEREA). The coll. differs from typical *wiegandii* in having awns with little or no curvature and the leaf surface glabrous (-scabrid). It may be hybridized with *riparius*.

HAB 4 D 3. **ABU** g7 s2 -3?

2931--*Elymus svensonii* Church

Poaceae <Triticeae>: *Elymus* <*Hystrix*> *svensonii* ("interruptus")

This poorly understood species occurs only in open woods on xeric limestone bluffs in c. Ky. and c. Tenn. In Ky. it forms distinct populations along the Palisades of the Kentucky Rv., especially in the downstream section near Frankfort (FRAN). But it also appears to hybridize extensively with *hystrix* in some localities, and occasionally with virginicus. The outlying coll. from ESTI (KY) appears hybridized with virginicus. The morphology and distribution of *svensonii* suggests origin from hybridization between *hystrix* and *canadensis*, perhaps during a cooler or drier period when the western species *canadensis* extended into the Interior Low Plateaus (Church 1967, Campbell 2002a).

The name *E. interruptus* Buckl. was formerly applied to plants that later became described as *svensonii*; see FNA 24 for notes on these and other taxa in the *hystrix* group. *E. churchii* J.J.N. Campb. is particularly close to *svensonii*; it occurs mostly in the Ozark-Ouachita region, but has been

recently discovered along the Tennessee Rv. in n. Ala. (A. Schotz & A. Datillo, pers. comm.).

HAB 12 \ E 3. **ABU** g5 s5 =.

2932--Elymus hystrix L. var. hystrix

Poaceae <Triticeae>: Elymus <Hystrix> hystrix var. h. (H. patula)

This is widespread in most eastern states and adjacent Canada, but largely absent from the southeastern Coastal Plain (FNA 24). It grows in varied habitats, but usually in moderately dry woods on moderately base-rich soils. In Ky. it appears to form relatively frequent hybrids with virginicus and several other species, sometimes resulting in locally extensive introgression.

HAB 11,7,8,5 D 2. **ABU** g10 s10 -2.

2933--Elymus hystrix L. var. bigelovianus (Fern.) Bowden

Poaceae <Triticeae>: Elymus <Hystrix> hystrix* var. bigelovianus

This occurs infrequently north of a line from S.D. through Ky. to N.J., often mixed with the typical variety; pure populations are known in the northeastern United States. In Ky. it is occasional and appears concentrated in some central and western localities, but it may not be worth recognizing.

HAB 11 D 2. **ABU** g8 s5? -2.

2934--Elymus elymoides (Raf.) Swezey W

Poaceae <Triticeae>: Elymus <Sitanion> elymoides (S. hystrix)

This widespread western species occurs only as a rare waif in eastern states. The only Ky. record is a coll. from a roadside in HARL (KY).

ALI W. **HAB** R-10 ::: D 6. **ABU** +4.

2935--Elymus trachycaulus (Link) Gould W

Poaceae <Triticeae>: Elymus <Gouardia> trachycaulus (Agropyron t.*)

This widespread northern and western species occurs mostly as waifs in eastern states. In Ky. the only known coll. is from near a parking lot in LETC (EKY); that plant is referable to ssp. subsecundus (Link) A. & D. Löve. Spp. trachycaulus, with shorter awns (ca. 1-13 mm versus 15-40 mm), is apparently native in glades of the Blue Ridge south to N.C. (W).

ALI W. **HAB** R-10 ::? D 6? **ABU** +4.

2936--Elymus repens (L.) Gould

Poaceae <Triticeae>: Elymus <Elytrigia> repens (Agropyron r.*)

This aggressive rhizomatous weed is widespread in cool temperate and southern boreal regions of North America. It was not recorded in Ky. until

about 1900. In 1914 Gm noted: "not as common in Kentucky as it is farther north and west. It has been noted at Lexington, and has been sent me once or twice from Western Kentucky." Also, Anderson (1924) stated it was "scarce." After 1930 it has gradually become widespread and locally abundant, especially in some old pastures where it may have been promoted.

The appropriate treatment for variation within repens remains uncertain (FNA 24). Most plants are hexaploid (2n = 42), with a complex origin. Segregates have not been generally recognized in North America, but F and others have suggested that plants along the north Atlantic coast, and perhaps adventive inland, may be treated as a native taxon: A. repens (L.) Beauv. var. subulatum (Schreb.) Roemer & J.A. Schultes (?= A. pungens noted in FNA 24). The coll. from MCRA (MUR) has been referred to var. subulatum forma setiferum Fern.

ALI EU. **HAB** F-10,8,6 E 5. **ABU** +6.

2937--Pascopyrum smithii Barkworth & D.R. Dewey

Poaceae <Triticeae>: Pascopyrum [Elymus] smithii (Elytrigia s.*; Agropyron s.)

This widespread western species occurs as waifs in eastern states, or perhaps locally adventive plants along railroads and similar sites. It is a rhizomatous octoploid (2n = 56), probably derived from hybridization of Elymus lanceolatus (Scribn. & J.G. Sm.) Gould with Leymus triticoides (Buckl.) Pilg., and its generic name has been uncertain (FNA 24).

ALI W. **HAB** R-10 ::? D 6? **ABU** +4.

2938--Agropyron cristatum (L.) Gaertn. ssp. pectinatum (Bieb.) Tzvelev R

Poaceae <Triticeae>: Agropyron cristatum* ssp. pectinatum

This Eurasian species has been widely planted for forage and reclamation in western North America. It has been reported from Ky. by Gm and others (M), but no coll. has been located.

ALI EU.

2939--Hordeum pusillum Nutt.

Poaceae <Triticeae>: Hordeum pusillum (nodosum)

This native annual is widespread in warm and mid-temperate regions of central and eastern North America. It was widely used for its edible seed during the Woodland era (Ford 1985). It may have been cultivated, but there is no clear evidence of selection. The earliest modern record from Ky. may

have been a coll. by R. Peter from Blue Lick [perhaps in ROBE], dated June 1835 (at KY before the fire; Anderson 1924).

ALI w. **HAB** R-10,8,9 ::: E 6. **ABU** g10 s9? +2?

2940--*Hordeum jubatum* L.

Poaceae <Triticeae>: *Hordeum jubatum*

This native annual is widespread in cool temperate and boreal regions of North America, and it sometimes adventive in southeastern states. It was first recorded from Ky. in the 1930s (B). Compared to *pusillum* (Y, FNA 24), *jubatum* is generally more robust, with distinctively arching to nodding inflorescences (versus erect) and much longer, outcurving awns (those of lemmas 10-70 mm versus 4-8 mm); 2n = 14, 28 and 42 (versus only 14).

ALI W. **HAB** R-10,9 ::: E 6. **ABU** +5.

2941--*Hordeum vulgare* L. C

Poaceae <Triticeae>: *Hordeum vulgare*

This annual grain crop (barley) is widely grown in North America, and plants sometimes establish from seed scattered away from fields, but it is not independently naturalized.

ALI EU.

2942--*Secale cereale* L. C

Poaceae <Triticeae>: *Secale cereale*

This annual grain crop (rye) is widely grown in North America, and plants sometimes establish from seed scattered away from fields, but it is not independently naturalized.

ALI EU.

2943--*Triticum spelta* L. C

Poaceae <Triticeae>: *Triticum spelta*

This annual grain crop (spelt) is widely grown in North America, and plants sometimes establish from seed scattered away from fields, but it is not independently naturalized. Waifs of *T. durum* Desf. (*durum* wheat) may also rarely occur, but that species is generally grown in drier regions further west.

ALI EU.

2944--*Triticum aestivum* L. C

Poaceae <Triticeae>: *Triticum aestivum*

This annual grain crop (wheat) is widely grown in North America, and plants sometimes establish from accidentally scattered seed, but it is not independently naturalized.

ALI EU.

2945--*Aegilops cylindrica* Host

Poaceae <Triticeae>: *Aegilops* [*Triticum*] *cylindrica*

This annual weed is native to the Mediterranean region and central Asia. It is widespread across the mid-temperate zone of North America, especially in winter-wheat (FNA 24).

ALI EU. **HAB** H-10 ::? D 6. **ABU** +4.

2946--*Danthonia compressa* Austin ex Peck

Poaceae <Danthonieae>: *Danthonia compressa*

This occurs mostly in Appalachian regions and New England, usually growing in moister habitats than *spicata* and *sericea*. These three species overlap in Appalachian regions, and 2n = 36 in all, but hybrids are unknown.

HAB r-8,10,7 :: B 4. **ABU** g8 s7 -2.

2947--*Danthonia spicata* (L.) Beauv. ex Roemer & J.A. Schultes

Poaceae <Danthonieae>: *Danthonia spicata*

This is widespread in humid temperate regions of North America, except the southeastern Coastal Plain. It typically grows in thin woods and openings on dry, medium-acid soils.

HAB f-11,12,10,8 C 3. **ABU** g10 s10 -2.

2948--*Danthonia sericea* Nutt.

Poaceae <Danthonieae>: *Danthonia sericea*

This occurs in southeastern states, mostly east of the Mississippi Rv., usually growing in open xeric sites on strongly acid sandy soils.

Some colls. from ROWA (MDKY) are unusually glabrate, perhaps suggesting *D. eplis* Scribn. (= *D. sericea* var. *eplis*). That taxon is rather poorly known and its status remains somewhat controversial (FNA 24, W). It is documented mostly in the Southern Appalachians or Piedmont, including the Cumberland Plateau in Tenn., usually growing in wetter sites than *sericea*.

HAB 12,10 + A 4. **ABU** g8 s7 -1.

2949--*Aristida oligantha* Michx.

Poaceae <Aristideae>: *Aristida oligantha*

This annual ranges widely from Atlantic to Pacific states (except those adjacent to Canada), but it is most common from southeastern states to the midwest.

HAB f-10,12 ::: C 6. **ABU** g10 s9 -3?

2950--*Aristida ramosissima* Engelm. ex Gray

Poaceae <Aristideae>: *Aristida ramosissima*

This annual occurs mostly in the central and lower Mississippi Valley, plus the adjacent Gulf Coastal Plain (FNA 24).

HAB f-12,10 +:: C 6. **ABU** g8 s5? -3.

2951--*Aristida dichotoma* Michx.

Poaceae <Aristideae>: *Aristida dichotoma* (var. d., ?*curtisii*)

This annual is widespread in most eastern states, except those adjacent to Canada. It is most common on disturbed rocky or eroded ground, in acid soils with low fertility. A coll. of C.W. Short dated Sep 1835 (at KY before fire) stated: "Throughout Barrens" (Anderson 1924). The coll. from MCRA (by R. Athey at EKY and MUR) is referable to var. *curtisii* Gray, which may be a transition to *A. basiramea*; see notes under that name.

HAB f-12,10 +:: B 6. **ABU** g9 s9 -2.

2952--*Aristida basiramea* Engelm. ex Vasey R

Poaceae <Aristideae>: *Aristida basiramea* (?*curtisii*)

This largely midwestern annual was mapped in Ky. by Hitchcock (1950), but verified colls. have not been located. *A. curtisii* (Gray ex S. Wats. & Coult.) Nash was also mapped in Ky. by Hitchcock and others (M), and may include a coll. from MCRA (see under *dichotoma*). *A. curtisii* has been treated as a variety of *basiramea* (Cr) or *dichotoma* (FNA 25). Its morphology and distribution appear somewhat intermediate between those two species. W considered it a distinct species, but largely adventive in southeastern states.

2953--*Aristida longispica* Poir.

Poaceae <Aristideae>: *Aristida longispica* (*gracilis*, *geniculata*, *intermedia*)

This is widespread in most eastern states, except those adjacent to Canada. Plants with longer awns have been named var. *geniculata* (Raf.) Fern., but probably do not deserve taxonomic recognition. There is little significant difference in range or habitat (FNA 25, W).

HAB f-12,10 +:: D 6. **ABU** g9 s8 -3?

2954--*Aristida purpurascens* Poir.

Poaceae <Aristideae>: *Aristida purpurascens* (var. p., *A. affinis*)

This perennial occurs mostly in southeastern states, plus sandy plains around Lake Michigan. In Ky. it is uncommon to absent on fertile calcareous soils, but it is locally abundant on dolomitic soils. The disjunct record from FAYE (EKY) probably came as a waif in hay transported to the Horse Park. See also notes under *virgata*.

HAB 10,12 C 5. **ABU** g9 s8 -4.

2955--*Aristida virgata* Trin. T

Poaceae <Aristideae>: *Aristida virgata* (*purpurascens* var. v.)

There has been confusion involving the names *purpurascens*, *affinis*, *virgata* and *palustris* (FNA 25). *A. affinis* (J.A. Schultes) Kunth is not considered distinct from typical *purpurascens* in recent treatments, but *virgata* may best be treated as a southern variety. *A. palustris* (Chapman) Vasey ("affinis" misapplied) is restricted to the Coastal Plain and unknown in Ky. or Tenn.

Colls. from LAUR (US) and PULA (KY, BERA) have been called *affinis*, *virgata* or *palustris*, but do not exactly match any of those taxa. They have awns that do not diverge as much as typical *purpurascens*, and might be transitional from *purpurascens* to *virgata*. C.W. Short's (CINC) coll. under "palustris" from "barrens of Ky." still needs to be checked (M).

2956--*Aristida tuberculosa* Nutt. R

Poaceae <Aristideae>: *Aristida tuberculosa*

This annual occurs on dunes and similar sandy sites along the southeast coast (La. to N.H.) and, greatly disjunct, in the upper midwest (mostly Wis. and Ill.). It was reported from Ky. by Hitchcock (1924), based only on a coll. of C.W. Short (GH) without locality. It was not included by Hitchcock & Chase (1950).

2957--*Chasmanthium sessiliflorum* (Poir.) Yates R

Poaceae <Centothecae>: *Chasmanthium* ("Uniola") *sessiliflorum* (*laxum* ssp./var. s.)

This southeastern species has been reported from Ky. but colls. have not been located (M; see LYON in FNA 25 & website). In c. Tenn., it is known from counties bordering Ky., and there is a disjunct record from e. Mo. It has been treated as a variety or subspecies of *laxum*; both are diploids (2n = 24), but there is no evidence of intergradation. It occurs in submesic to xeric woods, in contrast with the subhydric to xerohydric habitats of *laxum*.

C. sessilifolium differs from *laxum* (F, Cr, FNA 25, W) in its fertile lemmas, which are 7-9-veined (versus 3-7) and usually curved or irregularly contorted (versus straight); blades are wider on average (mostly 6-11 mm versus 3-7 mm), basally-concentrated (versus to half-way up the culm); sheaths are villous at least towards the summit (versus glabrous), mostly covering the nodes (versus nodes exerted); culms are up to 2-3.5 mm thick at nodes (versus ca. 1 mm).

2958--Chasmanthium laxum (L.) Yates

Poaceae <Centothecae>: *Chasmanthium* ("Uniola") *laxum* (ssp. l.)

This southeastern species is largely restricted to damp acid soils that dry out during the summer (i.e. hydroxeric), usually in thin woods or edges.

HAB 9,6 B 3. **ABU** g8 s7 -3.

2959--Chasmanthium latifolium (Michx.) Yates

Poaceae <Centothecae>: *Chasmanthium* ("Uniola") *latifolium*

This tetraploid (2n = 48) is widespread across southeastern states in various habitats, extending further west into the southern Great Plains than the other two species of this genus. Within Ky. it is especially common along the crests of riverbanks, between riparian woods and the open scoured zones. It is also locally abundant in thin woods on rocky slopes, especially on base-rich soils.

HAB 1,4,7,11 D 3. **ABU** g9 s9 -4.

2960--Arundo donax L.

Poaceae <Arundineae>: *Arundo donax*

This giant grass from the Mediterranean region is reportedly naturalized across southern states (FNA 25). In Ky. it may just be persistent from old ornamental plantings, but at least in some Appalachian river valleys, it appears remarkably aggressive locally along roads and woodland edges.

ALI EU. **HAB** f-10,8,6 C 5. **ABU** +5*.

2961--Phragmites australis (Cav.) Trin. ex Steud.

Poaceae <Arundineae>: *Phragmites australis* (ssp. au.; communis)

This species, in its broad sense, is widespread in temperate regions across the world. Ky. plants may all be the European ssp. *australis*. They are locally abundant in western regions of the state within disturbed wetlands and adjacent seasonally wet uplands, also frequent in patches along major highways.

The native ssp. *americanus* Saltonstall, P.M. Peterson & Soreng has been recently described, and is widely distributed across cool temperate North America in fens and marshes, but generally less common and less vigorous (Saltonstall et al. 2004; and supplementary website). D. Boone (pers. comm.) has recently found ssp. *americanus* in e. Ind. (Randolph Co.), and it is reported from w. Ohio (Cedar Bog).

The best diagnostic character for ssp. *americanus* is its longer ligules (1-1.7 mm versus 0.4-0.9 mm). Other differences from ssp. *australis* are its usually longer lower glumes (3-6.5 mm versus 2.5-5 mm) and upper glumes (5.5-11 mm versus 4.5-7.5 mm); more open inflorescence; leaves yellow-green (versus usually blue-green), the sheaths loose and usually dropped (versus tight, usually persistent); culms smooth (versus longitudinally ridged), green to maroon, at least at nodes (versus usually all green), and with black fungal spots often present at nodes and below (versus rarely present); plants often mixed with other species (versus usually in monocultures).

ALI EU. **HAB** f-2,3,9 D 5. **ABU** +6*.

2962--Muhlenbergia capillaris (Lam.) Trin.

Poaceae <Cynodonteae>: *Muhlenbergia* <Podosemum+> *capillaris* (var. c.)

This southeastern species is widely scattered but rare in Ky., and seems restricted to better remnants of native grassland on relatively dry, infertile soils (sometimes perched on cherty substrates above limestone outcrops). Before B rediscovered it in the 1930s, *capillaris* was known only from colls. of C.W. Short: (1) in 1835 from the "barrens" (at KY before lost in the 1948 fire; see Anderson 1924); (2) in 1840 from "Louisville" (KY). See also notes under *expansa*.

HAB 12,10 +? C 4. **ABU** g9 s6 -2.

2963--Muhlenbergia expansa (Poir.) Trin. R

Poaceae <Cynodonteae>: *Muhlenbergia* <Podosemum+> *expansa* (*capillaris* var. *trichopodes*)

There is a coll. of C.W. Short (PH) from "summit of acid knob in barrens near Mammoth Cave" ca. 1840 that was initially labeled *Agrostis trichopodes* Ell., then annotated *M. capillaris*. FNA 25 seems to have mapped this coll. as *M. expansa* in EDMO, but the record remains dubious. *M. expansa* is virtually unknown outside of the Coastal Plain from se. Tex. to e. N.C. Moreover, *capillaris* does occasionally lack well-developed awns on lemmas, then resembling *expansa*, and these species can easily be confused, especially in

immature specimens. [But see also *Gymnopogon brevifolius* (versus *G. ambiguus*), for a confirmed disjunction of similar nature.]

2964--*Muhlenbergia torreyana* (J.A. Schultes) A.S. Hitchc. R

Poaceae <Cynodonteae>: *Muhlenbergia* <Podosemum+> *torreyana*
This was reported from Ky. by Hitchcock (1950) but no coll. has been found. It is a globally endangered species known only from scattered localities on the central Atlantic coastal plain in N.Y. to N.Car., plus single records from Ga., Tenn. and perhaps Ky. It should be looked for in damp grassy woodland remnants on the Cumberland Plateau or nearby.

2965--*Muhlenbergia asperifolia* (Nees & Meyen ex Trin.) Parodi W

Poaceae <Cynodonteae>: *Muhlenbergia* <Podosemum+> *asperifolia*
This western species was been collected in the 1990s from BOON (MICH, KNK) in the median of Interstate-75 (A.A. Reznicek, pers. comm.). It has now disappeared due to construction (D. Boone, pers. comm.).

2966--*Muhlenbergia cuspidata* (Torr. ex Hook.) Rydb.

Poaceae <Cynodonteae>: *Muhlenbergia* <Podosemum+> *cuspidata*
This upper midwestern species has disjunct eastern populations on limestone clifftops in s. Ohio, c. Ky., c. Tenn., and w. Va. (FNA 25). The record from Panther Rock in ANDE (Bryant 1973) needs to be verified. At Grassy Knob in ESTI, *capillaris* occurs on ledges above *cuspidata*. These two species, and other cespitose "muhly-grasses" in Ky. (mostly with $2n = 20$ or unknown), are quite distinct in morphology and habitat from the regular rhizomatous species of this genus (mostly with $2n = 40$).

HAB 12 +\ E 5. **ABU** g10 s4 =.

2967--*Muhlenbergia sylvatica* Torr. ex Gray

Poaceae <Cynodonteae>: *Muhlenbergia* *sylvatica*
This is widespread in most of eastern North America, except the southeastern Coastal Plain. However, it is largely restricted to mesic and riparian woods on medium-acid soils. See notes under *tenuiflora*, which is sometimes confused. Both species are minutely hairy below nodes, as in *glabriflora* and *mexicana*. Hybrids may be expected; reportedly, $2n = 40$ for all of the rhizomatous "muhly-grasses" in eastern forests (FNA 25).

HAB 5,4,7 C 2. **ABU** g9 s9 -3.

2968--*Muhlenbergia mexicana* (L.) Trin. R

Poaceae <Cynodonteae>: *Muhlenbergia* *mexicana*

This widespread western and northern species probably occurs in Ky., but documentation is inadequate, and there has been confusion in nomenclature with *frondosa*. *M. mexicana* is reported from close to northern and eastern borders of the state (FNA 25, K, W). There is a coll. of C.W. Short (KY) with two labels; (1) "alluvium of the Ohio", Ky. 1840; (2) "rocky woods... map" (initially determined as *Agrostis lateriflorus*). Also, plants that may be this species have been recently found along wooded streamheads in LAUR (JC for KY), but flowering has not yet been observed.

ABU g10 s2?

2969--*Muhlenbergia frondosa* (Poir.) Fern.

Poaceae <Cynodonteae>: *Muhlenbergia* *frondosa* ("mexicana")
This is widespread in riparian woods of northeastern states. There has been confusion with *mexicana*, which name was misapplied to *frondosa* in much literature before F. See also notes under *bushii* and *glabriflora*.

HAB 4,1,6 E 3. **ABU** g9 s9 -3.

2970--*Muhlenbergia commutata* (Scribn.) Bush

Poaceae <Cynodonteae>: *Muhlenbergia* *commutata* (*frondosa* f. *commutata*)
This taxon has generally been treated as no more than a form of *frondosa*, but it deserves further attention. In Ky. it is known only from the Mississippian Embayment, and in Mo. it is widely scattered (St). It appears somewhat intermediate between *frondosa* and *bushii*, suggesting potential origin from hybrids.

HAB 4,6 D? 2. **ABU** g7? s5? -4.

2971--*Muhlenbergia bushii* Pohl

Poaceae <Cynodonteae>: *Muhlenbergia* *bushii* (*brachyphylla*)
This is poorly known in much of its range, and has been confused with *frondosa* or *sylvatica*. Records are concentrated in the midwest around Mo., scattered over s. Ill. and s. Ind., and disjunct in Atlantic states from Md. to Ga. (FNA 25; W). Plants mostly have short awns or none, but long-awned plants may predominate in Ky. (and perhaps south to Miss.), where there has been some confusion or intergradation with the awned variant of *frondosa* treated here under the name *commutata*. The only colls. that clearly match typical *bushii* may be from BALL (MUR) and LYON (APSU).

HAB 6,7,9,10? D 2. **ABU** g7 s2? -5.

2972--*Muhlenbergia glabriflora* Scribn.

Poaceae <Cynodonteae>: *Muhlenbergia* *glabriflora*

This uncommon species is centered in the central Mississippi Valley, typically in thin woods on clayey soils with seasonal dryness and wetness. There are disjunct sites in e. Tenn., se. Ohio (Gardner et al. 2004), Va. and N.Car. (K, W). It can be confused with frondosa, and some records should be rechecked.

M. glabriflora usually has glabrous lemmas; in contrast, other eastern species have hairy lemmas, at least near the base. Also, it has leaves that are relatively narrow (ca. 2-4 mm versus up to 7-8 mm or more in other species), firm and erect. Plants are rather bushy-branched, with axillary inflorescences that are partly included in sheaths, as in *frondosa* and *bushii*. Stem internodes are mostly glabrous and shiny, as in *frondosa* and *bushii*, though more scabrid to puberulent below nodes.

FNA 25 indicated that the specific epithet should be "*glabrifloris*", but that spelling may be considered an orthographic variant; "*glabriflora*" is used by F, Cr, J, W and others.

HAB 10,12,9? D 3. **ABU** g7 s5 -4.

2973--*Muhlenbergia tenuiflora* (Willd.) B.S.P.

Poaceae <Cynodonteae>: *Muhlenbergia tenuiflora*

This ranges across east-central states, with a concentration in Appalachian regions (FNA 25, K); closely related plants in East Asia are now considered to be a distinct species (*curvistarata*). *M. tenuiflora* is most similar to *sobolifera*, and there may be intermediates (e.g. the coll. from HEND at EKY). In general, *tenuifolia* is restricted to acid sandy soils; *sobolifera* is most abundant on calcareous soils but also occurs on moderately base-rich inclusions within non-calcareous landscapes.

Distinction of *tenuiflora* from some other species can be difficult. Some possible transitions to *sobolifera* within southern Appalachian regions have been named var. *variabilis* (Scribn.) R.W. Pohl; these have sheaths and stems virtually glabrous, and lemmas with awns only 0-4 mm long (Cr, J). Distinction of *tenuiflora* from *sylvatica* can also be difficult; the detailed keys of K and W are useful. Colls. from GARR and JESS match *tenuiflora* in their relatively short abruptly tapering glumes, but *sylvatica* in other characters. Note also that *M. tenuiflora* has sometimes been confused in name with *M. tenuifolia* (Kunth) Trin., which is a western species; see switched maps in FNA 25 (1st printing).

HAB 11,5 +? B 2. **ABU** g9 s9 -2.

2974--*Muhlenbergia sobolifera* (Muhl. ex Willd.) Trin.

Poaceae <Cynodonteae>: *Muhlenbergia sobolifera*

This species of dry calcareous woods in east-central states is especially common in the Ozark region. In Ky. it is sometimes confused with *tenuiflora*; see notes under that name.

HAB 11,12,5 + D 2. **ABU** g9 s9 -2.

2975--*Muhlenbergia schreberi* J.F. Gmel.

Poaceae <Cynodonteae>: *Muhlenbergia schreberi*

This widespread eastern species is most common on moist base-rich soils in partial shade, generally with regular disturbance such as along trails. During the early decades of settlement, *M. schreberi* was known as "nimble will" and prospered locally in woodland pastures and lawns.

Meade (1796) provided some remarkable early notes from the central Bluegrass: "The only wild grass in the settled parts is what is here call'd the nimble-will more resembling the wire grass [perhaps *Poa compressa*] than any other in Virginia. It is rather finer... In the very earliest settlements as about Danville, the nimble-will, a very good pasture grass, has taken place of the weedy growth which first succeeded the primitive cane brake. This will be the case in four or five years every where on this side [of] the Kentucky River." However, Rafinesque (1822) seems to have named this *Panicum cynodon*, implying *C. dactylon*, which is still a common error among students.

The local midwestern plant known as *M. X. curtisetosa* (Scribn.) Bush is also expected in Ky., since it is known from s. Ill. and s. Ohio (FNA 25). It may be derived from hybrids of *schreberi* and *frondosa*, and may well be overlooked in much of the Mississippi Valley.

HAB f-8,7,10,4 E 3. **ABU** g10 s10 +1?

2976--*Muhlenbergia racemosa* (Michx.) B.S.P. R

Poaceae <Cynodonteae>: *Muhlenbergia racemosa*

This is a widespread species to the north and west of Ky., and is occasionally adventive in northeastern states. It was mapped in Ky. by Hitchcock (1935) but not Hitchcock & Chase (1950) or FNA 25. A vegetative coll. from a cliff near a railroad in LEE (JC for KY) is tentatively identified as *racemosa*.

2977--*Sporobolus indicus* (L.) R. Br.

Poaceae <Cynodonteae>: *Sporobolus indicus* (*poiretii*)

This is a widespread variable species of pantropical to warm temperate regions; $2n = 18, 24, 36$ (FNA 25). It was first recorded in Ky. during the 1930s (B). It has become widely scattered, especially along roadsides on sandy soils.

ALI AS. HAB f-10,12 ::? B? 6? **ABU** +4.

2978--*Sporobolus compositus* (Poir.) Merr.

Poaceae <Cynodonteae>: *Sporobolus compositus* (*compositus* var. *co.*, *asper* var. *a.*)

This widespread variable species occurs on dry base-rich soils in most temperate regions of North America, but concentrated in the Great Plains. In its broad sense, $2n = 54, 88$ and 108 ; segregates still need cytological comparison.

HAB f-10,12,8 D 5. **ABU** g9 s9 -2?

2979--*Sporobolus drummondii* (Trin.) Vasey W

Poaceae <Cynodonteae>: *Sporobolus drummondii* (*compositus* var. *d.*, *asper* var. *hookeri*)

This is a relatively slender southwestern segregate of *compositus* that is treated as a variety by some authors (FNA 25). A coll. from a roadside in BOON (KNK) is referable to *drummondii* or perhaps the more rhizomatous *S. macer* (Trin.) A.S. Hitchc. (= *S. compositus* var. *m.*). There are no other records from Ky. for either taxon.

2980--*Sporobolus clandestinus* (Biehler) A.S. Hitchc.

Poaceae <Cynodonteae>: *Sporobolus clandestinus* (*compositus/asper* var. *cl.*)

This is widespread in southeastern states, and extends north locally to the southern Great Lakes region. *S. clandestinus* can be confused with *compositus* and *drummondii*, but it is generally considered a distinct species (FNA 25). *S. clandestinus* tends to occur on drier sites in rocky glades, and is infrequent to absent in old fields or regular roadsides on deeper soils.

Compared to *compositus* and *drummondii*, the fruits of *clandestinus* are usually larger (1.5-3.5 mm versus 1-2 mm); pericarps are dry and tight (versus gelatinous and loose when wet); lemmas are usually glabrous and hyaline (versus scabrid to puberulent and opaque). Also, its inflorescences tend to be smaller (4-11 cm x 0.4-3 mm versus 5-30 cm x 4-16 mm) and usually become largely exserted from the sheath (versus remaining largely included).

HAB 12,10,8 + D 5. **ABU** g8 s6 -3?

2981--*Sporobolus neglectus* Nash

Poaceae <Cynodonteae>: *Sporobolus neglectus* (*vaginiflorus* var. *n.*)

This annual is similar to *vaginiflorus* and often confused. Both species are widespread on rocky base-rich sites across east-central North America and differences in ecology are not obvious. *S. neglectus* may be more frequent on disturbed sites such as exposed riverbanks and roadsides, but typical *vaginiflorus* can also be locally abundant along roads.

Compared to *vaginiflorus*, *neglectus* has smaller spikelets with glabrous (versus strigose) lemmas and free-falling (versus enclosed) grains; $2n = 36$ versus 54 . A few Ky. colls. suggest transitions to *vaginiflorus*, especially if lemmas have marginal hairs (e.g. from ROWA at KNK).

HAB R-12,10,1 +:: D 6. **ABU** g9 s8? -1?

2982--*Sporobolus vaginiflorus* (Torr. ex Gray) Wood

Poaceae <Cynodonteae>: *Sporobolus vaginiflorus* (var. *v.*)

This annual is widespread on xeric base-rich soils in eastern North America, but less common to the southeast (FNA 25, K). It is close to *neglectus*; see notes under that name. Some colls. from Ky. are hard to assign, especially if lemmas are only 2-3 mm long (e.g. from FAYE and SIMP at KY).

Some other colls. (e.g. from BULL at KY and MEAD at US) have pilose leaves, and may approach the more western var. *ozarkanus* (Fern.) Shinners. However, their spikelets do not indicate *ozarkanus*, which has glumes longer than lemmas (versus shorter); 3-nerved lemmas (versus 1-3 nerved); and obtuse paleas (versus acute to acuminate). No records of *ozarkanus* from Ky. are accepted here, although it has been reported by Cr. R. McGregor (in annotations) and others. The occurrence of *ozarkanus* east of the Mississippi Rv. remains somewhat uncertain (FNA 25, PL, W).

HAB r-12,10 == D 6. **ABU** g10 s9 -1?

2983--*Sporobolus cryptandrus* (Torr.) Gray

Poaceae <Cynodonteae>: *Sporobolus cryptandrus*

This is a widespread variable species of central North America, but extending locally to both Pacific and Atlantic coasts; $2n = 36/38$ and 72 (FNA 25). It usually occurs on dry sandy soils. In Ky. it appears native and locally abundant on high sandy banks of the Mississippi Rv. and lower Ohio Rv. The coll. from CAMP (KNK) is presumably from an adventive plant, found by Budell & Thieret in a railroad yard at Silver Grove.

The related southeastern species, *S. junceus* (P. Beauv.) Kunth, is known from banks of the Obed Rv. in e. Tenn., and may be expected along the Big South Fk. of Cumberland Rv.

HAB r-1,10 :: C 5. **ABU** g10 s5 -1?

2984--*Sporobolus heterolepis* (Gray) Gray

Poaceae <Cynodonteae>: *Sporobolus heterolepis*

This tetraploid ($2n = 72$) occurs mostly in prairie remnants of the upper midwest, with only a few disjunct localities in eastern states (FNA 25, K). In Ky. it is known only from three localities: in BULL (Cedar Creek Glades, at KY); CRIT (Crittenden Springs Glade, at EKY); and LIVI (Rosenfield Glade, pers. comm. of M. Evans).

HAB 12,10 E 5. **ABU** g9 s3 -4?

2985--*Calamovilfa arcuata* K.E. Rogers

Poaceae <Cynodonteae>: *Calamovilfa* [*Sporobolus*] *arcuata*

This occurs mostly along rocky riverbanks in the Ozarks and Ouachitas. It was recently discovered along the Big South Fork in MCRE (EKY) by N. Drozda and others of KSNPC. In Tenn. it is known from several other sites further up this river and along the Obed Rv. These Appalachian localities are highly disjunct from the main range of this species. There is evidence that *Calamovilfa* could be reasonably included within *Sporobolus* (W).

HAB 1 A 5. **ABU** g6? s2 =.

2986--*Eragrostis hypnoides* (Lam.) B.S.P.

Poaceae <Cynodonteae>: *Eragrostis* <*Neeragrostis*> *hypnoides*

This stoloniferous annual is a diploid ($2n = 20$) that is widespread over much of North and South America. However, it is generally restricted to shores of rivers, lakes or nearby disturbed sites.

HAB 1,2 ~ D 6. **ABU** g10 s8 -2.

2987--*Eragrostis reptans* (Michx.) Nees

Poaceae <Cynodonteae>: *Eragrostis* <*Neeragrostis*> *reptans*

This is a hexaploid ($2n = 60$) dioecious relative of *hypnoides*. It occurs in similar shoreline habitats, but its range is much smaller, from the Mississippi Rv. watershed to northern Mexico. In Ky. it is known only from banks of the Ohio and Mississippi Rivers.

Compared to *hypnoides*, *reptans* has 3 (versus 2) distinctly larger anthers. It has more congested inflorescences (the pistillate subglobose), on largely

naked peduncles (versus leafy branches); lemmas tend to be longer (usually 2-4 mm versus 1.5-2 mm); and plants are generally more hairy (F, FNA 25).

Some authors have transferred reptans to *Neeragrostis*, either as a monotypic genus or with *hypnoides* as well; see citations of W and M. Barkworth (online update of FNA 25).

HAB 1 ~ D 6. **ABU** g10 s4 -2?

2988--*Eragrostis cilianensis* (All.) Vign. ex Janchen

Poaceae <Cynodonteae>: *Eragrostis cilianensis* (*megastachya*; *poaeoides* var. m.)

This widespread weedy annual has probably been present in Ky. since early after settlement. It was first reported by McMurtrie (1819), under the synonym *Briza eragrostis* L. In 1914 Gm noted: "likely to be found in any cultivated field, along paths, etc."

ALI EU. **HAB** F-10,8 ::? D 5. **ABU** +5.

2989--*Eragrostis minor* Host

Poaceae <Cynodonteae>: *Eragrostis minor* (*poaeoides*)

This alien is widespread across temperate regions of North America, like the closely related *cilianensis*, but it is less common in general (FNA 25, K). Immature colls. of *minor* can be difficult to distinguish.

Compared to *cilianensis*, *minor* generally has smaller spikelet dimensions, with lemmas 1.4-1.8 mm long (versus 2-2.8 mm) that usually lack glands on keels (versus bearing 1-3 glands). Florets have 2 reddish-brown anthers (versus 3 yellow ones); and they disarticulate below lemmas (versus below paleas). Vincent (2004b) noted that occasional "phyllody" occurs in spikelets of *minor*, forming vegetative shoots instead of fertile flowers. Reportedly, $2n = 40$ or 80 (versus 20 or 40); see Cr and FNA 25.

ALI EU. **HAB** F-10,8 ::? D 6. **ABU** +5.

2990--*Eragrostis pilosa* (L.) Beauv.

Poaceae <Cynodonteae>: *Eragrostis pilosa*

This is a weedy annual of warmer regions that may originate from Eurasia, at least in the case of var. *pilosa*, which predominates in North America (FNA 25). *E. pilosa* was first recorded in Ky. during the 1920s (Anderson 1924; B). It has often been confused with *pectinacea* in southeastern states (e.g. compare state maps in K). Some colls. from Ky. still need rechecking.

Compared to pectinacea (FNA 25), pilosa has panicle branches usually whorled at lower two nodes (versus single or paired), narrower spikelets (0.6-1.4 mm versus 1.2-2.5 mm), shorter lower glumes (0.3-0.8 mm versus 0.5-1.5 mm), and lemmas with less conspicuous nerves; 2n = 40 (versus 60).

ALI S? **HAB** F-10 ::: C 6. **ABU** +5.

2991--*Eragrostis pectinacea* (Michx.) Nees ex Steud.

Poaceae <Cynodonteae>: *Eragrostis pectinacea* (purshii)

This annual is a widespread variable hexaploid (2n = 60) that ranges across temperate regions of North America. Before European settlement, it may have been largely restricted to the banks of larger streams and rivers; see M for early records from Ky. It is now also abundant in narrow strips along paved roads and on similarly disturbed ground.

HAB R-10,1 ::: D 6. **ABU** g10 s10 +3?

2992--*Eragrostis frankii* C.A. Mey. ex Steud.

Poaceae <Cynodonteae>: *Eragrostis frankii*

This annual is weedy and variable (2n = 40, 80), but largely restricted to east-central states (FNA 25, K). Like pectinacea, it may have been concentrated on banks of larger streams and rivers before becoming much more widespread after settlement. It has been confused with capillaris; see notes under that name.

HAB r-1,10 ::: D 6. **ABU** g9 s9 +1?

2993--*Eragrostis capillaris* (L.) Nees

Poaceae <Cynodonteae>: *Eragrostis capillaris*

This annual polyploid (2n = 50, 100) is closely related to frankii. Both have ranges centered in east-central states, but capillaris is slightly more southern and typically occurs on drier, poorer soils, often with much sand or gravel.

Compared to frankii, capillaris can be distinguished based on its deeply grooved seeds. Also, its panicles are larger (ca. 10-50 cm long versus 4-20 cm), forming most of the plant's height (versus less than half), with longer pedicels (4-25 mm versus 1.5-5 mm). Plants are pilose along sheath margins (versus mostly glabrous), but stems lack glandular pits as found below nodes in frankii.

HAB F-10 ::? C 6. **ABU** g9 s9 -1?

2994--*Eragrostis hirsuta* (Michx.) Nees

Poaceae <Cynodonteae>: *Eragrostis hirsuta*

This is a widespread southeastern perennial polyploid (2n = 100). In Ky. most records of come from sandy banks of larger rivers or nearby disturbed areas. However, it has also been found in rocky parts of an eroded cherty old field (METC at WKY). Colls. from HICK (MUR) and LIVI (R. Athey) may be referable to var. laevivaginata Fern., but that relatively eastern variety is not recognized in recent treatments.

The related western species, *E. trichodes* (Nutt.) Wood, is expected in w. Ky., since it occurs in s. Ill. and in w. Tenn. (FNA 25, K).

HAB f-10,12 C 5. **ABU** g8 s7 -2?

2995--*Eragrostis spectabilis* (Pursh) Steud.

Poaceae <Cynodonteae>: *Eragrostis spectabilis*

This widespread, variable weedy perennial extends from eastern states to Belize; 2n = 20, 40, 42 (FNA 25). Colls. from BARR and LIVI (MUR) may be referable to var. sparsihirsuta Farw., but that variety is not recognized in recent treatments.

HAB F-10 C 5. **ABU** g9 s9 +1?

2996--*Eragrostis curvula* (Schrad.) Nees

Poaceae <Cynodonteae>: *Eragrostis curvula*

This South African species is widespread across southern states (K). It is a caespitose polyploid (2n = 40, 50) that has persisted at many sites after been extensively sown for soil stabilization on roadsides and other disturbed sites. In Ky. it has become much more frequent than colls. indicate, but most or all colls. may be from plantings rather than truly naturalized situations. It is locally abundant along several major highways built after 1970, especially in south-central regions of the state.

ALI AF. **HAB** F-10 C 5. **ABU** +5.

2997--*Tridens flavus* (L.) A.S. Hitchc.

Poaceae <Cynodonteae>: *Tridens* (*Triodia*) *flavus* (var. f.)

This is widespread in eastern states, except those adjacent to Canada (FNA 25, K). It prospers in hay meadows of Ky. and other areas cut once during May to July. In 1914 Gm noted: "often seen in lawns and along railroads. It has little value at any stage for forage, and should be got rid of by keeping it from seeding, and grubbing it out in late summer." *T. flavus* may now have increased in farmland managed with machines rather than people.

HAB F-10,7,12 D 5. **ABU** g10 s10 +3.

2998--*Tridens strictus* (Nutt.) Nash

Poaceae <Cynodonteae>: *Tridens* (*Triodia*) *strictus*

This southeastern species occurs mostly on base-rich soils of the lower Mississippi Valley (FNA 25, K).

HAB f-10,9 D 5. **ABU** g8 s6 -3.

2999--*Triplasis purpurea* (Walt.) Chapman

Poaceae <Cynodonteae>: *Triplasis purpurea* (var. p.)

This ranges widely across central and eastern states, but it is concentrated on dry sandy soils of the Great Plains, midwest and coastal regions. In Ky. it is known only from sandy banks of the Ohio Rv. in BALL (EKY, WKY), and the Mississippi Rv. in FULT (JC for KY). *Triplasis* (2n = 40) is a small genus closely allied with *Tridens* (2n = 40 in most species).

HAB 1 ::: C 6. **ABU** g9 s3 -1?

3000--*Leptochloa fascicularis* (Lam.) Gray

Poaceae <Cynodonteae>: *Leptochloa* <*Diplachne*> *fascicularis* (*fusca* ssp. fa.*)

The closely related species (or subspecies), *L. uninervia* (J. Presl.) N. Snow, is also expected. Both taxa are widespread weeds on damp base-rich soils in warmer regions of the Americas. They extend north through much of the U.S.A, especially in drier central states. All taxa of *Leptochloa* in Ky. are probably diploids (2n = 20; FNA 25).

ALI s. **HAB** H-9,10 ::? D 6. **ABU** g10 s7? -2?

3001--*Leptochloa panicoides* (J. Presl) A.S. Hitchc.

Poaceae <Cynodonteae>: *Leptochloa* <*Diplachne*> *panicoides* (*halei*)

In the U.S.A., this largely South American weed occurs mostly on damp base-rich soils near larger rivers in the central and lower Mississippi Valley, plus elsewhere on the Gulf Coastal Plain. Most or all North American plants are considered adventive by some authors (W).

ALI SA. **HAB** h-2,9 ::? D 6. **ABU** +4.

3002--*Leptochloa brachiata* Steudl.

Poaceae <Cynodonteae>: *Leptochloa brachiata* (*filiformis*, *panicea* ssp. b.*)

This widespread weed occurs in cropland and similar habitats from South America to southern states, where it is considered partly adventive. The closely related *L. mucronata* Michx. has a more southwestern range within North America. Both taxa been combined as subspecies of the cosmopolitan weed, *L. panicea* (Retz.) Ohwi, in some treatments (FNA 25). There may be

colls. of *mucronata* from BALL (R. Athey; check EKY) and WARR (Pr; check MO), but those identifications have not been confirmed.

ALI s. **HAB** H-10,9,6,1 ::? D 6. **ABU** g10 s8? -2?

3003--*Leptochloa mucronata* (Michx.) Kunth T

Poaceae <Cynodonteae>: *Leptochloa mucronata* (*attenuata*, *panicea* ssp. m.)

See notes under *brachiata*.

ALI s.

3004--*Zoysia japonica* Steud. C

Poaceae <Cynodonteae>: *Zoysia japonica*

This subtropical grass has been widely used in lawns, but it is not clearly naturalized in the U.S.A., except perhaps in the warmest regions (FNA 25, K, W). It has been mapped in Ky. by K.

ALI AS.

3005--*Bouteloua curtipendula* (Michx.) Torr.

Poaceae <Cynodonteae>: *Bouteloua curtipendula*

This is widespread but concentrated in arid southwestern regions and the Great Plains. It is disjunct in scattered regions of more eastern states, where it occurs locally in xeric calcareous glades and glasslands (FNA 25). Variation deserves further research; reportedly, 2n = 20 to 103 (FNA 25).

HAB 12 + E 5. **ABU** g10 s5 -5.

3006--*Chloris verticillata* Nutt.

Poaceae <Cynodonteae>: *Chloris verticillata*

This common variable weed of the southern Great Plains is only adventive in eastern states.

ALI W. **HAB** F-10 ::? D 6? **ABU** +4.

3007--*Chloris virgata* Sw. W

Poaceae <Cynodonteae>: *Chloris virgata*

This largely tropical weed is adventive in warmer regions of the U.S.A. The only Ky. record is based on a reported coll. from MCRA in the catlog of R. Athey (check MEM).

ALI S. **HAB** F-10 ::? D 6? **ABU** +4.

3008--*Dactyloctenium aegyptium* (L.) Willd. R

Poaceae <Cynodonteae>: *Dactyloctenium aegyptium*

This widespread variable weed of the Old World tropics is common on the Coastal Plain in southeastern states, and occasionally adventive further north (FNA 25, SE). It was reported from Ky. by RAB, but no coll. has been found.
ALI AF.

3009--Cynodon dactylon (L.) Pers.

Poaceae <Cynodonteae>: *Cynodon dactylon*

This cosmopolitan species of tropical to warm temperate regions is widely grown in lawns, and has become frequently naturalized in southern regions. It behaves somewhat as a warm-season equivalent to fescue, with much utility for pastures, lawns and erosion control. *C. dactylon* has been widespread in Ky. for a century or more (Gm); see also note under *Muhlenbergia schreberi*. Anderson (1924) noted: "grows everywhere, especially along railroad embankments, where it is frequently planted as a soil binder. Spreads rapidly by its stolons. but rarely perfects seed." As in most other species of the genus, both diploids and tetraploids are known ($2n = 18$ and 36).

ALI S? **HAB F-10,9 D 5.** **ABU +6.**

3010--Eleusine indica (L.) Gaertn.

Poaceae <Cynodonteae>: *Eleusine indica*

This diploid ($2n = 18$) is a cosmopolitan, trampling-resistant weed of fertile soils in tropical and temperate regions. It has probably been present in Ky. since early after settlement; a coll. of P. Peter from Lexington in 1833 was lost in the 1948 fire at KY (Anderson 1924). In 1914 Gm noted: "a grass of dooryards where it thrives about ash heaps and along little use walks... Animals eat it freely... among our best grasses in the matter of nutritive constituents."

ALI EU. **HAB G-10 :: D 6.** **ABU +6.**

3011--Gymnopogon ambiguus (Michx.) B.S.P.

Poaceae <Cynodonteae>: *Gymnopogon ambiguus*

In Ky. this southeastern species is rare and occurs mostly on acid infertile soils in good diverse remnants of open woodland or grassland. There are also disjunct populations in s. Ill., s. Ind. and s. Ohio (FNA 25).

HAB 10 B 5. **ABU g9 s5 -5.**

3012--Gymnopogon brevifolius Trin.

Poaceae <Cynodonteae>: *Gymnopogon brevifolius*

This species occurs mostly on seasonally wet acid infertile soils in open woodland and grassland on the southeastern Coastal Plain. There are several

disjunct inland populations in Miss., Ala., Ga. and s. Tenn. (FNA 25), but only one in Ky. These plants in PULA grow in a highly diverse unique remnant of native vegetation on acid xerohydric soils; see also *Drosera brevifolia*.

HAB 9 B 5. **ABU g8 s3 -5?**

3013--Spartina pectinata Bosc ex Link

Poaceae <Cynodonteae>: *Spartina pectinata*

This variable species occurs in diverse types of seasonally wet habitat, mostly from the northern Great Plains to the North Atlantic Coast. In Ky. it is largely restricted to marshy places on some riverbanks. The few records inland suggest that, before settlement, it might have been more widespread. See also notes under *Panicum virgatum*, which has similar distribution. Both species have cytological variation that needs more research; $2n = 40$ to 94 in *S. pectinata* (FNA 25).

HAB 1,2,9 D 5. **ABU g10 s7 -4.**

3014--Dichanthelium commonsianum (Ashe) Freckmann T

Poaceae <Paniceae>: *Dichanthelium* <*Lanuginosa*> [*Panicum*] *commonsianum* (ovale ssp. *pseudopubescens*, var. *addisonii*)

This may occur in the state, but it is close to *villosissimum* and a critical revision of colls. is needed. It appears transitional from *villosissimum* to the more southeastern *D. ovale* (Ell.) Gould & C.A. Clark, which has longer spikelets and less long hairs on the foliage, and occurs largely on the Coastal Plain. FNA 25 indicated that *commonsianum* (as a subspecies of *ovale*) has a range similar to *villosissimum*, but confirmed colls. from Ky. have not been located.

3015--Dichanthelium villosissimum (Nash) Freckmann

Poaceae <Paniceae>: *Dichanthelium* <*Lanuginosa*> [*Panicum*] *villosissimum* (ovale ssp. *v.*, *acuminatum* var. *villosum*; + *praecocius*)

Variation within this widespread eastern taxon needs further study. Records mapped here include colls. that appear at least transitional to the largely midwestern species, *praecocius*, which has shorter spikelets, narrower blades, and narrower culms (FNA 25). These two taxa can intergrade, and both may be reasonably treated as subspecies of the southeastern species, *ovale* (which in its typical form is unknown in Ky.). They can also intergrade with *acuminatum* (FNA 25). Most taxa of *Dichanthelium* are diploids ($2n = 18$) and hybridization often appears to occur in the genus.

HAB f-10,12 +:: A 5. **ABU g9 s8 -2?**

3016--*Dichanthelium praecocius* (A.S. Hitchc. & Chase) new comb. T

Poaceae <Paniceae>: *Dichanthelium* <Lanuginosa> [*Panicum*] *praecocius* (ovale ssp. p., villosissimum* var. p.)

See notes under villosissimum. Plants matching the description of *praecocius* probably do occur in the state, but colls. are often difficult to distinguish from villosissimum, and records are combined here, pending further study.

3017--*Dichanthelium spretum* (J.A. Schultes) Freckmann T

Poaceae <Paniceae>: *Dichanthelium* <Lanuginosa> [*Panicum*] *spretum* (*acuminatum* ssp. s.)

This taxon occurs mostly on the southeastern Coastal Plain and around the Great Lakes, and it has not been confirmed in Ky. (Hitchcock & Chase 1950, FNA 25). A coll. from CALL (SIU) that is referred here to *longiligulatum* may be at least transitional to *spretum*. These two taxa can be reasonably treated as subspecies of *acuminatum* (FNA 25).

3018--*Dichanthelium longiligulatum* (Nash) Freckmann

Poaceae <Paniceae>: *Dichanthelium* <Lanuginosa> [*Panicum*] *longiligulatum* (*acuminatum* ssp. lo.)

This occurs from southeastern states to South America. It may intergrade with the closely related *lindheimeri* and *spretum*; see notes under those names.

There may also be confusion (or intergradation) with more hairy members of the *acuminatum* group.

HAB 9 :: C 4. **ABU** g10 s7? -4.

3019--*Dichanthelium lindheimeri* (Nash) Gould

Poaceae <Paniceae>: *Dichanthelium* <Lanuginosa> [*Panicum*] *lindheimeri* (*acuminatum* ssp. li.*)

This widespread eastern taxon has been treated as a subspecies of *acuminatum* (FNA 25). It appears to be relatively distinct in Ky., often concentrated on somewhat xerohydric flats. But some colls. from western regions (e.g. CALL at KY-Agr.) appear transitional to the closely related *longiligulatum*, which may not be clearly separable in Ky. Intergradation with *acuminatum* var. *fasciculatum* and var. *implicatum* can also be expected (FNA 25).

HAB 9,10,6,7 :: C 4. **ABU** g10 s8 -4.

3020--*Dichanthelium acuminatum* (Sw.) Gould & C.A. Clark var. *acuminatum*

Poaceae <Paniceae>: *Dichanthelium* <Lanuginosa> [*Panicum*] *acuminatum* var. a. (*lanuginosum*)

In its narrow sense, typical *acuminatum* occurs on the Coastal Plain and through Central to South America (FNA 25). Records from Ky. need to be rechecked, but at least the coll. from LIVI (KY) appears correctly identified. This taxon does intergrade with var. *fasciculatum* and others in the *acuminatum* group.

HAB F-10 :: C 5. **ABU** g10 s5? -4.

3021--*Dichanthelium acuminatum* (Sw.) Gould & C.A. Clark var. *fasciculatum* (Torr.) Freckmann

Poaceae <Paniceae>: *Dichanthelium* <Lanuginosa> [*Panicum*] *acuminatum* var. *fasciculatum* (*tennesseense*)

Within Ky. this is clearly the most widespread segregate of the *acuminatum* group, but there is considerable variation. Included here are colls. that were previously treated as *P. huachucae* Ashe (a less robust form) or *P. tennesseense* Ashe (with relatively glabrous foliage). There can be intergradation with other variants of *acuminatum*, and reportedly also *meridionale*, *columbianum*, *villosissimum*, *dichotomum*, *laxiflorum* and others (FNA 25).

HAB F-10,8,12 :: C 5. **ABU** g10 s10 -1?

3022--*Dichanthelium meridionale* (Ashe) Freckmann

Poaceae <Paniceae>: *Dichanthelium* <Lanuginosa> [*Panicum*] *meridionale* (*acuminatum/lanuginosum* ssp./var. m./*implicatum*)

Mapping here is provisional. This relatively northern and Appalachian taxon does occur in the Interior Low Plateaus and perhaps locally on the Coastal Plain, but there has been confusion with other taxa. It has been treated as a variety or subspecies (FNA 25) of *D. acuminatum*, including var. *implicatum* (Scrib. ex Nash) Gould & Clark, but it also appears transitional to *D. columbianum* (Cr). This taxon is reported to grow in relatively sterile acid soils on damp sites (especially as "*implicatum*") or on dry sites (at least as "*meridionale*"). Its close southern relative, *D. leucothrix* (Nash) Freckmann, is typical of wet pinelands.

The recent treatment by R. LeBlond in W indicates that *meridionale* (as well as relatives not present in Ky.) can be distinguished from *acuminatum* by the very short hairs on its panicle axes, peduncles and vernal culm sheaths: ca. 0.1 mm long (plus occasional longer hairs) versus 0.2-0.5 mm (or occasionally lacking). Also, leaf blades are relatively short (3-6 cm versus 4-12 cm) and

narrow (3-5 mm versus 4-12 mm), typically with sparser longer hairs. Spikelets are usually shorter (1.3-1.7 mm versus 1.5-2 mm in var. fasciculatum).

HAB 12,10,9 ::? A? 4? **ABU** g9 s7? -2?

3023--*Dichanthelium columbianum* (Scribn.) Freckmann

Poaceae <Paniceae>: *Dichanthelium* <*Lanuginosa*> [*Panicum*] *columbianum* (*acuminatum* ssp. c., *sabulorum* var. *thinium*)

Nomenclature, variation and distribution need further study. *D. columbianum* appears to intergrade with *acuminatum*, *lindheimeri*, *meridionale* and other close relatives. It has been recently treated as a largely northeastern subspecies in the *acuminatum* group (FNA 25). However, *columbianum* is relatively distinct in its shorter ligule hairs (0.7-1.5 mm versus 1-5 mm), and dense 0.1-0.4 mm hairs on sheaths and culms as well as longer hairs (versus glabrous); see also Hitchcock & Chase (1950), Y and W. A few Ky. colls. have been referred to *Panicum tsugetorum* Nash (with longer spikelets), which is combined in recent treatments.

HAB 12,10 +:: B 4. **ABU** g9 s8 -2?

3024--*Dichanthelium microcarpon* (Muhl. ex Ell.) Mohlenbrock

Poaceae <Paniceae>: *Dichanthelium* <*Dichanthelium*> [*Panicum*] *microcarpon* (*dichotomum* ssp. m.*, *nididum* var. *ramulosum*)

This widespread southeastern species occurs north to the southern Great Lakes region. It generally appears distinct in Ky., but some colls. appear transitional to *dichotomum* and *yadkinense*. The name *D. dichotomum* var. *ramulosum* (Torr.) LeBlond has been preferred by W.

There are unverified reported from Ky. of other wetland taxa in the *dichotomum* group, often treated as varieties or subspecies (M): *P. nitidum* Lam., *D. lucidum* (Ashe) LeBlond and *D. mattamuskeetense* (Ashe) Mohl. However, these taxa occur largely on the Coastal Plain or Piedmont and are unlikely in Ky. (FNA 25; W).

HAB 9,6 B 4. **ABU** g9 s9 -2.

3025--*Dichanthelium yadkinense* (Ashe) Mohlenbrock

Poaceae <Paniceae>: *Dichanthelium* <*Dichanthelium*> [*Panicum*] *yadkinense* (*dichotomum* ssp. y.*)

This is a widely scattered from east-central states to Mexico but not generally common and often overlooked (FNA 25). To an experienced panicologist, this taxon is generally distinct in appearance and habitat, being concentrated along

sandy banks of larger streams and rivers. It can intergrade with *microcarpon* and perhaps *dichotomum*. The coll. from CARL (MUR) has a short-hairy ligule suggesting hybridization with *acuminatum* or a related species. Most colls. have spikelets shorter than the 2.3-2.5 mm originally noted by Hitchcock & Chase (1950), and indeed FNA 25 has broadened this range to 1.9-2.6 mm.

HAB 1,6 C 4. **ABU** g8 s7 -2.

3026--*Dichanthelium dichotomum* (L.) Gould

Poaceae <Paniceae>: *Dichanthelium* <*Dichanthelium*> [*Panicum*] *dichotomum* (ssp. d.*)

This is widespread in eastern North America, except the upper midwest (FNA 25). Included here are a few colls. previously referable to *Panicum barbdatum* Michx., which is a robust form combined in recent treatments. Also, there are occasional transitions to *microcarpon* and perhaps other species in the *dichotomum* group (Sect. *Dichanthelium*).

HAB 11,7,5 C 2. **ABU** g10 s10 -2.

3027--*Dichanthelium bicknellii* (Nash) new comb.

Poaceae <Paniceae>: *Dichanthelium* <*Dichanthelium*> [*Panicum*] cf. *bicknellii* ("boreale"*)

These scattered plants, found in various rocky woods and glades, are poorly understood. With older treatments, they have mostly been referred to *boreale*, but that is a northern relative of *dichotomum* that was not mapped in Ky. by Hitchcock & Chase (1950) or FNA 25. Reported southern extensions of *boreale* (e.g. Cr) are largely based on plants that appear derived from hybridization among *dichotomum*, *acuminatum*, *linearifolium* or other common species.

Panicum bicknellii Nash and *P. calliphylum* Ashe are older names sometimes considered synonymous with *boreale*, but apparently based on various putative hybrids or introgressants that are similar to the plants mapped here (Hitchcock & Chase 1950; F, FNA 25).

HAB 12,11 + C 3. **ABU** g8? s5? -1?

3028--*Dichanthelium tenue* (Muhl.) Freckmann & Lelong

Poaceae <Paniceae>: *Dichanthelium* <*Ensifolia*> [*Panicum*] *tenue* (*albomarginatum*)

In its broad sense, this species is widely distributed from southeastern states to Central America (FNA 25, W). The colls. mapped here come from sandstone

clifftops in MCRE (KY). They are referable to the relatively glabrous *Panicum albomarginatum* Nash, which has been combined with *tenuis* in recent treatments.

D. tenue in its original narrow sense was applied just to hairier plants on the southern Atlantic Coastal Plain (Hitchcock & Chase 1950). A closely related species, *D. ensifolium* (Bald. ex Ell.) Gould, is known from boggy seeps on the Cumberland Plateau in Tenn., within a few miles of the Ky. border (FNA 25).

HAB 12 +\ A 4. **ABU** g8 s4 =.

3029--*Dichanthelium sphaerocarpon* (Ell.) Gould

Poaceae <Paniceae>: *Dichanthelium* <*Sphaerocarpa*> [*Panicum*] *sphaerocarpon* (var. s.)

This widespread southeastern species extends north to the southern Great Lakes region (FNA 25, K). A few Ky. colls. (e.g. from POWE) may be transitional to *polyanthes*. Elsewhere, hybrids with *acuminatum* and *laxiflorum* are also known (FNA 25).

HAB 8,10,12,6 B 4. **ABU** g10 s9 -2.

3030--*Dichanthelium polyanthes* (J.A. Schultes) Mohlenbrock

Poaceae <Paniceae>: *Dichanthelium* <*Sphaerocarpa*> [*Panicum*] *polyanthes* (*sphaerocarpon* var. *isophyllum*)

This widespread southeastern species has a similar range to its close relative, *sphaerocarpon*, but it tends to occur on damper ground and avoids sterile sands (FNA 25, K). Occasional hybrids with *sphaerocarpon* can be expected (FNA 25).

HAB 6,9,4 C 4. **ABU** g9 s9 -3.

3031--*Dichanthelium ravenelii* (Scribn. & Merr.) Gould

Poaceae <Paniceae>: *Dichanthelium* <*Oligosantha*> [*Panicum*] *ravenelii*
This occurs on relatively deep acid soils in southeastern states. In Ky. it is largely restricted to remnants of original grassland. See notes under *malacophyllum*, which may intergrade.

HAB r-10,8 B 4. **ABU** g9 s7 -4.

3032--*Dichanthelium malacophyllum* (Nash) Gould ?

Poaceae <Paniceae>: *Dichanthelium* <*Oligosantha*> [*Panicum*] cf. *malacophyllum*

This midwestern species is close to *ravenelii* and the more widespread *oligosanthes* (or *scribnerianum*). These species may intergrade (FNA 25). Most colls. mapped here have glabrous upper leaf surfaces (except the coll. from CRIT), and may represent transitions to *ravenelii*.

HAB 10,12? D 4. **ABU** g8 s6 -4.

3033--*Dichanthelium scribnerianum* (Nash) new comb.

Poaceae <Paniceae>: *Dichanthelium* <*Oligosantha*> [*Panicum*] *scribnerianum* (*oligosanthes* var. s.*; *helleri*)

This differs from typical *oligosanthes* in several distinctive characters (Hitchcock & Chase 1950; W, FNA 25). It has a widespread range centered in the midwest, and usually occurs on base-rich soils. *D. scribnerianum* is reported to intergrade with *oligosanthes* locally, and it may also hybridize with *malacophyllum*, *acuminatum* and other species (FNA 25).

Typical *oligosanthes* usually occurs on sandy soils from the Great Lakes to Coastal Plain, and reports from Ky. have not been verified (M). Some Ky. colls. mapped here under *scribnerianum* have also been misidentified as *D. wilcoxianum* (Vasey) Freckmann (= *oligosanthes* var. *w.*), a taxon closer to *linearifolium* that occurs in the upper midwest but that remains unknown in Ky. (M).

HAB f-12,10 D? 5. **ABU** g10 s8 -4.

3034--*Dichanthelium oligosanthes* (J.A. Schultes) Gould T

Poaceae <Paniceae>: *Dichanthelium* <*Oligosantha*> [*Panicum*] *oligosanthes* (var. o.*)

See notes under *scribnerianum*.

3035--*Dichanthelium scoparium* (Lam.) Gould

Poaceae <Paniceae>: *Dichanthelium* <*Clandestina*> [*Panicum*] *scoparium*
This widespread southeastern diploid (2n = 18) usually grows on damp acid soils. It is locally abundant in southern and western regions of Ky., but virtually unknown in northeastern regions. A disjunct site was recently reported in southeastern Ohio (Gardner et al. 2004).

HAB f-9,6,10 B 5. **ABU** g9 s8 -4.

3036--*Dichanthelium clandestinum* (L.) Gould

Poaceae <Paniceae>: *Dichanthelium* <*Clandestina*> [*Panicum*] *clandestinum*
This tetraploid (2n = 36) is widespread and locally abundant in east-central states, especially in thin woods and old fields on moist to damp fertile soils.

D. clandestinum has sometimes been misidentified as *latifolium*, especially when incomplete specimens lack lower sheaths. It has papillose-based hairs on lower sheaths and lower leaf margins (versus absent in *latifolium*); blades are longer on average (10-28 cm versus 7-18 cm). Also, its spikelets tend to be shorter (2.4-3.6 mm versus 2.9-4.1 mm), as do its first glumes (1.2-1.8 mm versus 1.5-2.2 mm).

HAB 7,6,10,3 D 4. **ABU** g10 s10 -3.

3037--*Dichanthelium commutatum* (J.A. Schultes) Gould

Poaceae <Paniceae>: *Dichanthelium* <Macrocarpa> [*Panicum*] *commutatum* (var. c.)

In a broader definition, *commutatum* includes *joorii* and *ashei* as subspecies (FNA 25). Typical *commutatum*, as mapped here, is the most widespread segregate, extending from eastern states to South America.

HAB 7,11,5 C 3. **ABU** g9 s9 -2.

3038--*Dichanthelium ashei* (Pearson ex Ashe) new comb.

Poaceae <Paniceae>: *Dichanthelium* <Macrocarpa> [*Panicum*] *ashei* (*commutatum* var. a.*)

Although close to *commutatum* and perhaps intergrading in some cases, *ashei* is a generally distinct southeastern segregate. Moreover, *ashei* is consistently found in subxeric to xeric woods on acid infertile soils, while *commutatum* occurs in more mesic-tending woods. The combinations ssp. *ashei* (Pearson ex Ashe) Freckman & Lelong and var. *ashei* (Pearson ex Ashe) Mohlenbrock are available, but species status may be warranted.

D. ashei differs in its narrower upper leaves (ca. 5-10 mm wide versus 10-20 mm) and slightly shorter spikelets (on average); see also Anderson (1924).

Unlike *ashei*, typical *commutatum* tends to have blades increasing markedly up the culms, and the culms tend to be more spreading.

HAB 11 B 3. **ABU** g9 s8 -1.

3039--*Dichanthelium joorii* (Vasey) Mohlenbrock

Poaceae <Paniceae>: *Dichanthelium* <Macrocarpa> [*Panicum*] *joorii* (*commutatum* var. j.)

Recognition of this species was advanced by Mohlenbrock (1985), but it was treated as a subspecies in FNA 25. *D. joorii* is widely scattered in the central Mississippi and lower Ohio Valleys, and perhaps south to Mexico (FNA 25), but unknown in Atlantic states (W). It typically occurs in subhydric to

submesic woods, especially on riparian levees, mossy banks and hummocks along medium to small-sized streams. Further collection is needed to document its range and improve description.

Although *joorii* is close to *commutatum*, complete colls. can be reliably distinguished. *D. joorii* differs in its more elongated spikelets (up to 2.9-3.2 mm versus 2.6-2.9 mm), with more pointed lemmas; panicles tend to be smaller (mostly 3-9 cm long versus 6-12 cm); blades are falcate (versus almost symmetric at base); culms are usually shorter (mostly 20-40 cm versus 40-70 cm), and decumbent to sprawling from loose caudices or rhizomes (versus erect and cespitose).

HAB 6,4 C 2. **ABU** g8 s7 -4.

3040--*Dichanthelium leibergii* (Vasey) Freckmann R

Poaceae <Paniceae>: *Dichanthelium* <Macrocarpa> [*Panicum*] *leibergii*

This diploid (2n = 18) occurs mostly in the upper midwest, but extending close to Ky. in s. Ill. and s. Ohio (FNA 25). It has been reported from Ky. (J), but confirmed colls. have not been located. A provisional report from HARD by R. Cranfill (pers. comm. to M) was based on a misidentified coll. of *boscii* (KY).

3041--*Dichanthelium boscii* (Poir.) Gould & C.A. Clark var. *boscii*

Poaceae <Paniceae>: *Dichanthelium* <Macrocarpa> [*Panicum*] *boscii* var. b. This widespread southeastern species has sometimes been confused with the northeastern *latifolium* (see notes under that species). Within both species, 2n = 18 and 36, but segregates are not generally recognized.

HAB 11,7,5 C 1. **ABU** g10 s10 -2.

3042--*Dichanthelium boscii* (Poir.) Gould & C.A. Clark var. *molle* (Vasey) Mohlenbrock

Poaceae <Paniceae>: *Dichanthelium* <Macrocarpa> [*Panicum*] *boscii* var. *molle*

This hairy variety is not recognized in most current treatments, but it seems to have a relatively southern range overall. Within Ky. it occurs locally in old transitions between woodland and grassland, where there is probably a long history of fire. Var. *molle* is easily confused with *ravenelii* or *malacophyllum*, but lacks the hairy ligule of those species.

HAB 11,10 B 2. **ABU** g9 s7? -3.

3043--*Dichanthelium latifolium* (L.) Gould & C.A. Clark

Poaceae <Paniceae>: *Dichanthelium* <Macrocarpa> [*Panicum*] *latifolium* (commutatum var. l.)

This northeastern species occurs locally in the Southern Appalachians (W). The only confirmed Ky. records are from the Cumberland Mts. B collected it only on Big Black Mt. in HARL (US); see also notes in Hitchcock & Chase (1950). In Tenn., it is known from a few northeastern counties adjacent to Ky. and Va. (TENN). There have been many erroneous records in southeastern states; the uncertain records mapped here (and many records in FNA 25) need to be rechecked.

D. latifolium is close to *boscii* (spikelets 3.8-5.2 mm) and *commutatum* (spikelets 2.2-3.2 mm), appearing intermediate in spikelets and other characters, including sometimes slightly bearded nodes (FNA 25). See also notes under *clandestinum*, which has often been confused.

HAB 11,5,7 C 2. **ABU** g9 s5? -2?

3044--*Dichanthelium aciculare* (Desv. ex Poir.) Gould & C.A. Clark T
Poaceae <Paniceae>: *Dichanthelium* <Angustifolia> [*Panicum*] *aciculare* (ssp. a.)

Some western colls. included here under *angustifolium* (in CALL, HARD, MARS) have been identified as the closely related *aciculare*, using older treatments. However, these colls. do not seem particularly distinct, and *aciculare* in its narrow sense occurs well south of Ky. (Hitchcock & Chase 1950, FNA 25). The two taxa were combined as subspecies of *aciculare* in FNA 25.

3045--*Dichanthelium angustifolium* (Ell.) Gould

Poaceae <Paniceae>: *Dichanthelium* <Angustifolia> [*Panicum*] *angustifolium* (*aciculare* ssp. a.*)

This occurs on dry acid soils in southeastern states. See notes under *aciculare*; the *aciculare* group (Sect. *Angustifolia*) contains several intergrading species or subspecies. Also, there are occasional hybrids with diploids in other groups (FNA 25).

HAB 10,12? B 5. **ABU** g9 s5 -4.

3046--*Dichanthelium laxiflorum* (Lam.) Gould

Poaceae <Paniceae>: *Dichanthelium* <Strigosa> [*Panicum*] *laxiflorum* (*xalapense*)

This is widespread from southeastern states to Central America. Hairier plants have been called *Panicum xalapense* H.B.K., but that does not seem to be a significant segregate (FNA 25).

HAB f-7,8,10 :: C 4. **ABU** g9 s9 -2?

3047--*Dichanthelium linearifolium* (Scribn. ex Nash) Gould

Poaceae <Paniceae>: *Dichanthelium* <Linearifolia> [*Panicum*] *linearifolium* (*wernerii*)

This is a widespread eastern species. Included here are relatively glabrous plants that have been named var. *wernerii* (Scribn.) Mohlenbrock. Those plants are relatively frequent in more northern regions, but within Ky. they do not appear to have significant difference in distribution.

HAB 12,10 + D 6? **ABU** g10 s9 -2.

3048--*Dichanthelium depauperatum* (Muhl.) Gould

Poaceae <Paniceae>: *Dichanthelium* <Linearifolia> [*Panicum*] *depauperatum*

This is another widespread eastern species. Included here are relatively glabrous plants that have been named var. *psilophyllum* Fern. (within *Panicum*), These are relatively frequent in more northern regions, but within Ky. they do not appear to have significant difference in distribution.

HAB 12,10 + B 5. **ABU** g10 s9 -2.

3049--*Panicum flexile* (Gattinger) Scribn.

Poaceae <Paniceae>: *Panicum* <Paniceae> *flexile*

This annual is widely scattered across eastern states, but largely restricted to seasonally dry base-rich soils (FNA 25). See notes under *capillare*, *gattingeri* and *philadelphicum*; these species are all diploids (2n = 18), and some intergradation among them is possible.

HAB r-12,10 +:: E 6. **ABU** g10 s9 +1?

3050--*Panicum capillare* L.

Poaceae <Paniceae>: *Panicum* <Paniceae> *capillare* (var. c.)

This a widespread weedy annual in most temperate regions of North America. It is reported to hybridize with *gattingeri*, especially in southeastern states (FNA 25). Depauperate colls. from dry rocky sites should be rechecked for possible reassignment.

HAB H-10,8 ::: D 6. **ABU** g10 s10 +2.

3051--*Panicum gattingeri* Nash

Poaceae <Paniceae>: *Panicum* <Paniceae> *gattereri* (*philadelphicum* ssp. g.* / var. *campestre*; *capillare* var. *campestre/geniculatum*)
This is probably widespread in east-central states, but there has been much confusion with the related species, *capillare* and especially *philadelphicum* (Hitchcock & Chase 1950; FNA 25). Some intergradation with both of those species may occur, and *gattereri* is sometimes treated as a segregate of either one; see Haines et al. (2011) for a northeastern perspective. In Ky. *gattereri* is usually distinct and typically occurs on calcareous soils in habitats intermediate between the damp cultivated soils typical of *capillare* and the seasonally dry or rocky ground typical of *flexile*.
HAB h-10,12,8 ::: D 6. **ABU** g9 s9 -1?

3052--*Panicum philadelphicum* Bernh. ex Trin.

Poaceae <Paniceae>: *Panicum* <Paniceae> *philadelphicum* (ssp. p.*, *capillare* var. *sylvaticum*)
This is close to *gattereri*, but concentrated in more northeastern states (Hitchcock & Chase 1950; FNA 25; Haines et al. 2011). It may be associated more with drier non-calcareous soils, including sands but avoiding damp clays.
HAB r-10,12? ::+ C 6. **ABU** g9 s8 -1?

3053--*Panicum miliaceum* L.

Poaceae <Paniceae>: *Panicum* <Paniceae> *miliaceum* (sensu lato)
The exact identity and status of these varied plants needs further investigation. *P. miliaceum* (a "millet") originates from Asia, and several cultivars exist as well as wild types; chromosome numbers range from $2n = 36$ to 72 (FNA 25). FNA 25 indicates that more robust plants with disarticulating florets can be distinguished as ssp. *ruderales* (Kitagawa) Tzvelev, and that this is naturalized in much of North America. The species has been grown for at least a century in Ky. (Gm). Currently much seed is fed to birds or spilled, and some colls. probably come from resultant waifs. Some colls. mapped here have much smaller spikelets than reported in FNA and other manuals: ca. 2.5-3 mm versus 4.5-6 mm.
ALI AS. **HAB** H-10 ::: D? 5. **ABU** +4.

3054--*Panicum dichotomiflorum* Michx.

Poaceae <Paniceae>: *Panicum* <Paniceae> *dichotomiflorum*
This is a widespread variable weed of eastern North America; $2n = 36$ and 54 (FNA 25). A coll. from BALL (MUR) is referable to var. *geniculata* (Wood) Fern., which is not recognized in recent treatments. A coll. from JACK (EKY)

has been referred to var. *puritanorum* Svens., which is considered a somewhat distinct subspecies in FNA 25, typical of receding shorelines in northeastern regions but otherwise unknown in Ky. Further research is needed to determine the status of these potential segregates.
HAB H-10,9,6,1 ::: D 6. **ABU** g10 s10 +3.

3055--*Panicum longifolium* Torr.

Poaceae <Paniceae>: *Panicum* <Agrostoides> *longifolium* (*rigidulum* var. *pubescens**)
This is widely scattered in eastern states, but concentrated on the southeastern Coastal Plain. It is reasonably treated as a distinct species (see also W), but it has often been treated as a variety of *rigidulum* (e.g. FNA 25). In Ky. and Tenn. it occurs mostly on hydroxeric streamhead flats and meadows of the southern Cumberland Plateau.
HAB 9 B 5. **ABU** g9 s5 -3.

3056--*Panicum rigidulum* Bosc ex Nees var. *rigidulum*

Poaceae <Paniceae>: *Panicum* <Agrostoides> *rigidulum* var. r. (*agrostoides*)
This species is widespread in eastern states, except the upper midwest (FNA 25).
Variation in the *rigidulum* complex needs further study, though polyploidy is unknown; $2n = 18$ in all reports (FNA 25). Some colls. mapped here need to be rechecked for possible assignment to var. *elongatum*; see also P. *longifolium*.
HAB f-9,2 C 5. **ABU** g10 s9 -2.

3057--*Panicum rigidulum* Bosc ex Nees var. *elongatum* (Pursh) Lelong

Poaceae <Paniceae>: *Panicum* <Agrostoides> *rigidulum* var. *elongatum* (P. *stipitatum*)
Distinction from typical *rigidulum* needs further study. Var. *elongatum* is reported to have a more eastern range, concentrated on the Piedmont and other plains around the Appalachians, but there is much overlap and no clear difference in habitat (FNA 25, W). In addition to its more elongated spikelets, var. *elongatum* tends to be more robust, with narrower inflorescences (more ascending branches), and more purple-tinged.
HAB 2,9 C 5. **ABU** g9 s8 -2.

3058--*Panicum anceps* Michx.

Poaceae <Paniceae>: *Panicum* <Agrostoides> *anceps* (var. a.)

This widespread southeastern species is one of the most common native perennial grasses in pastures and old fields on average soils, along with *Tridens flavus* and *Andropogon virginicus*. Variation needs further study; $2n = 18$ and 36 (FNA 25).

HAB F-10,8 C 5. **ABU** g10 s10 +3.

3059--*Panicum anceps* Michx. var. *rhizomatum* (A.S. Hitchc. & Chase) Fern. R

Poaceae <Paniceae>: *Panicum* <Agrostoides> *anceps* var. *rhizomatum*
This southeastern taxon occurs largely on the Coastal Plain. It has been reported from Ky. by RAB, Bryan (1977) and others, but no coll. has been located. It is verified in Tenn., and should be looked for across w. Ky. in thin woods or edges with more seasonal water-stresses than the old fields and pastures of typical *anceps* (Ch, FNA 25, W).

Var. *rhizomatum* is sometimes considered a distinct species (Hitchcock & Chase 1950). It differs from typical *anceps* in its longer rhizome segments (up to ca. 5-10 cm versus 1-5 cm); its more hairy sheath summits and blade bases (densely villous versus sparsely pilose to glabrous); its more contracted panicles; and its smaller spikelets (mostly 2.3-2.8 mm long versus 2.7-3.9 mm), which are less acuminate-falcate and often purplish (resembling *rigidulum*).

3060--*Panicum virgatum* L.

Poaceae <Paniceae>: *Panicum* <Repentia> *virgatum*
As a native species in Ky., "switch-grass" is now largely restricted to river banks or nearby lowlands. A few records suggest that before settlement it may have occurred more widely in seasonally damp grasslands on uplands of western regions. However, it is becoming widely sown for wildlife habitat, and some outlying colls. may result from such activity. Records from probable sowings or escapes are excluded here, but such plants are becoming increasing difficult to distinguish from native plants.

Across its broad North American range, *virgatum* is highly variable in chromosome number ($2n = 18$ to 108), overall size, morphology, and habitat (FNA 25). Some seed planted in Ky. is the relatively robust "Cave-in-Rock" cultivar, which originated from the Ohio Rv. banks in Ill. across from CRIT. Much other seed comes from the Great Plains.

HAB f-1,9,10 D 5. **ABU** g10 s7 -3.

3061--*Panicum verrucosum* Muhl.

Poaceae <Paniceae>: *Panicum* <Verrucoseae> *verrucosum*
This is a distinctive annual tetraploid ($2n = 36$), ranging widely across southeastern states but concentrated on the Coastal Plain. It is largely restricted to open areas on boggy, acid soils (FNA 25). West of the Appalachians in Ky. and Tenn., populations are mostly small and fragmented.
HAB 9,6 ::: A 6. **ABU** g8 s8 -2.

3062--*Steinchisma hians* (Ell.) Nash R

Poaceae <Paniceae>: *Steinchisma* [*Panicum*] *hians*
This is a southern species of wet shores that extends north to se. Mo. and scattered sites across Tenn., including some counties adjacent to Ky. (Ch, FNA 25). It was reported from Ky. by RAB but no coll. has been verified.

3063--*Urochloa platyphylla* (Munro ex Wright) R. Webster

Poaceae <Paniceae>: *Urochloa* (*Brachiaria*) *platyphylla* (*Brachiaria* p.)
This tetraploid ($2n = 36$) is a widespread weedy species of damp alluvial soils in warm humid American regions. It appears to have spread north in recent decades, and may be largely adventive in southeastern states. The first record from Ky. was provided by Browne & Athey (1976). It is often concentrated in cropped field edges, wildlife openings, rough woodland trails and similar sites.

ALI s. **HAB** h-1,4,9 ::? D 6? **ABU** g9? s6? -2?

3064--*Urochloa ramosa* (L.) Nguyen

Poaceae <Paniceae>: *Urochloa* (*Brachiaria*) *ramosa* (*Brachiaria* r.)
This is a variable tropical weed from Asia and Africa; $2n = 36$ in most reports (FNA 25). It is cultivated sometimes for seed to feed birds, including waterfowl, and has now spread across southeastern states, mostly on the Coastal Plain. Some colls. mapped here may be derived from plantings, rather than truly naturalized populations.
ALI AS. **HAB** H-10 ::? C 6. **ABU** +4.

3065--*Urochloa texana* (Buckl.) R. Webster

Poaceae <Paniceae>: *Urochloa* (*Brachiaria*) *texana* (*Brachiaria* t.)
This hexaploid ($2n = 54$) is native to n. Mexico, Tex. and perhaps adjacent states (FNA 25). It has become more widespread across southern states due to its weedy nature in modern farmland.
ALI s. **HAB** H-10 ::? D 6. **ABU** g8? s4? -2?

3066--*Eriochloa acuminata* (J. Presl) KunthPoaceae <Paniceae>: *Eriochloa acuminata* (lemmonii var. gracilis)

This southwestern annual may be largely adventive in southeastern states.

ALI w. **HAB** H-9,10 ::? D 6. **ABU** g8? s4? -2?**3067--*Eriochloa contracta* Hitch. W**Poaceae <Paniceae>: *Eriochloa contracta*This annual occurs mostly in south-central states and has become adventive to the west and east. Since 2010 it has been reported from roadsides in BOON and MCRE by D. Boone (pers. comm.). *E. contracta* is similar to *acuminata*, and "intermediate forms can be found"; 2n = 36 in both taxa (FNA 25).**ALI** w.**3068--*Digitaria ischaemum* (Schreb.) Schreb. ex Muhl.**Poaceae <Paniceae>: *Digitaria ischaemum* (?glabra; + var. mississippiensis)This alien weed is widespread in eastern states and more scattered in the west (FNA 25). The earliest report from Ky. was under the old synonym *D. glabra* Beauv., by Short & Peter (1835).

Variation in this species needs further review. Although not recognized by J.K. Wipff (FNA 25), var. mississippiensis (Gattinger) Fern. was previously considered to be a robust native variant in the eastern U.S.A., especially southern regions (F). Colls. from HARD (Medley et al. 19778-92 for WKY) and probably elsewhere do fit the description of var. mississippiensis.

ALI EU. **HAB** R-10,9 :::: D 6. **ABU** +6.**3069--*Digitaria violascens* Link**Poaceae <Paniceae>: *Digitaria violascens*

This largely tropical or subtropical species has been considered native to both Western and Eastern Hemispheres, but J.K. Wipff (FNA 25) indicated only the Eastern.

Both *ischaemum* and *violascens* have spikelets in groups of 3-5 at least in middle portions of inflorescence branches; fertile lemmas are light to dark brown or blackish; leaves are largely glabrous; 2n = 36 (FNA 25). *D. violascens* differs from *ischaemum* in its lack of axillary panicles, smaller spikelets (1.2-1.7 mm long versus 1.7-2.3 mm), unequal glumes (x 0.75 versus subequal), and lack of capitate hairs in spikelets (see also W).

ALI EU. **HAB** R-10,12 ::+ B 6. **ABU** +4.**3070--*Digitaria sanguinalis* (L.) Scop.**Poaceae <Paniceae>: *Digitaria sanguinalis* (var. c.)This widespread alien weed may have been present in North America since early after settlement; see Gray (1864) under *Panicum*. But the first colls. in Ky. appear to have been made by Kearney, Pr and Gm during the 1890s. In 1914 Gm noted: "one of our most troublesome grass weeds, occurring everywhere in cultivated ground, in meadows, pastures, lawns, and along roadsides."

Colls. need to be rechecked for the supposedly native species, *ciliaris*; see notes under that name. Both *sanguinalis* and *ciliaris* have paired spikelets; their fertile lemmas are yellow or gray to brown (sometimes purplish); and their lower sheaths are pilose; 2n = 28-54 (FNA 25).

ALI EU. **HAB** S-10 :::: D 6. **ABU** +6.**3071--*Digitaria ciliaris* (Retz.) Koel. T**Poaceae <Paniceae>: *Digitaria ciliaris* (*sanguinalis* var. c.)This was recently reported by Weckman et al. (2003) from POWE (EKY) and by D. Boone (pers. comm.) from BOON (for KNK), but further verification is needed. Although older manuals largely neglected *ciliaris*, J.K. Wipff (FNA 25) indicated that it is native to warmer regions of the Western Hemisphere, common in southern states and extending north in the Ohio Valley to s. Ill. and s. Ind. *D. ciliaris* appears to have been confused with *sanguinalis*, and may intergrade (Cr).

D. ciliaris differs from typical *sanguinalis* in its generally larger upper (fertile) lemmas (2.5-4 mm versus 1.7-3 mm), lower lemmas with lateral veins glabrous or scabridulous in the distal third (versus scabrous in the distal two-thirds), and its blades with papillose-based hairs generally restricted to the base of adaxial surfaces (versus usually distributed over both surfaces); 2n = 54 (versus 28-54). Further complicating the situation is the reported presence of the southeast Asian *D. ciliaris* var. *chrysolephara* (Fig. & De Not.) R.R. Stewart, which has distinctive "glassy yellow hairs" on lower lemmas between the inner veins; the coll. from BOON does appear to be that taxon.

ALI s. **HAB** R-10? :::: C 6. **ABU** g9? s5? -3?**3072--*Digitaria filiformis* (L.) Koel.**Poaceae <Paniceae>: *Digitaria* <*Leptoloma*> *filiformis*

This is a widespread variable weedy species in southeastern states and n. Mexico, with concentration on the Coastal Plain; 2n = 36 and 54. It is locally

frequent in far-western counties of Ky. (see also Gm), but there are only scattered records from central regions.

HAB H-10 ::? C 6. **ABU** g9 s7 -3?

3073--*Digitaria cognata* (J.A. Schultes) Pilger

Poaceae <Paniceae>: *Digitaria* <Leptoloma> *cognata*

This tetraploid ($2n = 36$) is widely scattered in eastern states but concentrated on dry sandy soils in a broad band from the Great Lakes to Tex. and La., and also on the Coastal Plain to southern New England (FNA 25). As in Ky., the species is generally uncommon between these two zones.

HAB h-10 ::? B 6. **ABU** g10 s7 -3?

3074--*Paspalum repens* Berg.

Poaceae <Paniceae>: *Paspalum repens* (fluitans, mucronatum)

This widespread diploid ($2n = 20$) of swampy shorelines ranges from southeastern states to tropical America. Based on their less robust annual habit, the more northern plants in eastern states have been segregated as *P. repens* var. *fluitans* (Ell.) J. Wipff & S.D. Jones, or even as a distinct species (Cr, W). However, some recent treatments have merged these two taxa (e.g. FNA 25, Y).

HAB 1,2 ~:: D 6. **ABU** g9? s8 -3.

3075--*Paspalum dissectum* (L.) L.

Poaceae <Paniceae>: *Paspalum dissectum*

This southeastern species is similar to *laeve* but with smaller spikelets (ca. 1.7-2.1 x 1-1.4 mm versus 2.3-3.3 x 2-2.7 mm), broadly winged branch axes (1.8-3 mm wide versus 0.6-1.3 mm), mostly shorter narrower leaves, and more decumbent habit; $2n = 40$ and 60 (FNA 25). It occurs on wetter sites than *laeve*, especially shorelines. The outlying northern coll. from JEFF (KY) was made by C.W. Short in 1840 at Louisville.

HAB 2 ~:: D 6. **ABU** g8 s6? -3?

3076--*Paspalum laeve* Michx. var. *pilosum* Scribn.

Poaceae <Paniceae>: *Paspalum laeve* var. *pilosum* (*P. longipilum*)

This hairy variety is not recognized in recent treatments, but within Ky. it appears more frequent to the south. It has a somewhat more southern overall range (Hitchcock & Chase 1950).

HAB F-10,8 C 5. **ABU** g9 s8? +1?

3077--*Paspalum laeve* Michx. var. *laeve*

Poaceae <Paniceae>: *Paspalum laeve* var. l.

Variation within this widespread southeastern species deserves further study; $2n = 20$ to 80 (FNA 25). Most plants in Ky. are referable to var. *pilosum*, with spikelets ca. 2-2.5 mm long, 2-3 inflorescence branches and smooth foliage. Some records mapped here may be transferable to var. *pilosum* or var. *circularare*.

HAB F-10,8 C 5. **ABU** g9 s9 +3.

3078--*Paspalum laeve* Michx. var. *circularare* (Nash) Stone

Poaceae <Paniceae>: *Paspalum laeve* var. *circularare*

This variety is not recognized in recent treatments, but its relatively large orbicular spikelets seem distinct, and it has a somewhat more northern range than typical var. *laeve* (Hitchcock & Chase 1950).

HAB F-10,8 C 5. **ABU** g9 s5? -1?

3079--*Paspalum distichum* L.

Poaceae <Paniceae>: *Paspalum distichum* (*paspaloides*, "vaginatum")

This is a widespread variable weedy species of shorelines, ditches and wet fields, from southern states to South America; $2n = 20$ to 61 (FNA 25). The closely related Central and South American species, *P. notatum* Flugge ("bahia-grass"), has been widely planted on the southeastern Coastal Plain, and may be expected in western Ky. (FNA 25).

HAB h-9,2 :: D 6. **ABU** g10 s6? -4.

3080--*Paspalum longepedunculatum* Le Conte

Poaceae <Paniceae>: *Paspalum longepedunculatum* (*setaceum** var. l.)

This is part of the *setaceum* complex, for which mapping here remains somewhat tentative. Only diploids ($2n = 20$) are known in this widespread southeastern complex, and the segregates are sometimes hard to distinguish (FNA 25). Both *longepedunculatum* and typical *setaceum* have ranges concentrated on the Coastal Plain. Ky. records of both taxa are mostly from dry sandy soils in southeastern counties. The coll. mapped here from JEFF (MM for WKY) may represent a waif, found near railroad tracks.

P. longepedunculatum has been treated as a variety or subspecies within *setaceum* (FNA 25), but it is more distinct than most other included taxa. It has relatively short spikelets (1.4-1.8 mm), and leaves that are conspicuously basal, recurved, typically narrower, and usually glabrous. Typical *setaceum* also has relatively short spikelets (ca. 1.5-1.7 mm), compared to most other taxa in this complex.

ALI s. HAB R-10 B 5. ABU g9 s5 -3?

3081--Paspalum setaceum Michx. var. setaceum T

Poaceae <Paniceae>: Paspalum setaceum var. se.

See notes under longepedunculatum, which is closely related. The two reported Ky. colls. of typical setaceum need confirmation: from BELL and LETC (B; see US). Var. setaceum is also close to var. stramineum, differing in its relatively narrow, more hairy, and more grayish-green leaves (versus yellowish- to dark green in var. stramineum); also, its spikelets are relatively short (mostly 1.5-1.7 mm versus 1.7-2.4 mm).

HAB G-10,12 B 5.

3082--Paspalum setaceum Michx. var. stramineum (Nash) D. Banks

Poaceae <Paniceae>: Paspalum setaceum var. stramineum

This variety is reported to have a relatively western range, but the few Ky. records are only from central counties. FNA 25 indicated that it is close to var. muhlenbergii, with spikelets that are generally shorter, paler and more hairy. In earlier treatment, F and Hitchcock & Chase (1950) stated that its blades are minutely puberulent, but this character was omitted in FNA 25; further revision or explanation is needed.

HAB G-10,12 B 5. ABU g10 s4? -3?

3083--Paspalum setaceum Michx. var. ciliatifolium (Michx.) Vasey

Poaceae <Paniceae>: Paspalum setaceum var. ciliatifolium

This relatively smooth variety may be more frequent to the south within Ky. (often on sandy soils), and its global range is slightly more southern than var. muhlenbergii. However, the degree of biological and ecological distinction seems rather small.

HAB G-10,12 C 5. ABU g10 s8 -1?

3084--Paspalum setaceum Michx. var. muhlenbergii (Nash) D. Banks

Poaceae <Paniceae>: Paspalum setaceum var. muhlenbergii (P. pubescens)

This hairy variety extends more into northeastern states and adjacent Canada, compared to other varieties, but with no clear difference in habitat. It appears to be relatively frequent in Ky.

HAB G-10,8 D 5. ABU g10 s9 +1?

3085--Paspalum pubiflorum Rupr. ex Fourn.

Poaceae <Paniceae>: Paspalum pubiflorum (laeviglume; + var. glabrum)

This is widespread from southeastern states to Mexico and Cuba, especially on fertile soils in mowed or trampled areas; $2n = 60$ and ca. 64 (FNA 25). P. pubiflorum is similar to setaceum, but has larger spikelets (2.8-3.6 mm versus 1.4-2.6 mm), longer ligules (1-3.2 mm versus 0.2-0.5 mm), and a more decumbent habit, rooting at the nodes. All Ky. colls. are referable to var. glabrum Vasey ex Scribn., but that segregate is not considered distinct in recent treatments (FNA 25). Typical var. pubiflorum is less robust, more hairy, and is reported to have a relatively southwestern range (Hitchcock & Chase 1950; F, W).

HAB R-9,10,6,7 D 5. ABU g10 s10 +1?

3086--Paspalum floridanum Michx. var. floridanum

Poaceae <Paniceae>: Paspalum floridanum var. f.

This species is a high polyploid ($2n = 120-170$) that is sometimes difficult to distinguish from the more widespread pubiflorum (FNA 25). Both have southeastern ranges, but pubiflorum extends further inland, and occurs on relatively fertile soils. P. floridanum differs in its rhizomatous habit with erect culms, 8-21 dm tall (versus stoloniferous, 3-13 dm tall); its spikelets are strictly glabrous (versus often hairy), usually larger (2.9-4.3 x 1.9-3.1 mm versus 2.5-3.6 x 1.3-2.4 mm), more or less suborbicular (versus elliptic to obovate), with upper florets often golden-brown (versus just pale to tan).

Var. floridanum itself is relatively hairy, and generally associated with acid soils (including pinewoods further south). It appears to be rare in Ky. (F). A related species, P. bifidum (Bertoloni) Nash, is known mostly from longleaf pine savannas but extends north to sandy soils of se. Mo. and w. Tenn.

ALI s. HAB R-9 C 5. ABU g9 s3? -3?

3087--Paspalum floridanum Michx. var. glabratum Engelm. ex Vasey

Poaceae <Paniceae>: Paspalum floridanum var. glabratum

See notes under var. floridanum. Var. glabratum is a relatively robust, glabrous, glaucous segregate that extends into the central Mississippi and lower Ohio Valleys, often on more base-rich soils (F). There is a disjunct cluster of records for var. glabratum around the Bluegrass region of Ky., Ind. and Ohio (FNA 25; see also FNA's Grass Manual on the web).

ALI s. HAB R-9,6,1 E? 5. ABU g9 s8 -3?

3088--Paspalum bosceanum Flueggé

Poaceae <Paniceae>: Paspalum bosceanum

This widespread tetraploid ($2n = 40$) of warm temperate to tropical regions extends up the Mississippi Valley to a somewhat disjunct cluster of records in w. Ky. and adjacent Stewart Co., Tenn. (Cr, Ch, FNA 25). There is also a disjunct cluster of largely pre-1950 records in the Tennessee Valley around Knoxville (Ch; E. Wofford, pers. comm.). Although sometimes found in farmland, its more natural habitats include sandbars along larger medium-sized streams.

P. boschianum is easily overlooked. Differences from similar species (especially *pubiflorum*) include its annual habit (versus perennial), and its dark brown fertile lemmas at maturity (versus stramineous or pale brown), with obovate to orbicular shape (versus variously shaped).

ALI s. **HAB** H-9,1? :: C? 6. **ABU** g10 s5? -3?

3089--Paspalum dilatatum Poir.

Poaceae <Paniceae>: *Paspalum dilatatum*

This variable South American species ("dallis-grass") has been widely sown in warm regions of North America for forage and other mowed turf; $2n = 20$ to 63 (FNA 25). It prospers locally along roadsides in southern regions of Ky. but remains virtually unknown along the state's northern borders. The first Ky. record comes from Pr (handwritten addenda) in the 1890s; see also Anderson (1924). *P. dilatatum* and *P. urvillei* are the only members of the genus in Ky. with distinctly long-pilose spikelets.

ALI S. **HAB** G-9,10,6 D 5. **ABU** +4.

3090--Paspalum urvillei Steud. W

Poaceae <Paniceae>: *Paspalum urvillei*

This tetraploid ($2n = 40$) is native to South America and has become widespread across warmer regions of southeastern states. In the Mississippi Valley north of Memphis it only occurs as a rare waif. There is only one known Ky. coll., made during 1985 by MM in a railroad yard of JEFF (KY). *P. urvillei* is one of the most robust species of the genus, often ca. 2 m tall and with 10-30 panicle branches.

ALI S.

3091--Echinochloa colona (L.) Link

Poaceae <Paniceae>: *Echinochloa colona*

This pantropical weed is widely scattered on damp sites in southern states; $2n = 54$.

ALI AS. **HAB** h-2,9? :: D 6. **ABU** +4.

3092--Echinochloa walteri (Pursh) Heller

Poaceae <Paniceae>: *Echinochloa walteri* (*muricata* var. w.)

This diploid ($2n = 36$) is largely concentrated in coastal regions of southeastern states and near the Great Lakes (FNA 25). Occasional inland records probably result from dispersal by migrating waterfowl. The few records from Ky. deserve more confirmation: Kearney (1893) from BELL or HARL; Gunn (1968) from BULL; A. Cusick (pers. comm.) from GALL.

HAB h-2,9 :: D 6. **ABU** g9? s4? -3?

3093--Echinochloa muricata (Beauv.) Fern. var. muricata

Poaceae <Paniceae>: *Echinochloa muricata* var. mu. (*pungens*)

This native species is widespread on wet soil in temperate regions of North America. It has often been misidentified as the Eurasian *crus-gallii*, which has a higher chromosome number ($2n = 56$ versus 36). In *muricata*, the stout papillose-based hairs of spikelets have often been considered diagnostic, but a more reliable difference (FNA 25) may be the acute to acuminate apices of upper (fertile, coriaceous) lemmas, which pass directly into the tip (versus rounded to broadly acute apices with a more distinct, early-withering, hairier tip). Hybrids have not been demonstrated; but see note under *muricata* var. *microstachya*.

HAB h-9,2 :: D 6. **ABU** g10 s10 +1?

3094--Echinochloa muricata (Beauv.) Fern. var. microstachya Wieg.

Poaceae <Paniceae>: *Echinochloa muricata* var. *microstachya* (*wiegandii*)

This western segregate of *muricata* usually has shorter spikelets (2.5-3.8 mm versus 3.5-5 mm), and shorter awns on lower lemmas (0-10 mm versus 6-16 mm). Some plants formerly named var. *wiegandii* Fassett or *E. occidentalis* (Wieg.) Rydb. are provisionally included here (FNA 25). They may be distinguished by spikelets with relatively short hairs, often not clearly pustular-based (F), and have been confused with *crus-galli*; it seems possible that some intergradation occurs.

HAB 2 :: D 6. **ABU** g10 s4? -3?

3095--Echinochloa crus-galli (L.) Beauv.

Poaceae <Paniceae>: *Echinochloa crus-galli* (var. c.)

This widespread weed of temperate regions has probably been present in Ky. since early after settlement. Anderson (1924) reported that there was an old coll. at KY before the fire of 1948: R. Peter, 1833, Lexington. Awn length is highly variable, even within plants.

ALI EU. HAB H-9,10,4 ::: D 6. ABU +6.

3096--Echinochloa frumentacea Link C

Poaceae <Paniceae>: Echinochloa frumentacea (crus-galli var. f.)
This robust small-grain ("white millet") is an ancient domesticate from Southern Asia or Africa, and is closely related to crus-galli (FNA 25). It is often used in bird-seed, and colls. from Ky. may represent occasional waifs after cultivation, rather than truly naturalized populations.

A closely related cultivar with darker spikelets and more bristly rachises is sometimes treated as a distinct species, *E. esculenta* (A. Braun) H. Scholtz ("Japanese millet"); 2n = 54 versus 36. That plant is also sown for wildlife in southern states (FNA 25), but there is no known naturalization in Ky.
ALI AS.

3097--Setaria viridis (L.) Beauv. var. viridis

Poaceae <Paniceae>: Setaria [Pennisetum] viridis var. v.
This is a widespread diploid weed in temperate regions; 2n = 18 (FNA 25). It was first reported from Ky. by Pr in 1893, but omitted by Gm in 1900-1914. Anderson (1947) noted: "fairly common, but reported [with colls.] from only two localities."

ALI EU. HAB H-10,12 ::+ D 6. ABU +6.

3098--Setaria viridis (L.) Beauv. var. major (Gaudin) Pospichal

Poaceae <Paniceae>: Setaria [Pennisetum] viridis var. major (robustapurpurea)
This robust variety is a relatively aggressive weed in corn and bean fields, especially in the midwest, where it often rivals faberi. It was unknown in Ky. until colls. of P. Haragan and others during 1980-2000 (KY, EKY). Var. robusta-purpurea Schreib. differs only in the purplish coloration of its spikes, and is not segregated here.

ALI EU. HAB H-10 ::: D 6. ABU +4.

3099--Setaria faberi Herrm.

Poaceae <Paniceae>: Setaria [Pennisetum] faberi
This is an abundant troublesome weed of cropped land in east-central states, especially in corn on fertile soils; 2n = 36 (FNA 25). It was unknown in Ky. until recorded by Beckett (1956).

ALI AS. HAB H-10 ::: D 6. ABU +6.

3100--Setaria italica (L.) Beauv. C

Poaceae <Paniceae>: Setaria [Pennisetum] italica
This "foxtail millet" is an ancient cultivar; 2n = 18 (Cr, FNA 25). It may have been artificially selected from viridis to produce large numbers of relatively large disarticulating seeds. *S. italica* is often cultivated for wildlife or livestock and can occasionally escape, but it may not be truly naturalized in the state. Colls. that are probably persistent from plantings are excluded.
ALI EU.

3101--Setaria verticillata (L.) Beauv.

Poaceae <Paniceae>: Setaria [Pennisetum] verticillata
This variable weed is widespread across northern and western states but rare to absent in the southeast; 2n = 18 to 108 (FNA 25). It is easily confused with viridis, but has distinctly tapering spikes and retrorsely scabrous bristles. In Ky. the only verified colls. may be from FAYE and WOOD (mostly at KY-Agr. Sch.). In 1914 Gm noted: "frequent in cultivated ground, but not so often seen as [*S. pumila*]." Anderson (1924) listed colls. dated 1833 to 1919, only from Lexington (FAYE).

ALI EU. HAB H-10 ::: D 6. ABU +4<

3102--Setaria pumila (Poir.) Roemer & J.A. Schultes

Poaceae <Paniceae>: Setaria [Pennisetum] pumila (glauca, lutescens)
This annual is a widespread weed in temperate regions; 2n = 36 and 72 (FNA 25). It has probably been present in Ky. since early after settlement (McMurtrie 1819, Short & Peter 1835). In early accounts it was misleadingly named *Panicum glaucum*, which is a synonym of *Pennisetum glaucum* (M). In 1914 Gm noted: "A common weed in all fields and elsewhere."

ALI EU. HAB H-10,12 ::: D 6. ABU +6.

3103--Setaria parviflora (Poir.) Kerguelén

Poaceae <Paniceae>: Setaria [Pennisetum] parviflora (geniculata)
This widespread southern species is the only perennial *Setaria* in Ky., and the only native member of the genus; 2n = 36 and 72 (FNA 25). Some colls. without roots are difficult to distinguish from *pumila*, and should be rechecked. In addition to its short knotty rhizomes (versus annual roots), *parviflora* differs from *pumila* in its usually shorter spikelets (2-2.8 mm versus 3-3.4 mm), its frequently shorter spikes (up to 8 cm versus 15 cm), usually without strong yellowish bristles (as in typical *pumila*), and its frequently glaucous leaves (versus usually plain green).

ALI s. HAB f-10,9,6 ::? D 5. ABU g10 s9 +3?

3104--*Pennisetum glaucum* (L.) R. Br. W

Poaceae <Paniceae>: *Pennisetum glaucum* (americanum)

This is an ancient diploid cultivar ("pearl millet"); $2n = 14$ (FNA 25). It is widely grown across North America for grain, birdseed and forage, but it is probably not truly naturalized except in the deep south (W). There is a coll. from Ky. associated with plantings in MCRA (R. Athey #2631 at EKY).

ALI AS.

3105--*Cenchrus spinifex* Cav. T

Poaceae <Paniceae>: *Cenchrus spinifex* (incertus, pauciflorus)

This ranges widely from southern states to South America. It is close to the more northern longispinus, and there has been confusion in nomenclature, with inconsistent mappings among states (FNA 25, K); $2n = 34$ usually in both species. It has not been verified in Ky., but reported distributions suggest that it may well occur along the Mississippi River (F, Gl, FNA 25, K). Further collection and revision is needed. *C. spinifex* differs from longispinus in having shorter spikelets (usually 3.5-5.9 mm versus 5.8-7.8 mm), with fewer bristles overall (8-43 versus 45-75), wider inner bristles (usually 1-3 mm at base versus 0.5-0.9 mm), and outer bristles that are usually flattened rather than usually terete.

3106--*Cenchrus longispinus* (Hack.) Fern.

Poaceae <Paniceae>: *Cenchrus longispinus* (carolinianus, "pauciflorus")

This ranges widely across temperate regions of North America, and perhaps further south (FNA 25). However, it is largely restricted to seasonally dry sandy soils, and most common in arid western regions. In Ky. most records are from western regions along major rivers, but a few disjunct records are from eastern regions on sandy riverbanks. See also notes under spinifex, which has been confused with longispinus.

HAB r-1,10 ::: C 6. **ABU** g10 s8 -2.

3107--*Andropogon gerardii* Vitman

Poaceae <Andropogoneae>: *Andropogon gerardii* (furcatus)

This range across most of eastern and central North America. It is widely scattered across most of Ky., and was formerly dominant in some native grasslands. However, in the Bluegrass region it is known only from a few low rocky ledges along the Kentucky Rv. and a few peripheral sites in transitions to the Knobs. It is also rare to absent in most Appalachian regions, except locally in the southern Cumberland Plateau and in some western transitions.

A. gerardii varies greatly across its range, and further study is need; $2n = 20$ to 90 (FNA 25). In Ky. it occurs in diverse and often disjunct habitats: rocky glades, deeper soils, and riverbanks on diverse substrates. Plants along banks of the Big South Fork (in Ky. and Tenn.) and along the Obed Rv. (in Tenn.) tend to have just two branches in inflorescences (versus 3) and their leaves lack hairs, even at lower sheath summits (D. Estes, pers. comm.). However, no definitive analysis of these trends has been undertaken.

HAB f-10,12,1 C 5. **ABU** g10 s8 -4.

3108--*Andropogon virginicus* L. var. virginicus

Poaceae <Andropogoneae>: *Andropogon* <Leptopogon> *virginicus* var. v.

This is widespread across southeastern states, north to the southern Great Lakes, and south to Central America. It is especially common in old fields on nutrient-depleted soils (FNA 25). Variation needs further study, but only diploids ($2n = 20$) have been reported. Records mapped here include plants that have been referred to var. *tetrastachys* (Ell.) Hack., using older treatments (Hitchcock & Chase 1950), but that segregate is not recognized in recent treatments. Also, some intergradation with *glomeratus* is expected (FNA 25).

HAB F-10,9 C 5. **ABU** g10 s10 +1?

3109--*Andropogon virginicus* L. var. decipiens C. Campbell

Poaceae <Andropogoneae>: *Andropogon* <Leptopogon> *virginicus* var. *decipiens*

This occurs mostly on the southeastern Coastal Plain (FNA 25), where it largely replaces typical *virginicus* in some areas, but it has often been overlooked. Its inflorescence differs in having slender sheaths (ca. 2.4-3.1 mm wide versus ca. 3.3-4.4), typically with only 2 branches (versus 2-5), which are often exerted on relatively long peduncles. A dense population occurs in PULA (JC for KY) at the Hazel Dell meadow, and probably at other seasonally dry sites in warmer regions of the state. Further revision of *virginicus* is needed across the state. Var. *decipiens* can also be casually confused with *Schizachyrium scoparium*.

HAB 9 B 5. **ABU** g9? s2? -3?

3110--*Andropogon glomeratus* (Walt.) B.S.P. var. hirsutior (Hack.) C. Mohr

Poaceae <Andropogoneae>: *Andropogon* <Leptopogon> *glomeratus* var. *hirsutior* (*virginicus* var. h.)

This occurs mostly on wet acid soils of the southeastern Coastal Plain, east of the Mississippi, and is generally absent in Appalachian regions (FNA 25, W). It differs from typical *glomeratus* in its more elongated inflorescence (not obpyramidal), with shorter peduncles (mostly 2-5 cm versus 10-35 cm); see FNA 25 for details. In Ky. two colls. from LAUR are clearly referable to this taxon. Other colls. should be searched for under *glomeratus* and *virginicus*. Var. *hirsutior* has been treated under both species and appears to be intermediate, but W and others have suggested it is a distinct species.
HAB f-9,10 C 5. **ABU** g9 s8 -2?

3111--*Andropogon glomeratus* (Walt.) B.S.P. var. *glomeratus*

Poaceae <Andropogoneae>: *Andropogon* <Leptopogon> *glomeratus* var. g. (*virginicus* var. *abbreviatus*)

This occurs on wet acid soils of the southeastern Coastal Plain, east of the Mississippi, and it also extends north to Pa. in Appalachian regions (FNA 25, W). There has been confusion in Ky. and elsewhere with other taxa, including plants known as var. *hirsutior* (see notes under that name) and var. *pumilus* (Vasey) L.H. Dewey. Both of those taxa may deserve species status (W). Only diploids have been reported in the *glomeratus* complex ($2n = 20$), and intermediates between the segregates can be expected.

Var. *pumilus* (= *A. tenuispathus* Nash) is widespread on more base-rich soils from Central America to southeastern states, and can be expected in w. Ky. It usually has distinctly narrower raceme sheaths (mostly 2-2.5 mm versus 2.4-3.4 mm), shorter ligules (averaging 0.8 mm versus 1.2 mm) with longer cilia (0.2-0.9 mm versus 0-0.3 mm), and more scabrous glumes (W).

HAB 9 C 5. **ABU** g9 s4? -2?

3112--*Andropogon gyrans* Ashe

Poaceae <Andropogoneae>: *Andropogon* <Leptopogon> *gyrans* ("elliottii")
This occurs from Central America to southeastern states, north into much of the Ohio Valley. It tends to grow on drier sites than *virginicus*, generally with less intense agricultural history, but the two species are often intermixed. The valid name may still be *A. elliotii* Chapman, according to Ward (2004b; W).

HAB f-10,12 C 5. **ABU** g9 s8 -4.

3113--*Andropogon ternarius* Michx.

Poaceae <Andropogoneae>: *Andropogon* <Leptopogon> *ternarius*
This southeastern species is largely restricted to dry acid soils; $2n = 40$ and 60 (FNA 25). In Ky. it is locally abundant but known only on the southern

Cumberland Plateau, on the central Mississippian Plateaus, and on the Coastal Plain plus adjacent gravelly or cherty hills. It is unknown in the Ohio Valley upstream of these regions.

HAB f-10,12 B 5. **ABU** g9 s8 -3.

3114--*Schizachyrium scoparium* (Michx.) Nash var. *divergens* (Hack.) Gould R

Poaceae <Andropogoneae>: *Schizachyrium* [*Andropogon*] *scoparium* var. *divergens*

This occurs mostly in piney woodlands of the lower Mississippi Valley and Gulf Coast, north to Ark. and Miss. but no further according to FNA 25 (unlike PL). It appears to intergrade with var. *scoparium*, especially in Miss. Var. *divergens* is distinguished by having more developed staminate pedicellate spikelets, and usually more hairy foliage (FNA 25). It has been reported from Ky. by B, Cr and others, presumably based on B's colls. from CHRI and GRAY (check US). However, verification is needed using modern treatment.

3115--*Schizachyrium scoparium* (Michx.) Nash

Poaceae <Andropogoneae>: *Schizachyrium* [*Andropogon*] *scoparium* (var. s.)

This is widespread across eastern and central North America, especially in remnants of native grassland on dry soils. In Ky. it is uncommon to virtually absent in regions that were largely forested before settlement. Although highly variable across its range, only tetraploids ($2n = 40$) have been reported (FNA 25). It occupies diverse and often disjunct habitats within Ky., including rocky glades, deeper soils, and riverbanks on different substrates. Glaucous plants are widely scattered, and may be relatively common on rocky riverbanks.

HAB f-12,10 C 5. **ABU** g9 s9 -4.

3116--*Bothriochloa laguroides* (DC.) Herter ssp. *torreyana* (Steud.) Allred & Gould

Poaceae <Andropogoneae>: *Bothriochloa* [*Andropogon*] *laguroides* ssp. *torreyana* ("saccharoides")

This hexaploid ($2n = 60$) is native to the southern Great Plains and arid southwestern regions of North America. During the past 30 years, it has spread through much of the lower Mississippi Valley along roads, especially interstate highways. It is much more widespread in Ky. than indicated by the colls. mapped here. Typical *B. laguroides* and *B. saccharoides* (Sw.) Rydb. are more southern taxon in Central and South America (FNA 25). However, the

name "saccharoides" (or "silver beardgrass") has been often misapplied to *laguroides* ssp. *torreyana*.

ALI W. **HAB** R-10 E? 5. **ABU** +5.

3117--*Ripidium ravennae* (L.) Tr. C

Poaceae <Andropogoneae>: *Ripidium* [*Saccharum**] *ravennae*
This Mediterranean species has been cultivated as an ornamental ("ravenna grass") for over 100 years in Ky. (Gm). There is a recent coll. from a roadside in CAMP (EKY, KNK), but no evidence of naturalization in the state. *R. ravennae* has also been placed in *Erianthus* or *Saccharum*, and generic assignment remains controversial; $2n = 20$ (FNA 25, W).

ALI EU.

3118--*Erianthus giganteus* (Walt.) Beauv.

Poaceae <Andropogoneae>: *Erianthus* [*Saccharum**] *giganteus*
This variable species is widespread from Central America to southeastern species, usually growing on seasonally wet sites; $2n = 30, 60, 90$ (FNA 25). The coll. mapped here from PULA (KY) may be atypical in its narrow spike, dark shiny seeds, and rather short basal hairs in the spikelets. This coll. has been named *E. contortus* Ell. (*S. brevibarbe* var. *c.*), but *giganteus* remains the better identification.

Generic assignment of the four species here treated in *Erianthus* has been controversial; they may become included in *Miscanthidium* Stapf. (W).

HAB f-9,6,10 B 5. **ABU** g8 s8 -4.

3119--*Erianthus strictus* Ell. R

Poaceae <Andropogoneae>: *Erianthus* [*Saccharum**] *strictus* (*S. baldwinii*)
This diploid ($2n = 30$) occurs mostly on the southeastern Coastal Plain. There are no confirmed records of *strictus* from Ky., but it is known from adjacent counties in se. Mo. and w. Tenn. There is a coll. by J.L. Gentry (KY) that may come from the state, but the label is missing.

3120--*Erianthus contortus* Ell. T

Poaceae <Andropogoneae>: *Erianthus* [*Saccharum**] *contortus* (*S. brevibarbe* var. *c.*)
This tetraploid ($2n = 60$) occurs mostly on the southeastern Coastal Plain. There are a few reports from Ky., but verified colls. have not been located or confirmed; see notes under *giganteus* and *alopecuroides*.

3121--*Erianthus alopecuroides* (L.) Ell.

Poaceae <Andropogoneae>: *Erianthus* [*Saccharum**] *alopecuroides* (*divaricatus*)

This diploid ($2n = 30$) is widespread across southeastern states on submesic sites with acid soils, especially at woodland edges. A coll. from BELL (T.H. Kearney #385 at US; formerly at KY) was initially misidentified as *E. contortus* Ell. (see also: Anderson 1924), which remains unknown in the state.

HAB f-8,10 B 4. **ABU** g9 s9 -3.

3122--*Microstegium vimineum* (Trin.) A. Camus

Poaceae <Andropogoneae>: *Microstegium* [*Eulalia*] *viminea*
This alien annual has become a serious invasive problem of woodlands in east-central states. It was first recorded in Ky. during the 1930s (B), and by the 1980s it had become widespread across most of the state. It is especially abundant on damp medium-acid soils that have been exposed along floodplains or trails. It is generally avoided by herbivores, and often associated with cattle or high deer populations.

ALI AS. **HAB** g-4,7,9,5 :: C 3. **ABU** +6*.

3123--*Miscanthus sinensis* Anderss.

Poaceae <Andropogoneae>: *Miscanthus sinensis*
This widely planted ornamental has become naturalized across east-central states, especially in mid-Atlantic and Appalachian regions (FNA 25). It was first recorded in Ky. during the 1930s by B. It is now abundant in some Appalachian regions and locally elsewhere, especially in brushy old fields and roadsides. See also notes under *floridulus*, which may be confused.

The sterile triploid cultivar known as *M. X giganteus* Greef & Deu is probably derived from *M. sinensis* and *M. sacchariflorus* (Maxim.) Franch (Linde-Laursen 2004). It is the subject of much research on potential use for biofuel at the Univ. of Ky. and elsewhere (J. Chappell, pers. comm.), but a fungal leaf blight has caused serious problems in Ky. (Ahonsi et al. 2010).

ALI AS. **HAB** f-10,8 C 5. **ABU** +5*.

3124--*Miscanthus floridulus* (Labill.) Warb. ex K. Schum. & Laut. T

Poaceae <Andropogoneae>: *Miscanthus floridulus*
This is an even more robust plant than *sinensis*, with wider blades and longer rachises, but smaller spikelets; $2n = 38$ typically in both species (FNA 25). *M. floridulus* is an ornamental that has not been widely reported as naturalized in North America, but colls. filed under *sinensis* should be rechecked. Some

colls. mapped here as *sinensis* (e.g. from JOHN at MDKY) may be at least transitional to *floridulus*. But in Mo., plants previously referred to *floridulus* (St) are now considered closer to *sinensis* (Y).

ALI AS. HAB f-8,10 C 5.

3125--*Sorghum halepense* (L.) Pers.

Poaceae <Andropogoneae>: *Sorghum halepense*

This weed from the Mediterranean region is widespread in subtropical to mid-temperate regions of North America. It was first reported from Ky. in 1893 (Pr). In 1914 Gm noted: "not as common in Kentucky as it is farther south, but is likely to be encountered anywhere in small quantities... Its known value as a forage plant is decidedly in its favor..." It has become abundant locally along roads and in farmland that is not regularly mowed or grazed.

ALI EU. HAB F-10,8,6 D 5. **ABU** +6*.

3126--*Sorghum bicolor* (L.) Moench

Poaceae <Andropogoneae>: *Sorghum bicolor* (vulgare)

Typical ssp. *bicolor* is the common small grain crop of subtropical and temperate regions that is known as "sorghum" or "milo"; there are several cultivars. More weedy plants known as ssp. *drummondii* (Steud.) de Wet (= *S. sudanense* (Piper) Stapf.) or "shattercane" may be derived from hybrids between ssp. *bicolor* and the original wild progenitor, ssp. *arundinaceus* (Desv.) de Wet. (FNA 25). Ssp. *drummondii* is common in corn crops, and probably includes most of the colls. mapped here. However, there is much interbreeding between these taxa and further study is needed.

ALI AF. HAB H-10,8 :: D 6. **ABU** +5.

3127--*Sorghastrum nutans* (L.) Nash

Poaceae <Andropogoneae>: *Sorghastrum nutans*

This is a widespread variable species in central and eastern North America; $2n = 20, 40, 80$ (FNA 25). In Ky. it is locally common in remnants of native grassland, but has also spread locally into old fields and rights-of-way. It has become widely sown for wildlife and revegetation in recent decades; such plantings are excluded here, but will become more difficult to distinguish from native plants in the future. *Sorghastrum* is generally not native in the Bluegrass region, except for scattered plants along low rocky banks of the Kentucky Rv. and in some transitions to surrounding hills and valleys.

HAB f-10,8,12 C 5. **ABU** g10 s9 -4.

3128--*Arthraxon hispidus* (Thunb.) Makino

Poaceae <Andropogoneae>: *Arthraxon hispidus*

This Japanese species has increased rapidly across southeastern states during recent decades. In Ky. the first colls. were made ca. 1980 (Woods 1983; M). It is now widely scattered and locally abundant on seasonally damp medium-acid soils in open disturbed areas. Dispersal may often occur on tires of vehicles; JC has observed patches in parking lots and dirt-road beds of the Bluegrass region (CLAR, HARR). However, the species does not seem to be increasing much within this region, perhaps due to the heavy calcareous soils and competition from other species.

ALI AS. HAB f-9,6,4 ::? C 4. **ABU** +5*.

3129--*Coix lacryma-jobi* C

Poaceae <Andropogoneae>: *Coix lacryma-jobi*

This tall maize-like grass ("Job's Tears") is often cultivated for ornamental or other uses; $2n = 20$ (FNA 25). Plants sometimes establish from seed scattered away from gardens, but they are not independently naturalized. There are colls. from CAMP and MADI (Miami Univ., Ohio).

ALI AS.

3130--*Zea mays* L. C

Poaceae <Andropogoneae>: *Zea mays*

This crop (corn, maize) is a widely grown in humid temperate regions; $2n = 20$. Plants sometimes establish from seed scattered away from fields, but it is not independently naturalized.

ALI S.

3131--*Tripsacum dactyloides* (L.) L.

Poaceae <Andropogoneae>: *Tripsacum dactyloides* (var. d.)

This was formerly common in low grasslands from Central America to southeastern states. There is much regional variation (Newell & de Wet 1974, FNA 25); $2n = 36, 54$ and 72 , with 72 more frequent to the east (? = var. *dactyloides*). In Ky. this species is generally rare but locally abundant in grassland remnants, especially to the west. There are also scattered records from rocky river banks in Appalachian regions, including the Cumberland River near the Falls (MCRE & WHIT); along the Ohio Rv. in s. Ohio (PL; D. Boone, pers. comm.); and along the New Rv. in W. Va.

The old name "beargrass" may have been applied to this unusually robust grass during the pioneer era, as at the mouth of Beargrass Creek above the Falls of Ohio Rv. (JEFF), and on "Beargrass River" that was later named

Powell Rv. in se. Va. (T. Walker's journal of 1750). Short (1840) was told that "beargrass... grows abundantly on the Cumberland Mountains in the s.e. corner of Kentucky." Although unknown on those uplands today, patches of *Tripsacum* are known further south in Tenn. (Fentress Co. in Ch), suggesting former grassy openings across the Cumberland Plateau.

This grass is highly palatable, and livestock may have eradicated it from most of the former range. Short (1840) noted: "A luxuriant grass to which public attention was drawn a few years since, as an excellent example or provender; a character which further experience has proved it not to deserve. It occurs, as a native, among the grasses of the barrens; and has been introduced into different parts of the state."

HAB r-9,10,1 C 5. **ABU** g10 s7 -5.