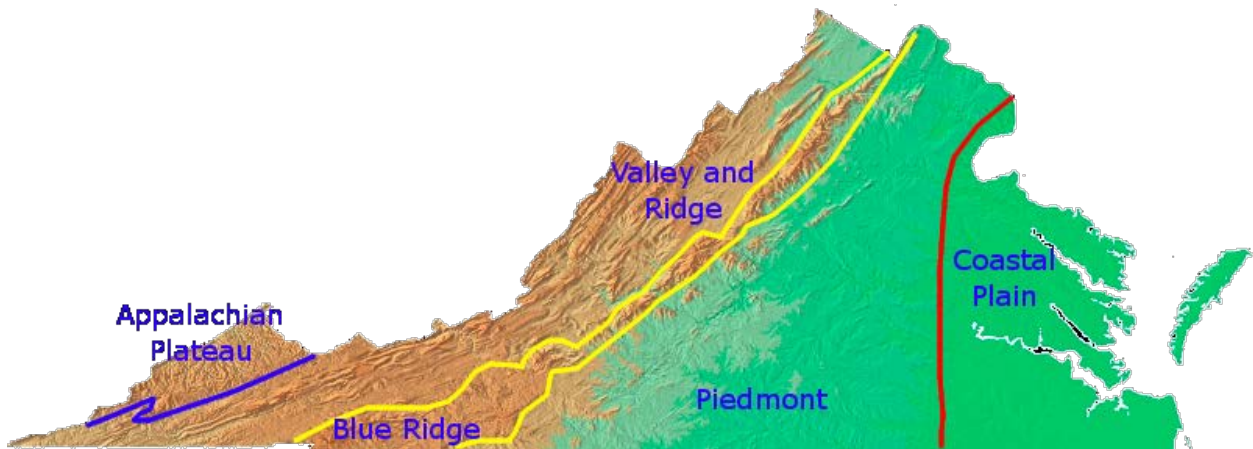


Solidago (Goldenrod) and *Euthamia* (Flat-top Goldenrod) of Virginia



Source: USGS Open-File Report 99-11.

Goldenrod species with a wide distribution in Virginia

***Solidago altissima* L. var. *altissima*.** TALL GOLDENROD. Hab: Fields, roadsides, disturbed areas. Dist: NS, QC, and SK south to n. GA, n. AL, n. MS, AR, and e. OK; introduced in w. North America. Phen: Aug-Oct. Tax: Semple (2022) reports tetraploid ($2n=36$) and hexaploid ($2n=54$) counts for this variety, with most of its broad distribution hexaploid, and smaller zones of distribution of tetraploids centered in the Interior Highlands of AR and OK, and the ne. edge of our region, in NJ and se. NY. Syn: = Il, K4, NY, Tx, Semple (2022), Semple et al (2015); < *Solidago altissima* L. – F, GW2, K1, Mi, Pa, RAB, Tn, WV, Johnson (1995); < *Solidago altissima* L. ssp. *altissima* – Ar, FNA20, K3, NE; < *Solidago altissima* L. var. *altissima* – Va; < *Solidago canadensis* L. – Oh3, W; < *Solidago canadensis* L. var. *scabra* Torr. & Gray – C, G, GrPI, NcTx, SE1, WH3; < *Solidago hirsutissima* Mill. – S.

***Solidago bicolor* L.** SILVERROD, WHITE GOLDENROD. Hab: Woodlands, roadbanks, pastures. Dist: NS and MB south to GA and MS. Phen: Jul-Oct. Syn: = C, FNA20, G, Il, K1, K3, K4, Mi, NE, NY, Oh3, Pa, RAB, S, SE1, Tn, Va, W, WV, Johnson (1995), LeBlond (2000), Semple et al (2017a); > *Solidago bicolor* L. var. *bicolor* – F; > *Solidago bicolor* L. var. *ovalis* – F.

***Solidago caesia* L.** BLUE-STEMMED GOLDENROD. Hab: Moist forested slopes. Dist: ME and ON south to n. FL and LA. Phen: Aug-Oct. Syn: = Semple & Beck (2021); = *Solidago caesia* L. var. *caesia* – Ar, FNA20, K3, K4, NE, NY, Va, Johnson (1995); < *Solidago caesia* L. – C, F, FI7, G, Il, K1, Mi, Oh3, Pa, RAB, S, SE1, Tn, Tx, W, WH3, WV.

Solidago erecta Banks ex Pursh. ERECT GOLDENROD. Hab: Woodlands, old fields, woodland borders, grassy balds. Dist: NY and CT south to GA, AL, and MS. Phen: Aug-Oct. Syn: = C, F, G, K1, K3, NE, Oh3, Pa, RAB, S, SE1, Tn, Va, W, WV, Semple et al (2017a); = *Solidago speciosa* Nutt. var. *erecta* (Banks ex Pursh) MacMill. – Johnson (1995); < *Solidago erecta* Banks ex Pursh – FNA20, (also see *S. porteri*).

Solidago gigantea Aiton. SMOOTH GOLDENROD. Hab: Old fields, roadsides, streamside meadows, bottomlands. Dist: NS west to SK and MT, south to Panhandle FL (Liberty County), TX, and CO. Phen: Aug-Sep (-Oct). Syn: = Ar, C, FI7, FNA20, GrPI, GW2, Il, K1, K3, K4, Mi, Mo2, NcTx, NE, NY, RAB, Tn, Tx, Va, W, WH3, Martino, Semple, & Beck (2020); = *Solidago serotina* Aiton – S; > *Solidago gigantea* Aiton var. *gigantea* – F, G, Oh3, Pa, SE1, WV, Johnson (1995); > *Solidago gigantea* Aiton var. *leiophylla* Fernald – F, Oh3, WV; > *Solidago gigantea* Aiton var. *serotina* (Kuntze) Cronquist – G, Pa, SE1, Johnson (1995); > *Solidago serotinoides* Á. Löve & D. Löve; > *Solidago shinnersii* (Beaudry) Beaudry.

Solidago juncea Aiton. EARLY GOLDENROD. Hab: Meadows, pastures, roadbanks, woodland borders. Dist: NS west to MN, south to GA, AL, MS, and n. LA. Phen: Jul-Oct. Syn: = Ar, C, FNA20, Il, K3, K4, Mi, Mo2, NE, NY, Oh3, Pa, RAB, S, SE1, Tn, Va, W, WV, Johnson (1995); > *Solidago juncea* Aiton var. *juncea* – F, G, K1; > *Solidago juncea* Aiton var. *neobohemica* Fernald – F, K1; > *Solidago juncea* Aiton var. *ramosa* Porter & Britton – G.

Solidago nemoralis Aiton var. ***nemoralis***. GRAY GOLDENROD. Hab: Woodlands, glades, barrens, roadbanks. Dist: NS west to ND, south to Panhandle FL and TX. Phen: Jun-Nov. Syn: = K1, K3, NcTx, Oh3, Tx, Va; = *Solidago nemoralis* Aiton – Il, Mi; = *Solidago nemoralis* Aiton ssp. *nemoralis* – Ar, FNA20, NE, NY, Semple, Kornobis, & Bzovsky (2018); < *Solidago nemoralis* Aiton – FI7, Pa, RAB, S, Tn, W, WH3, Johnson (1995); > *Solidago nemoralis* Aiton var. *haleana* Fernald – C, F, G, SE1, WV; > *Solidago nemoralis* Aiton var. *nemoralis* – C, F, G, SE1, WV.

Solidago odora Aiton. SWEET GOLDENROD. Hab: Dry forests and woodlands, especially in dry pinelands, such as sandhills, of the Coastal Plain, inland in dry, fire-maintained sites, such as glades, barrens, and ridgetop pine-oak woodlands. Dist: NH, VT, NY, OH, and MO south to FL and TX. Phen: Jul-Oct. Syn: = F, G, NcTx, NY, Oh3, Pa, RAB, S, Tn, Tx, Va, W, WV, Johnson (1995), Semple, Bzovsky, & Tong (2016); = *Solidago odora* Aiton ssp. *odora* – Ar, FNA20, NE; = *Solidago odora* Aiton var. *odora* – C, FI7, K1, K3, K4, Mo2, WH3.

Solidago puberula Nutt. DOWNY GOLDENROD. Hab: Bogs, wet meadows, and wet pastures, in dry acid soils in VA and WV. Dist: NS west to ON, south to GA, nw. AL, and TN. Phen: Aug-Oct. Syn: = NY, S, Tn, LeBlond (2000); = *Solidago puberula* Nutt. ssp. *puberula* – FNA20; = *Solidago puberula* Nutt. var. *puberula* – C, F, G, K1, K3, K4, NE, RAB, SE1, Va, Johnson (1995); < *Solidago puberula* Nutt. – Pa, W, WV.

Solidago rugosa Mill. var. ***aspera*** (Aiton) Fernald. ROUGH-STEMMED GOLDENROD. Hab: Fields, forests, roadsides. Dist: ME west to MI, south to FL and TX. Phen: Aug-Nov. Syn: = Mi, NcTx, NY, Oh3, Tn, WV, Sorrie (2018a) in Weakley et al (2018a); = *Solidago aspera* Aiton – Il; = *Solidago*

rugosa Mill. ssp. *aspera* (Aiton) Cronquist var. *aspera* – Ar, FNA20, K3, K4, NE, Pa; < *Solidago altissima* L. – S, misapplied; < *Solidago rugosa* Mill. – GW2, Va; < *Solidago rugosa* Mill. ssp. *aspera* (Aiton) Cronquist – C, G, K1, SE1, W; < *Solidago rugosa* Mill. var. *aspera* (Aiton) Fernald – F, FI7, WH3; < *Solidago rugosa* Mill. var. *rugosa* – RAB.

***Solidago rugosa* Mill. var. *rugosa*.** ROUGH-STEMMED GOLDENROD. Hab: Fields, forests, wetlands. Dist: NS west to ON, south to GA, AL, MS, LA, TX. Phen: Aug-Oct. Syn: = Mi, NcTx, NY, Oh3; = *Solidago rugosa* Mill. – Il; = *Solidago rugosa* Mill. ssp. *rugosa* – K4, NE; = *Solidago rugosa* Mill. ssp. *rugosa* var. *rugosa* – Ar, C, FNA20, G, K3, Pa, SE1; < *Solidago rugosa* Mill. – GW2, Va; < *Solidago rugosa* Mill. ssp. *rugosa* – W; > *Solidago rugosa* Mill. ssp. *rugosa* var. *rugosa* – K1; > *Solidago rugosa* Mill. ssp. *rugosa* var. *villosa* – C, G, K1, SE1, Johnson (1995); < *Solidago rugosa* Mill. var. *rugosa* – RAB; > *Solidago rugosa* Mill. var. *rugosa* – F, WV, Sorrie (2018a) in Weakley et al (2018a); > *Solidago rugosa* Mill. var. *villosa* – F, WV, Sorrie (2018a) in Weakley et al (2018a).

***Solidago speciosa* Nutt.** SHOWY GOLDENROD. Hab: Pastures, forests, woodlands, roadbanks. Dist: NH, VT, NY, and WI south to GA, MS, LA, and OK. Phen: Aug-Oct. Tax: Probably better accorded species rank separate from *S. rigidiuscula*, following Semple et al. (2012). Syn: = Il, NY, Semple et al (2012), Semple, Tong, & Chong (2017a); = *Solidago speciosa* Nutt. ssp. *speciosa* var. *speciosa* – Ar, FNA20; = *Solidago speciosa* Nutt. var. *speciosa* – C, F, G, GrPl, K1, K3, K4, Mo2, NE, Oh3, SE1, Tn, Va, Johnson (1995); > *Solidago conferta* – S; > *Solidago harperi* Mack. in Small – S; < *Solidago speciosa* Nutt. – Pa, RAB, W, WV.

***Solidago uliginosa* Nutt. var. *uliginosa*.** BOG GOLDENROD. Hab: Bogs, wet meadows, mafic fens, acidic seepage swamps. Dist: ME, ON, MI and WI south to e. VA, w. NC, ne. TN, s. IN, and c. IL (reports from farther south are dubious and need additional evaluation; most southern material formerly identified as *S. uliginosa* is actually *S. simulans* or *S. gracillima*). Phen: Jul-Sep. Tax: Var. *uliginosa* is primarily tetraploid, and has a more southern distribution than var. *peracuta* (Semple et al. 2019b). Syn: = F, G, Il, K1, Va, WV, Semple et al (2019b); < *Solidago uliginosa* Nutt. – C, FNA20, K3, Mi, NE, NY, Oh3, Pa, RAB, SE1, W, Johnson (1995); < *Solidago uliginosa* Nutt. var. *uliginosa* – K4; < *Solidago uniligulata* (DC.) Porter – S.

***Solidago ulmifolia* Muhl. ex Willd.** ELMLEAF GOLDENROD. Hab: Rocky forests and woodlands, especially on mafic and calcareous substrates, moist hammocks (in FL). Dist: NS, ME, ON, and MN, south to FL and TX. Phen: Aug-Oct. Tax: Beck et al. (2021) studied the recognition of var. *palmeri* and var. *ulmifolia* and did not find a basis for recognition of two varieties; a controversial decision. Syn: = F, FI7, Il, Mi, Pa, RAB, S, Tn, Va, W, WH3, WV; > *Solidago ulmifolia* Muhl. ex Willd. var. *palmeri* Cronquist – Ar, FNA20, G, K1, K3, K4, SE1; > *Solidago ulmifolia* Muhl. ex Willd. var. *ulmifolia* – Ar, C, FNA20, G, GrPl, K1, K3, K4, NE, SE1.

Goldenrod species with a primary range in the Coastal Plain
(*E. caroliniana* infrequent in the outer Piedmont)

Solidago fistulosa Mill. PINE BARREN GOLDENROD. Hab: Pocosins, swamp forests, wet pine savannas, wet pine flatwoods, maritime forests. Dist: NJ south to s. FL, west to LA. Phen: Aug-Nov. Syn: = C, F, FI7, FNA20, G, GW2, K1, K3, K4, RAB, S, SE1, Va, WH3, Johnson (1995), Semple, Bzovsky, & Tong (2016).

Solidago latissimifolia Mill. ELLIOTT'S GOLDENROD. Hab: Pocosins, swamp forests, sandhill seepages, sandhill-pocosin ecotones. Dist: NS south c. peninsular FL, west to Panhandle FL. Phen: Aug-Oct. Syn: = FI7, FNA20, K1, K3, K4, NE, NY, Va, WH3, Johnson (1995), Weakley et al (2018a); = *Solidago elliotii* Torr. & A.Gray – C, G, GW2, RAB, S, SE1; > *Solidago elliotii* Torr. & A. Gray var. *ascendens* Fernald – F; > *Solidago elliotii* Torr. & A. Gray var. *elliotii* – F; > *Solidago elliotii* Torr. & A. Gray var. *pedicellata* Fernald – F.

Solidago sempervirens L. NORTHERN SEASIDE GOLDENROD. Hab: Coastal dunes, dune slacks, maritime wet grasslands, tidal marshes. Dist: NL (Newfoundland) south to ne. NC along the coast (and introduced inland in saline situations such as along salted roadways); isolated more southern occurrences likely reflect introductions. Phen: Late Aug-Nov. Syn: = K4, NY, S, Semple et al (2016a); = *Solidago sempervirens* L. ssp. *sempervirens* – FNA20, Pa; = *Solidago sempervirens* L. var. *sempervirens* – C, F, G, IL, K1, NE, SE1, Va; < *Solidago sempervirens* L. – Mi, RAB; < *Solidago sempervirens* L. var. *sempervirens* – Johnson (1995).

Solidago stricta Aiton. PINE BARREN BOG GOLDENROD. Hab: Bogs and pine savannas. Dist: S. NJ south to e. NC. Syn: = K3, K4, Semple (2013), Semple et al (2016a), Semple et al (2016b); < *Solidago gracillima* Torr. & A. Gray – K1, RAB, SE1; > *Solidago perlonga* Fernald – F; < *Solidago sempervirens* L. var. *sempervirens* – Johnson (1995); < *Solidago stricta* Aiton – C, G; < *Solidago stricta* Aiton ssp. *gracillima* (Torr. & A. Gray) Semple – FNA20.

Solidago tarda Mack. SANDHILL GOLDENROD. Hab: Longleaf pine sandhills, other dry pinelands, xeric fluvial sand ridges, Piedmont barrens and rocky woodlands. Dist: NJ and e. PA south to e. VA, c. and s. GA, AL, and Panhandle FL; disjunct in Marion County, TN (Chester, Wofford, & Kral 1997). Phen: Sep-Oct. Syn: = C, FNA20, K3, K4, S, SE1, Tn, Va, Semple et al (2021); = n/a – Pa; < *Solidago arguta* Aiton – RAB, Johnson (1995); < *Solidago arguta* Aiton – K1; < *Solidago arguta* Aiton var. *caroliniana* A. Gray – WH3; < *Solidago ludoviciana* (A. Gray) Small – F.

Solidago tortifolia Elliott. TWISTED-LEAF GOLDENROD. Hab: Longleaf pine sandhills (especially in loamy flats and dips), sandy longleaf pine sandhills, other dry pinelands, calcareous clay prairies (Black Belt of AL and MS). Dist: Se. VA south to s. FL, west to AR and TX. Phen: Aug-Nov. Syn: = Ar, C, F, FI7, FNA20, G, K1, K3, K4, RAB, S, SE1, Tx, Va, WH3, Johnson (1995).

Euthamia caroliniana (L.) Greene ex Porter & Britt. SLENDER FLAT-TOP GOLDENROD. Hab: Dune grasslands and scrub, interdune swales and ponds, bogs, depression ponds, wet to fairly dry clearings, ditches, old fields, and roadsides.

Goldenrod species with a primary range in the Fall Zone (Potomac Gorge; also Shenandoah River in the case of *S. rupestris*)

Solidago racemosa Greene. STICKY GOLDENROD. Hab: Rocky, flood-scoured riversides. Dist: ME and QC south to n. VA and WV; plants in the Cumberland Plateau of KY and ne. TN (Churchill & Schell 1992; Chester, Wofford, & Kral 1997) previously attributed to *S. racemosa* appear to be a mix of true *S. racemosa* and a population perhaps best considered either as a disjunct and somewhat morphologically disparate part of the newly named *S. arenicola* or as a new taxon (Floden 2012). Phen: Aug-Sep. Syn: = K4, NY, Tn, Va, WV, Semple & Peirson (2013); = *Solidago simplex* Kunth ssp. *randii* (Porter) Ringius var. *racemosa* (Greene) Ringius – C, FNA20, K1, NE, Pa; = *Solidago spathulata* DC. ssp. *randii* (Porter) Cronquist var. *racemosa* (Greene) Cronquist – G, SE1; > *Solidago racemosa* Greene var. *racemosa* – F; < *Solidago simplex* Kunth – Johnson (1995); > *Solidago victorinii* – F.

Solidago rupestris Raf. RIVERBANK GOLDENROD, ROCK GOLDENROD. Hab: Crevices in rocky, flood-scoured riversides. Dist: PA, OH, and IL south to n. VA and TN. Phen: Jul-Sep. Syn: = C, F, FNA20, K1, K3, K4, SE1, Tn, Va, Johnson (1995); = n/a – Pa; = *Solidago canadensis* L. var. *rupestris* (Raf.) Porter – G, Oh3; < *Solidago altissima* L. – RAB; < *Solidago canadensis* L. – S.

Goldenrod species with a primary range in the Piedmont and Coastal Plain

Solidago pinetorum Small. PINEYWOODS GOLDENROD. Hab: Dry woodlands, woodland borders, roadbanks, dry pinelands. Dist: N. and wc. VA south through e., c., and nw. NC to nc. SC. Phen: Late Jun-Sep. Syn: = C, F, FNA20, G, K1, K3, K4, RAB, S, SE1, Va, W, Johnson (1995).

Euthamia graminifolia (L.) Nutt. **var. *nuttallii*** (Greene) W. Stone. HAIRY GRASS-LEAVED GOLDENROD. Hab: Moist to dry weedy situations, riverbanks, bottomlands, bog margins. Dist: NL (Newfoundland) and MB south to MD, c. VA, WV, w. NC, MI, WI, CO, and NM. Phen: Aug-Oct.

Goldenrod species with a primary range in the Piedmont

Solidago salicina Elliott. SOUTHERN ROUGH-LEAVED GOLDENROD. Hab: Streamhead pocosins, sandhill seepages, swamp edges, rarely inland in seepage over rock. Dist: Primarily Coastal Plain: se. VA south to Panhandle FL, west to se. OK and e. TX, and somewhat disjunct in the Ozarks and Ouachitas of MO and AR, also rarely reaching the lower Piedmont; disjunct in w. SC in the uppermost Piedmont in the Blue Ridge Escarpment region. Phen: Sep-Oct. Tax: Semple, Tong, & Pastolero (2012) have clarified the taxonomy, distribution, and nomenclature of this and *S. patula*. Syn: = K3, K4, S, Tx, Semple et al (2021), Semple, Tong, & Pastolero (2012); = *Solidago patula* Muhl. ex Willd. ssp. *strictula* (Torr. & A. Gray) Semple – Ar, FNA20, Semple (2003).

Goldenrod species with a primary range in the Piedmont and Mountains

Solidago arguta Aiton. SHARP-LEAVED GOLDENROD. Hab: Woodlands, woodland borders, road margins. Dist: S. ME and s. ON south to NC and TN; disjunct in s. OL, MO, and (?) AR. Phen: Aug-Oct. Tax: The western populations have been called *S. arguta* var. *neurolepis* or *S. neurolepis*. Syn: = F, G, Il, S, Semple et al (2021); = *Solidago arguta* Aiton ssp. *arguta* – C, SE1, W; = *Solidago arguta* Aiton ssp. *arguta* var. *arguta* – FNA20; = *Solidago arguta* Aiton – K4, NE, NY, Pa, Tn, Va; < *Solidago arguta* Aiton – RAB; < *Solidago arguta* Aiton – K1, Johnson (1995); > *Solidago arguta* Aiton var. *neurolepis* (Fernald) Steyerf.; > *Solidago neurolepis* Fernald – F.

Solidago flexicaulis L. ZIGZAG GOLDENROD, BROAD-LEAVED GOLDENROD. Hab: Moist wooded slopes, especially over calcareous or mafic rocks. Dist: NS, ON, and ND south to GA, AL, and KS. Phen: Jul-Oct. Syn: = Ar, C, F, FNA20, G, GrPl, Il, K1, K3, K4, Mi, NE, NY, Oh3, Pa, RAB, S, SE1, Tn, Va, W, WV, Johnson (1995); > *Solidago latifolia* L.

Goldenrod species with a primary range in the Mountains (some occur rarely to infrequently in the Piedmont)

Solidago canadensis* L. var. *canadensis. CANADA GOLDENROD. Hab: Old fields, pastures, roadsides. Dist: NL (Newfoundland) west to MN, south to VA, OH, and IL. Phen: Aug-Oct. Comm: See Fernald (1950), p. 1408. Syn: = C, F, FNA20, GrPl, Il, K1, K3, K4, Mi, NE, NY, Pa, SE1, Va; < *Solidago canadensis* L. – Oh3, S, WV; < *Solidago canadensis* L. var. *canadensis* – G.

Solidago canadensis* L. var. *hargerii Fernald. HARGER'S GOLDENROD. Hab: Old fields, pastures, roadsides. Dist: VT and NH west to MN, south to VA, NC, TN, OH, IL, and IA. First reported for

NC by Poindexter & Murrell (2008) and for TN by Morton (2017). Likely much more common than assumed, but misrepresented due to taxonomic confusion with *S. altissima*. Phen: Aug-Oct. Syn: = C, F, FNA20, GrPI, IL, K1, K3, K4, MI, NE, NY, Pa, SE1, Va, Johnson (1995); = n/a – RAB; < *Solidago canadensis* L. – Oh3, S, W, WV; < *Solidago canadensis* L. var. *canadensis* – G.

Solidago curtisii Torr. & A. Gray. CURTIS' GOLDENROD. Hab: Moist forested slopes, and rarely in mafic woodlands in the Piedmont of VA. Dist: A Central and Southern Appalachian endemic: WV south to n. GA and n. AL. Phen: Sep-Oct. Tax: Var. *curtisii*, with stem glabrous or slightly puberulent in the inflorescence, and var. *pubens* (M.A. Curtis) A. Gray, with stem densely puberulent, are sometimes distinguished. They do not appear to be worthy of taxonomic recognition. Syn: = C, K3, K4, Pa, SE1, Tn, Va, W, WV; = *Solidago caesia* L. var. *curtisii* (Torr. & A. Gray) Wood – Johnson (1995); = *Solidago curtisii* Torr. & A. Gray var. *curtisii* – FNA20; < *Solidago curtisii* Torr. & A. Gray – K1; > *Solidago curtisii* Torr. & A. Gray – S; < *Solidago curtisii* Torr. & A. Gray var. *curtisii* – RAB; > *Solidago curtisii* Torr. & A. Gray var. *curtisii* – F, G; > *Solidago curtisii* Torr. & A. Gray var. *pubens* (M.A. Curtis) A. Gray – F, G, RAB; > *Solidago pubens* M.A. Curtis – S.

Solidago harrisii Steele. SHALE BARREN GOLDENROD. Hab: Limestone, dolostone, greenstone, shale, and calcareous siltstone woodlands, barrens, and cliffs. Dist: A Central Appalachian endemic: sc. PA south to e. WV and w. VA. Phen: Aug-Sep. Syn: = F, S, Va, W, WV, Semple et al (2021); = *Solidago arguta* Aiton ssp. *arguta* var. *harrisii* – FNA20; = *Solidago arguta* Aiton var. *harrisii* (Steele) Cronquist – C, K1, K4, Pa, SE1, Johnson (1995); < *Solidago boottii* Hook. var. *boottii* – G.

Solidago hispida Muhl. ex Willd. var. ***hispida***. HAIRY GOLDENROD. Hab: Dry rocky forests and woodland edges. Dist: NL (Labrador) west to SK, south to nw. GA, AL, AR, IA, and SD. Widespread in e. and c. TN (Chester, Wofford, & Kral 1997) and in nw. GA (Jones & Coile 1988). Also reported for NC and SC by Kartesz (1999, 2010). Our variety is the typic; other varieties are more northern, around the Great Lakes and in maritime Canada. Phen: Jul-Oct. Syn: = F, G, MI, NE, LeBlond (2000), Semple et al (2017a); = n/a – RAB; < *Solidago hispida* Muhl. ex Willd. – Ar, C, FNA20, K3, K4, NY, Oh3, Pa, S, SE1, Tn, Va, W, WV, Johnson (1995); > *Solidago hispida* Muhl. ex Willd. var. *hispida* – F, G, IL, K1, Mo2.

Solidago randii (Porter) Britton. RAND'S GOLDENROD. Hab: Cliffs and barrens, primarily over mafic (such as greenstone and hornblende) or calcareous rocks. Dist: NS west to ON and MI, south to w. VA and WV. Phen: Jul-Sep. Syn: = K4, NY, Va, WV, Semple & Peirson (2013); = *Solidago simplex* ssp. *randii*; = *Solidago simplex* Kunth ssp. *randii* (Porter) Ringius var. *randii* – K1; = *Solidago simplex* var. *randii* (Porter) Kartesz & Gandhi; = *Solidago spathulata* DC. ssp. *randii* (Porter) Cronquist var. *randii* – G; > *Solidago maxoni* Pollard – F; > *Solidago randii* (Porter) Britton – F; < *Solidago simplex* Kunth – Pa, Johnson (1995); < *Solidago simplex* Kunth ssp. *randii* (Porter) Ringius var. *monticola* (Porter) Ringius – C, FNA20, NE.

Solidago rigida L. STIFF GOLDENROD. Hab: Glades, barrens, and prairie-like areas, over mafic or calcareous rocks. Dist: RI and MA west to NY, s. ON, MI, WI, s. MN and c. NE, south to c. VA, sc.

NC, w. NC, sc. TN, c. AR, and se. TX. East of MI, IN, IL, MO, and OK, *Solidago rigida* is generally rare and restricted to relictual prairie-like situations. Reports of *S. rigida* in the Coastal Plain of MS and AL are based on *S. jacksonii*. Phen: Aug-Oct. Tax: This taxon is tetraploid ($2n=36$) through most of its range, with a few diploids reported for OK. Syn: = *Oligoneuron rigidum* (L.) Small; = *Oligoneuron rigidum* (L.) Small var. *rigidum* – Il, K1, NE, Nesom (1993b); = *Solidago rigida* L. ssp. *rigida* – Ar, FNA20, K3, K4, Mo2, Tn, Heard & Semple (1988); = *Solidago rigida* L. var. *rigida* – C, G, GrPI, NY, SE1, Va; < *Oligoneuron grandiflorus* (Raf.) Small; < *Solidago rigida* L. – F, Mi, NcTx, Oh3, Pa, RAB, Tx, W, Johnson (1995); < *Solidago rigida* L. var. *grandiflorus* – S.

Var. *glabrata* differs from var. *rigida* in its glabrous to sparsely pubescent leaves and stem. Like var. *rigida*, it has a primary range in the Midwest with Atlantic-slope disjunctions, but its overall distribution is more southern.

Solidago sphacelata Raf. LIMESTONE GOLDENROD. Hab: Rock outcrops and dry rocky forests, usually over calcareous or mafic rocks. Dist: C. VA, s. WV, s. OH, c. IN, and s. IL south to n. GA, c. AL, and ne. MS. Phen: (Jul-) Aug-Sep (-Oct). Syn: = C, F, FNA20, G, Il, K1, K3, K4, RAB, SE1, Tn, Va, W, WV, Johnson (1995), Semple et al (2021); = *Brachychaeta cordata* (Short & Peter) Torr. & A. Gray; = *Brachychaeta sphacelata* (Raf.) Britton – S; = *Solidago cordata* Short & Peter.

Solidago squarrosa Nutt. STOUT GOLDENROD. Hab: Upland forests. Dist: NB and ON south to DE, w. NC, OH, and s. IN. Phen: Aug-Sep. ID Notes: The spreading to usually recurved phyllaries are distinctive. Syn: = C, F, FNA20, G, K1, K3, K4, NE, NY, Oh3, Pa, RAB, S, SE1, Va, W, WV, Johnson (1995), Semple, Tong, & Chong (2017b).

Euthamia graminifolia (L.) Nutt. var. ***graminifolia***. COMMON GRASS-LEAVED GOLDENROD. Hab: Moist to dry weedy situations, riverbanks, bottomlands, bog margins. Dist: NL (Newfoundland) and MB south to MD, c. VA, WV, w. NC, MI, WI, CO, and NM. Phen: Aug-Oct.

Goldenrod species with a primary range in the Southwest Mountains

Solidago faucibus Wieboldt. GORGE GOLDENROD. Hab: Moist forests. Dist: S. WV south to sw. VA, se. KY, and ne. TN; disjunct in nw. SC. Phen: Late Aug-Oct. Tax: See Wieboldt & Semple (2003) for additional information. The SC populations have a different polyploid derivation than *S. faucibus* s.s., and should likely be recognized as a separate species (Patrick McMillan, pers. comm., 2022). Syn: = FNA20, K4, Tn, Va, Semple et al (2021); = n/a – C, F, RAB.

Solidago flaccidifolia Small. APPALACHIAN GOLDENROD. Hab: Forests. Dist: VA and KY south to GA and ne. AL; disjunct in nc. MS. Phen: Sep-Oct. Syn: = C, G, K1, K3, K4, SE1, Tn, Va, W; = *Solidago caesia* L. var. *paniculata* A. Gray; = *Solidago curtisii* Torr. & A. Gray var. *flaccidifolia* (Small) R.E. Cook & Semple – FNA20; = *Solidago latissimifolia* Mill. – S, misapplied; < *Solidago caesia* L. – F, RAB.

Solidago lancifolia (Torr. & A. Gray) Chapm. LANCE-LEAF GOLDENROD. Hab: Grassy balds, openings in spruce-fir and northern hardwoods forests, at high elevations. Dist: Sw. VA south to w. NC and e. TN. Phen: Late Aug-Sep. Tax: See Levy & Donaldson (2018) for detailed information. Syn: = C, FNA20, K3, K4, S, SE1, Tn, Va, W, Levy & Donaldson (2018); < *Solidago curtisii* Torr. & A. Gray – F, K1; < *Solidago curtisii* Torr. & A. Gray var. *curtisii* – RAB.

Solidago patula Muhl. ex Willd. ROUGH-LEAVED GOLDENROD. Hab: Bogs, seepages over mafic rocks, grassy balds (as Whitetop Mountain). Dist: NH, VT, NY, s. ON, MI and WI south to w. VA, w. NC, nc. GA, c. TN, w. TN, and se. MO. Coastal Plain records (except northwards, in DE, NJ, and NY) represent misidentifications of *S. salicina*. Phen: Aug-Sep (-Oct). Tax: Semple, Tong, & Pastolero (2012) have clarified the taxonomy, distribution, and nomenclature of this and *S. salicina*. ID Notes: The broad basal leaves, saturated wetland habitat, and finely but definitely scabrous upper leaf surface are distinctive. Syn: = Il, K3, K4, Mi, Tn, Semple et al (2021), Semple, Tong, & Pastolero (2012); = *Solidago patula* Muhl. ex Willd. ssp. *patula* – FNA20, Pa; = *Solidago patula* Muhl. ex Willd. var. *patula* – C, F, G, K1, NE, Oh3, RAB, SE1, Va, Johnson (1995); = *Solidago rigida* L. – S, misapplied; < *Solidago patula* Muhl. ex Willd. – GW2, W, WV.

Annotated Key to Virginia *Solidago* and *Euthamia* species

Perennial herbs, usually with erect stems, usually unbranched except in the inflorescence, but often clustered. Stem leaves sessile or nearly so, usually tapering to the base (rarely cordate). Basal leaves are terminal on short branches at the ground level; these are often larger, or different from, the stem leaves and may, or may not, be present at time of flowering. Heads usually numerous, but small; all of ours have pistillate and fertile ray flowers, 1-20 in number, yellow except on species (*S. bicolor*). Involucral bracts appressed, usually differing in length, the outer ones shortest, all more or less stiff at base. Receptacle small, flat, or slightly convex, pitted, without chaffy scales. Disk flowers are always yellow, perfect, and fertile. Pappus of equal, slender bristles. Achenes nearly cylindrical, many-ribbed.

This is a large, difficult genus because the plants of a species may vary greatly; many species are closely similar; and numerous hybrids occur. The rhizome or stem base and the basal leaves are often necessary or helpful in identification. The waxy pollen of these plants is not wind carried, so they are falsely accused of causing hay fever.

1a. Heads in axillary clusters or racemes (often 1-sided), generally forming large, loose or open panicles; leaves usually serrate, not linear and grass-like if entire, 2.

2a. Heads in small, axillary clusters, or on short, axillary branches, at several to many nodes; not forming terminal panicles, 3.

3a. Basal and lower stem leaves larger and different in shape from the upper ones, ray flowers 5 or more per head, 4.

4a. *Phyllaries with strongly recurved green tips - S. squarrosa*

4b. Phyllaris without recurved tips (may be slightly spreading), 5.

5a. Leaves pilose or setose, 6.

6a. Ray-flowers white to cream colored - ***S. bicolor***

6b. Ray-flowers orange-yellow; stems pubescent, often only at the base - ***S. hispida***

5b. Leaves glabrous or, at the most, finely puberulent on both sides or with the primary veins finely bristled, 7.

7a. Stems and branches of inflorescence (under magnification) appearing as if covered by a fine, dust-like puberulence - ***S. puberula***

7b. Stems and branches of inflorescence glabrous or pilose, 8.

8a. Stem leaves 2-20 (rarely more); plants usually of dry, rocky places, usually under 1 m. tall (except *S. stricta*), 9.

9a. Inflorescence hispid with short, stiff hairs, achenes glabrous, 10.

10a. Phyllaries linear to linear-long tapering, finely 3-nerved - ***S. roanensis***

10b. Phyllaries oblong and round-tipped, coarsely 1-nerved - ***S. erecta***

9b. Achenes pubescent, 11.

11a. Phyllaries, pedicels, and branches of inflorescence often minutely resinous; *lower cauline leaves obscurely toothed; plants non-stoloniferous* - ***S. racemosa***

11b. Phyllaries, pedicels, and branches of inflorescence often minutely resinous; *lower cauline leaves generally sharply toothed; plants non-stoloniferous; grows on mafic rocks* - ***S. randii***

11c. Pedicels and branches of inflorescence glabrous; *plants stoloniferous; a Coastal Plain species* –
S. stricta

8b. Stem leaves 18-40, coriaceous; heads few-flowered; stems 0.6-2 m. tall - ***S. speciosa***

3b. Basal and lower stem leaves short-petioled, smaller than the upper leaves usually deciduous by the time of flowering, ray flowers 3-5 per head, 12.

12a. Leaves broad, *not more than 2.5 times longer than wide, tapering abruptly to a winged petiole; stem angled* - ***S. flexicaulis***

12b. Leaves elliptic, long acuminate, 2.5-3 times as long as wide; petioles lacking stem angled -

S. flaccidifolia

12c. Leaves narrow, 3 to 10 times longer than wide, gradually tapering to the base, sessile or nearly so; *stem round, purple and glaucous* - ***S. caesia***

12d. Leaves narrow, 3 to 10 times longer than wide, long-acuminate; stem angled, striate; ray florets 2-4
- ***S. curtissii***

12e. Leaves narrow, 3 to 10 times longer than wide, stem angled, striate; ray florets 5-8 - ***S. lancifolia***

2b. Heads in prominent terminal, often nodding , panicles made up of numerous, one-sided, often curved racemes, 13.

13a. *Leaves fleshy, succulent, or leathery; plants found only on or near sea beaches and dunes –*

S. sempervirens

13b. Plants lacking thick, fleshy leaves; not growing near beaches, 14.

14a. Basal and lower stem leaves larger and of different shape than the upper ones, 15.

15a. Basal and lower cauline leaves petiolate with a cordate blade and/or a cordate-clasping petiole -

S. sphacelata

15b. *Leaves and stems densely covered with minute, spreading hairs; rays bright, pale yellow -*

S. nemoralis

15c. Plants glabrous or nearly so; leaf margins often ciliate; rays orange to deep yellow, 16.

16a. *Pedicels glabrous; upper leaves essentially entire; ray florets 7-13 - S. juncea.*

16b. *Pedicels glabrous; upper leaves entire or sparingly serrate; ray florets 3-7 - S. pinetorum*

16c. Pedicels and branches of inflorescence pubescent (hirtellous or pilose), 17.

17a. Lower surfaces of the leaves glabrous or at most scabrous, not hirsute, 18.

18a. Upper half of stem not quadrangular, leaves not papillate (minute bumps), margins mostly ciliate, 19.

19a. Bases of lower leaves clasping; *plants of peat swamps and bogs - S. uliginosa*

19b. Bases of lower leaves not clasping; plants of drier areas, 20.

20a. Achenes glabrous, 21.

21a. Basal leaves abruptly narrowed to the petiole; *upper leaves serrate* vs. lookalike *S. juncea* -

S. arguta

20b. Achenes pubescent, 22.

22a. Leaves coriaceous (unusually firm or leathery in texture), scabrous above, the basal broadly ovate, 3-10 cm, wide - ***S. harrissi***

18b. *Upper half of stem quadrangular and winged, leaves papillate-scabrous, the margins not ciliate -*

S. patula

18c. Leaves glabrous or nearly so; plants with slender stoloniferous rhizomes - ***S. tarda***

18d. Plants with slender stoloniferous rhizomes - ***S. faucibus***

17b. *Lower surface of the leaves pubescent*, basal leaves lanceolate to oblanceolate - ***S. ulmifolia***

14b. Basal leaves not much larger than the upper one, rarely forming rosettes, usually deciduous by time of flowering, 23.

23a. Leaves with 3 prominent, longitudinal veins or 2 lateral veins parallel with the midrib, 24.

24a. *Stems glabrous, often glaucous, below the inflorescence* - ***S. gigantea***.

24b. Stems hairy or roughened, at least for some distance below the inflorescence, 25.

25a. Leaves firm, densely fine-pubescent beneath, rough above; stem densely fine hairy - ***S. altissima***

25b. Leaves thin, sparsely fine-pubescent beneath, often only on the veins, leaves usually shallowly serrate to nearly entire; lower to midstem glabrous or sparsely pubescent - ***S. canadensis* var.**

canadensis

25c. Leaves thin, sparsely fine-pubescent beneath, often only on the veins, *leaves usually sharply serrate*; lower to midstem moderately pubescent - ***S. canadensis* var. *hargeri***

25d. Larger leaves linear to lance-linear, 2-7 mm wide, twisted at base - ***S. tortifolia***

25e. Larger leaves linear to lance-linear, 5-30 mm wide, not twisted at base - ***S. rupestris***

23b. Leaves pinnately veined or without prominent veins parallel to the midrib, 26.

26a. Leaves sessile by rounded bases, entire or nearly so, linear to oblong, midrib prominent beneath, 27.

27a. *Leaves all entire*, with small, translucent dots; *usually anise scented* when bruised; *stem usually glabrous* or puberulent ones in narrow lines; without stolons - ***S. odora***

27b. Leaves shallowly toothed, without translucent dots; without anise odor when bruised; stem pubescent; stoloniferous; *a Coastal Plain species* - ***S. fistulosa***

26b. Leaves gradually narrowed to the base, coarsely toothed, oblanceolate or oblong to elliptic or ovate; lateral veins mostly very conspicuous, 28.

28a. Stem glabrous throughout or to near the inflorescence, 29.

29a. Leaves glabrous beneath, 30.

30a. Middle phyllaries oblong, obtuse; pappus 3-5 mm. long; *a Coastal Plain species* - ***S. latissimifolia*** (*S. elliotii*)

30b. Phyllaries linear-lanceolate to linear-oblong; pappus 2-3 mm. long - ***S. rugosa* var. *spagnophila***

29b. Leaves pubescent beneath, hispid to villous on the nerves below - ***S. ulmifolia***

28b. Stem pubescent, either villous, scabrous hirsute, or scabrous puberulent - ***S. rugosa***

1b. Inflorescence rather flat-topped, corymbose, the heads clustered near the ends of several, lateral branches; leaves usually linear, narrow, with entire margins, 31.

31a. Leaves of different sizes, *thick, grayish, pubescent on both surfaces*; the basal ones petioled and larger than the upper ones, basal blades oval to oblong, crenate-dentate, 3-10 cm. wide, not glandular punctate or dotted - ***S. rigida***

31b. Leaves uniform, sessile, linear to narrow-oblong, glandular-punctate, 32.

32a. Leaves with 3 prominent, longitudinal nerves, 2-12 mm. wide; this variety is characterized by montane plants with glabrous or nearly glabrous vestiture - ***E. graminifolia* var. *graminifolia*** (*S. graminifolia*)

32b. Leaves with 3 prominent, longitudinal nerves, 2-12 mm. wide; this variety is characterized by plants of the Piedmont and Coastal Plain with hirtellous or short-villous hairs on leaf undersides, upper stem, and branches - ***E. graminifolia* var. *nuttallii*** (*S. graminifolia*)

32c. Leaves with one prominent vein, or faintly 3-nerved, 1-4 mm. wide, 33.

33a. Leaves flat, or with incurved margins; linear-lanceolate, 2-4 mm. wide - ***E. caroliniana*** (*S. tenuifolia*)

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