

CYTOGEOGRAPHY OF *SYMPHYOTRICHUM DUMOSUM* AND *S. SIMMONDSII* (ASTERACEAE: ASTEREAEE)

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ABSTRACT

Chromosome numbers previously have been reported for 50 individuals of *Symphytotrichum dumosum* and 5 individuals of *S. simmondsii*. In addition, 95 new reports for *S. dumosum* to variety and 19 new reports for *S. simmondsii* bring the total number of counts to 169, covering most of the geographical ranges of the two species. Cyto geography maps are presented for both species.

In total, 50 chromosome number counts have been reported previously (Appendix 1) for *Symphytotrichum dumosum* (L.) Nesom and 5 counts for *S. simmondsii* (Small) Nesom, mostly under the names *Aster dumosus* L. and *Aster simmondsii* Small. Twenty-four diploid counts ($2n=8_{II}$, $2n=16$) were reported for *Aster dumosus* by Jones (1980), Semple & Brouillet (1980), Semple (1985), Semple and Chmielewski (1987), Semple et al. (1989, 1992, 1993) and Semple and Cook (2004). Eleven tetraploid counts ($2n=16_{II}$, $2n=32$) were reported for *A. dumosus* by Jones (1980), Semple and Brouillet (1980), Semple (1985), Semple et al. (1989, 2003), and Semple and Cook (2004). One count of $2n=16$ was reported for *S. dumosum* cult. var. “Pink Cloud” by Semple et al. (2015).

Five octoploid counts ($2n=32_{II}$, $2n=64$) were reported for *Symphytotrichum simmondsii* by Turner (1978, as *Aster purpuratus*, $n=ca$ 30 pairs), Semple et al. (1983), Semple (1985), and Semple and Cook (2004). The cyto geographies of the two species have not been presented previously.

Semple (2024) has reviewed the nomenclature of the *Symphytotrichum dumosum* complex and accepted four varieties within *S. dumosum*; *Symphytotrichum dumosum* var. *coridifolium* (Michx.) Semple, M. Horsburgh, and M. Haggitt, var. *dumosum*, var. *strictior* (Torr. & Gray) Nesom, and var. *subulifolium* (Torr. & Gray) Nesom. Semple et al. (2024) discussed morphological features of the four varieties investigated in a multivariate analysis. Ray floret color and orientation of mid stem, upper stem and branch leaves were found useful in assigning most individuals to a variety.

MATERIALS AND METHODS

Meiotic counts were made from pollen mother cells (PMCs) dissected from buds fixed in the field in 3:1 ethanol (EtOH): glacial acetic acid for a minimum of 24 hours under refrigeration and subsequently stored under refrigeration in 70% EtOH. Mitotic counts were made from root tip cells taken from transplanted wild rootstocks or from seedlings grown from achenes collected in the wild. Root tips were pretreated in 0.01% colchicine or saturated paradichlorobenzene for 2–3 hours, fixed in either Modified Carnoy’s Fixative (4:3:1 chloroform:EtOH:glacial acetic acid) or Acetic Alcohol Fixative (3:1 EtOH:glacial acetic acid) for a minimum of 24 hours under refrigeration and hydrolyzed in 1N HCl for 30 min at 60°C before squashing. Anther sacs containing PMCs and meristematic root tips were squashed in 1% acetic orcein and counts of chromosomes were made from freshly prepared material.

Vouchers for all previously unpublished counts were deposited in WAT in MT (or will be and are currently in the possession of the first author). Identifications were reconfirmed for this study by the first author either from collections in WAT in MT or on hand in Waterloo, and from digital images taken by the first author, from images available on line through SERNEC (2022), and from digital images provided by the staff of the herbarium at the Jardin botanique (MT) in Montréal, Québec.

RESULTS AND DISCUSSION

Identifications of the vouchers for 50 previously reported chromosome counts for specimens of *Symphyotrichum dumosum* and 5 previously reported counts for specimens *S. simmondsii* were confirmed and are listed to variety in Appendix 1. In total, 95 previously unreported chromosome counts for individuals of *S. dumosum* and 19 previously unreported counts for *S. simmondsii* are listed to variety in Appendix 2. In total, 169 counts are now known for *S. dumosum* and *S. simmondsii*. The first reports for counts for *S. dumosum* were by Jones (1980; $2n=7_{II}+2_{I}+$ frags., $2n=8_{II}$, $2n=8_{II}+1B$ super. or frags., and $2n=16_{II}$) and Semple and Brouillet (1980; $2n=8_{II}$ and $2n=16$) with subsequent reports to species by Semple (1985), Semple & Chmielewski (1987), Semple, Chmielewski and Lane (1989), Semple, Chmielewski and Xiang (1992), Semple, Zhang and Xiang (1993), Semple and Cook (2004), and Semple, et al. (2015). The first report for *S. simmondsii* was reported by Turner (1978) as $2n=cf.c.30_{II}$ from Dade Co., Florida (Pleitman & Turner F-26 FTG!) as *Aster purpuratus* Nees with subsequent counts by Semple (1985) for *S. simmondsii* ($2n=32_{II}$ as *Aster simmondsii*) and $2n=64$ by Semple, Chmielewski and Chinnappa (1983 as *Aster simmondsii*), and Semple and Cook (2004 as *Symphyotrichum simmondsii*).

The cytogeography of *Symphyotrichum dumosum* is shown in Fig. 1. The ranges of the four varieties recognized here are also shown in Fig. 1 and are based on a large number of collections seen in person or via SERNEC. The var. *dumosum* and the var. *strictior* (Torr. & A. Gray) Nesom are northern in distribution and are nearly allopatric with overlaps in ranges in southeastern Missouri and possibly western Pennsylvania. All collections from New England, southeastern New York, eastern Pennsylvania and Delaware were determined to belong in var. *dumosum* which occurs at both diploid and tetraploid levels. All collections observed from Wisconsin, Michigan, and Ontario were determined to belong in var. *strictior*, which is only known at the tetraploid level. All collections of var. *coridifolium* came from Pennsylvania south to central Florida west to southern Missouri and south to eastern Texas with diploids and tetraploids occurring over the entire range of the variety. All collections of var. *subulifolium* came from southeastern North Carolina south to southern Florida on the coastal plain and west to eastern Texas and north to southern Oklahoma and adjacent Arkansas with considerable overlap with the southern range of var. *coridifolium*. Diploids and tetraploids occurred throughout much of the range of var. *subulifolium* but sampling was sparse in the western portions of the range. Intermediates between the two southern varieties were sampled in areas of sympatry with a diploid sampled in South Carolina and tetraploids sampled in South Carolina, Georgia, Florida and Louisiana.

The cytogeography of *Symphyotrichum simmondsii* is shown in Figure 2. The species occurs on the coastal plain from northeastern North Carolina to southern Florida with the range extending across Florida panhandle to Dauphin Island, Alabama. All counts were octoploid in North Carolina, South Carolina, and Florida. No counts are known for plants from Georgia and Alabama.

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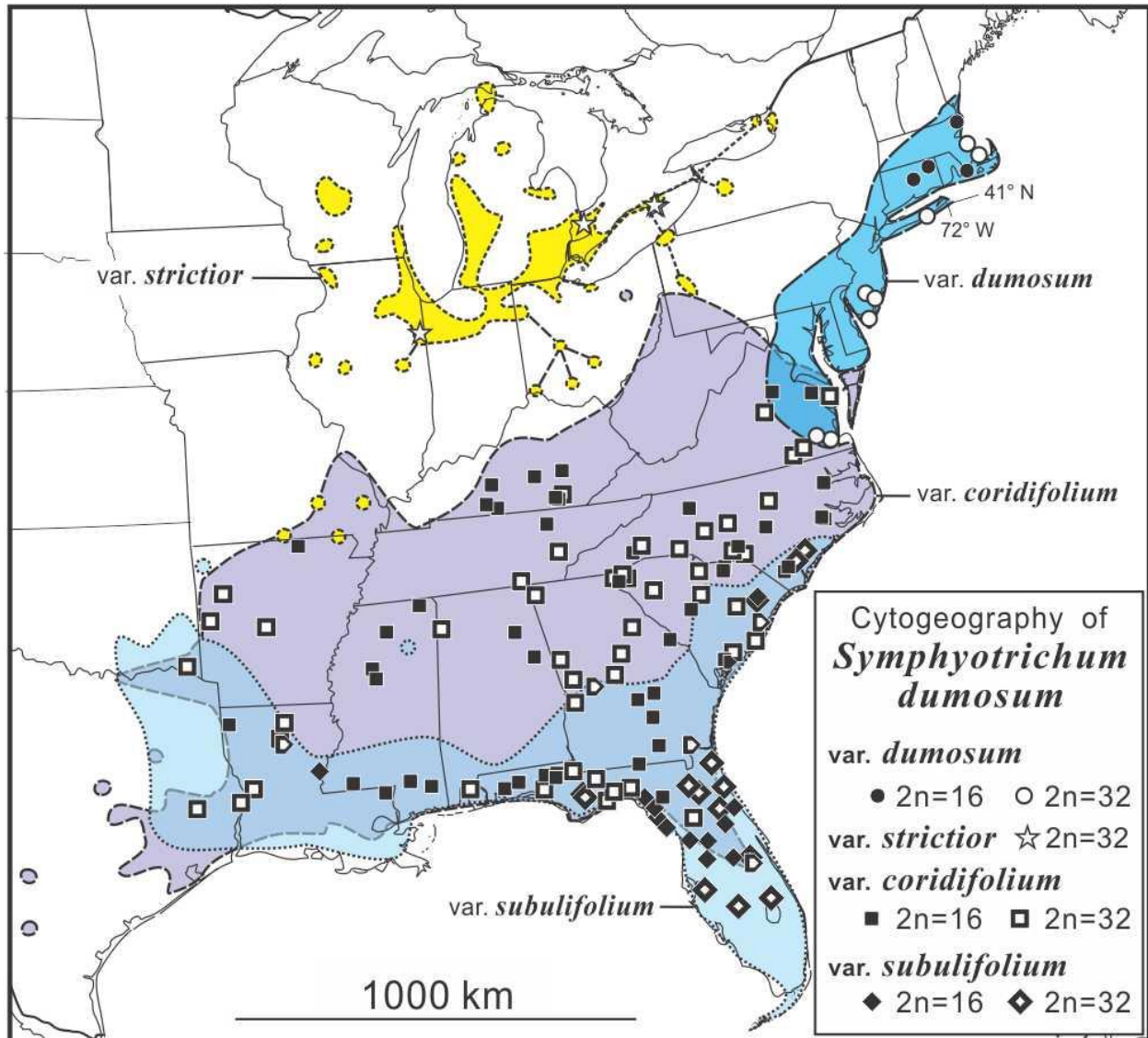


Figure 1. Distribution of cytotypes of *Symphyotrichum dumosum*: var. *dumosum* (2x black dots, 4x solid white circles; var. *strictior* (4x solid white stars); var. *coridifolium* (2x black squares, 4x white with thick black outline), var. *subulifolium* (2x black diamonds, 4x, white diamonds with thick black outline); hybrid symbols indicate plants that are likely varietal intermediates. The colored ranges of the four varieties are indicated in broken-lines and are based on all herbarium specimens examined and reports in the literature.

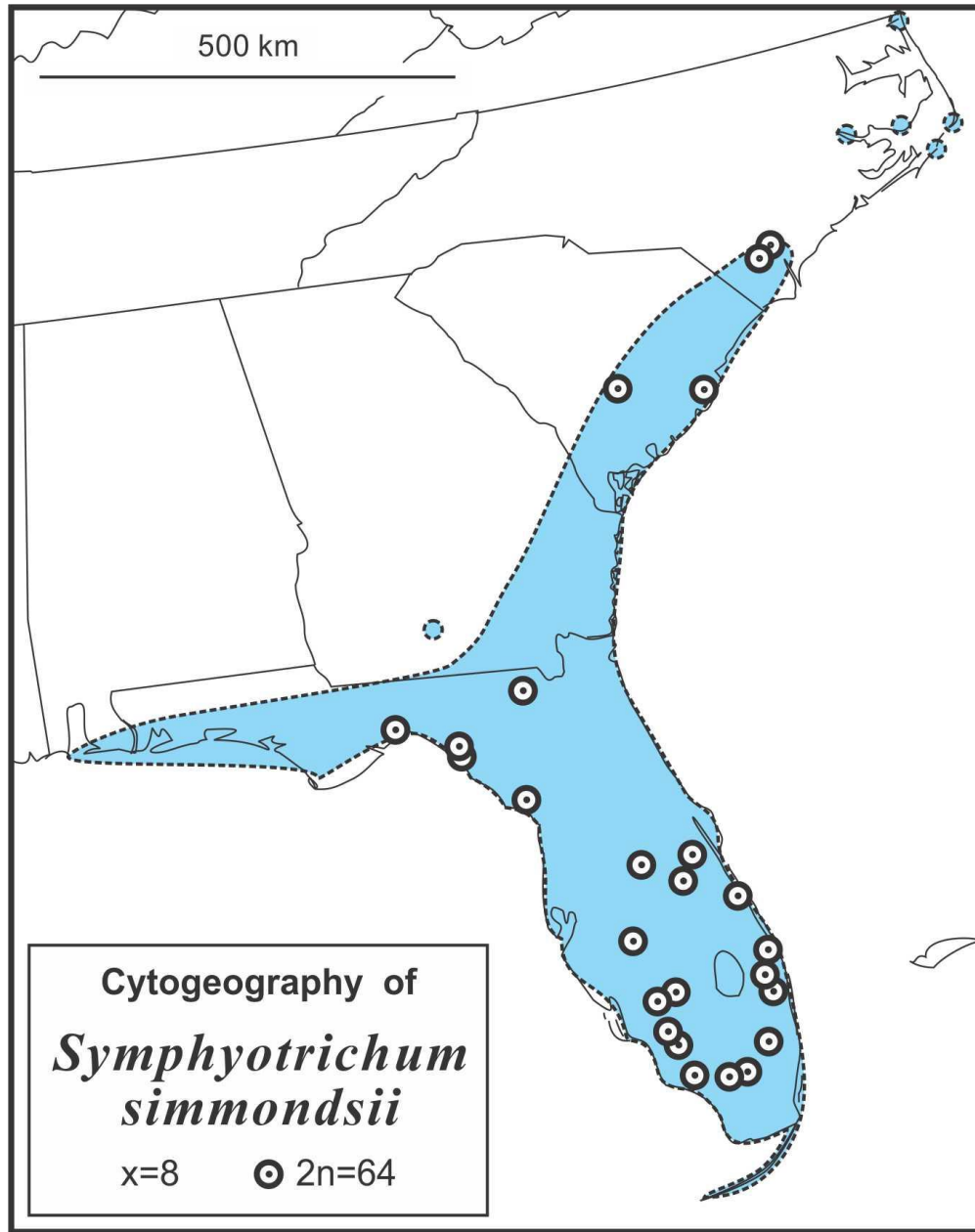


Figure 2. Distribution of cytotypes of *Symphyotrichum simmondsii*: octoploids 8x, circles with dot; range based on all collections seen and literature.

Appendix 1. Previously reported chromosome number determinations in *Symphyotrichum dumosum* and *S. simmondsii* from Canada and the USA. All vouchers in WAT; *Bt* = L. Brouillet; *C*, J. Canne; *Ch* = J. Chmielewski; *H*, C. Hart; *S* = J.C. Semple; *S* & *S* = J.C. & B. Semple.

- Symphyotrichum dumosum* var. *coridifolium*** (Michx.) Semple, Horsburgh & Hayter. — $2n=7_{II}+2_{I+}$ frags. U.S.A. **Mississippi.**: Lafayette Co., *A.Jones* 5303 orig. AGJ 4420 (ILL). (A.G. Jones 1980), "with introgression of *Aster vimineus* var. *subdumosum*. — $2n=8_{II}$ U.S.A. **Georgia.**: Dodge Co., Chauncey, *A.Jones* & *Nurtjahjo* 3517 ILL (A.G. Jones 1980). **Kentucky.**: Whitley Co., *A.Jones* 3874 orig. AGJ & *Nurtjahjo* 3414A ILL (A.G. Jones 1980). **Mississippi.** Lafayette Co., *A.Jones* 4773 orig. 4423 (A.G. Jones 1980). **North Carolina.** Bertie Co., Semple & *Suripto* 9740 WAT (Semple, Zhang and Xiang 1993, to species), Semple & *Suripto* 9741 WAT (Semple, Zhang and Xiang 1993, to species). Yadkin Co., Semple & *Suripto* 9708 WAT. (Semple, Zhang and Xiang 1993 as *A. dumosum*), Semple & *Suripto* 9709 WAT (Semple, Zhang and Xiang 1993 as *A. dumosum*). **South Carolina.** Chesterfield Co., Semple *Brammall* & *Hart* 3049 WAT (Semple and Brouillet 1980 as *A. dumosum*). Colleton Co., *A.Jones* & *Nurtjahjo* 3510 ILL (A.G. Jones 1980 as *A. dumosus* var. *pergracilis*). — $2n=8_{II}+1B$ super. or frags. U.S.A. **Kentucky.**: Edmonson Co., *A.Jones* 5092 orig. 4481 ILL (A.G. Jones 1980 as *A. dumosus* var. *pergracilis*); Whitley Co., *A.Jones* & *Nurtjahjo* 3417 ILL (A.G. Jones 1980 as *A. dumosus* var. *pergracilis*). **South Carolina.** Colleton Co., *A.Jones* & *Nurtjahjo* 3507 ILL (A.G. Jones 1980 as *A. dumosus* var. *pergracilis*), *A.Jones* & *Nurtjahjo* 3509 ILL (A.G. Jones 1980 as *A. dumosus* var. *pergracilis*); Lexington Co., *A.Jones* 4677 orig. AGJ & *Nurtjahjo* 3446 ILL (A.G. Jones 1980 "plant atypical perhaps showing introgression of *A. vim.*"). — $2n=16$ U.S.A. **Arkansas.**: Fulton Co., Semple & *Heard* 8319 WAT (Semple and Chmielewski 1987, as *A. dumosum*). **Florida.**: Holmes Co., Semple & *Godfrey* 3171 WAT (Semple and Brouillet 1980, as *A. dumosum*); Washington Co., Semple 10951 WAT (Semple and Cook 2004, to species). **Kentucky.** Allen Co., Semple & Chmielewski 9108 WAT (Semple, Chmielewski and Lane 1989, as *A. dumosum*); Pulaski Co., Semple & *Suripto* 9604 WAT (Semple, Zhang and Xiang 1993, as *A. dumosus*). **Mississippi.** Amite Co., Semple & *Suripto* 10102 WAT (Semple, Zhang and Xiang 1993 as *A. dumosus*). **North Carolina.** Henderson Co., Semple *Brammall* & *Hart* 3030 WAT (Semple and Brouillet 1980, as *A. dumosus*). **South Carolina.** Chesterfield Co., Semple & Chmielewski 6078 WAT (Semple, Chmielewski and Lane 1989, as *A. dumosus*). **Tennessee.** Morgan Co., Semple *Brammall* & *Hart* 3004 WAT (Semple and Brouillet 1980, as *A. dumosus*). — $2n=16_{II}$ U.S.A. **Georgia.**: Bibb Co., *A.Jones* & *Nurtjahjo* 3518 ILL (A.G. Jones 1980, as *A. dumosus* var. *dumosus*). **Louisiana.** Ouachita Par., *Thomas* s.n. = *A.Jones* 3339 ILL (A.G. Jones 1980; as *A. brachypholis*). **South Carolina.** Colleton Co., *A.Jones* & *Nurtjahjo* 3513 ILL (A.G. Jones 1980, as *A. dumosus* var. *dumosus*). — $2n=16_{II}+$ frag. U.S.A. **Kentucky.** Whitley Co., *A.Jones* & *Nurtjahjo* 3416 ILL (A.G. Jones 1980, as *A. dumosus* var. *dumosus*). — $2n=32$ U.S.A. **Arkansas.** Franklin Co., Semple & *Suripto* 9966 WAT (Semple, Zhang and Xiang 1993, as *A. dumosus*); Sebastian Co., Semple & *Suripto* 9980 WAT (Semple, Zhang and Xiang 1993, as *A. dumosus*). **Georgia.** Dade Co., Semple 10994 WAT. Semple and Cook 2004, to species); Harris Co., Semple 10980 WAT Semple and Cook 2004, to species). **Louisiana.** Vernon Par., Semple & *Suripto* 10041 WAT (Semple, Zhang and Xiang 1993, as *A. dumosus*). **Oklahoma.** McCurtain Co., Semple & *Suripto* 9995 WAT (Semple, Zhang and Xiang 1993, as *A. dumosus*). **South Carolina.** Clarendon Co., Semple & *Suripto* 9784 WAT (Semple, Zhang and Xiang 1993, as *A. dumosus*). **Texas.** Newton Co., Semple & *Suripto* 10048 WAT (Semple, Zhang and Xiang 1993, as *A. dumosus*).
- Symphyotrichum dumosum*** (L) Nesom cv. "Pink Cloud" — $2n=16$ CANADA. **Ontario.** Waterloo Reg. Mun., cultivated, Semple 11022 WAT (Semple et al. 2015).
- Symphyotrichum dumosum* var. *dumosum*** — $2n=16$ U.S.A. **Connecticut.** Windham Co., Semple & *Brouillet* 3604 WAT (Semple and Brouillet 1980, as *A. dumosus*). **Massachusetts.** Bristol Co., Semple & *Brouillet* 3580 WAT (Semple and Brouillet 1980, as *A. dumosus*); Essex Co., Semple & *Suripto* 9574 WAT (Semple, Zhang and Xiang 1993, as *A. dumosus*). — $2n=32$ U.S.A. **New York.** Suffolk Co., Semple 6855 WAT (Semple 1985, as *A. dumosus*).
- Symphyotrichum dumosum* var. *strictior*** (Torr. & Gray) Nesom — $2n=16_{II}$ U.S.A. **Illinois.** Iroquois Co., *A.Jones* 698, 3304 ILL (A.G. Jones 1980, as *A. dumosus* var. *strictior*). — $2n=32$ CANADA. **Ontario.** Haldimand-Norfolk R.M.; Semple 2961 WAT (Semple and Brouillet 1980, as *A. dumosus*), Semple 2964 WAT. (Semple and Brouillet 1980, as *A. dumosus*).
- Symphyotrichum dumosum* var. *subulifolium*** (Torr. & Gray) Nesom — $2n=8_{II}$ U.S.A. **Florida.** Oseola Co., Semple et al 5348 WAT (Semple, Chmielewski and Chinnappa 1983, as *A. dumosus*). — $2n=16$ U.S.A. **Florida.** Pasco Co., Semple et al. 5414 WAT (Semple 1985, as *A. dumosus*). **Louisiana.** Concordia Par., Semple & *Suripto* 10096 WAT (Semple, Zhang and Xiang 1993 as *A. dumosum*). **South Carolina.** Florence Co., Semple &

Chmielewski 6116 WAT (Semple, Chmielewski and Xiang 1992, as *A. dumosus*). — $2n=32$ U.S.A.. **Florida**. Okeechobee Co., *Semple et al. 7511* WAT (Semple, Chmielewski and Lane 1989, as *A. dumosus*).

Symphyotrichum simmondsii (Small) Nesom — $2n=cf.c.30_{II}$ U.S.A. **Florida**. Dade Co. *Pleittman & Turner F-26* FTG! (Turner 1978, as *Aster purpuratus* Nees). — $2n=32_{II}$ U.S.A.. **Florida**. Broward Co., *Semple & B. Semple 5360* (Semple 1985). — $2n=64$ U.S.A. **Florida**. Collier Co., *Semple & B. Semple 5403* WAT (Semple, Chmielewski & Chinnappa 1983), *Semple & B. Semple 5398* WAT (Semple 1985); Hamilton Co., *Semple 10965* WAT (Semple and Cook 2004).

Appendix 2. Previously unreported chromosome number determinations in *Symphyotrichum dumosum* and *S. simmondsii* from Canada and the USA. All vouchers in WAT; *Bt* = L. Brouillet; *C*, J. Canne; *Ch* = J. Chmielewski; *H*, C. Hart; *S* = J.C. Semple; *S & S* = J.C. & B. Semple.

Symphyotrichum dumosum var. *coridifolium* (Michx.) Semple, M. Horsburgh & M.L. Haggitt — $2n = 16$. U.S.A. **Alabama**: Etowah Co., N of Attalla *S & Ch 6304*. Randolph Co., N of Wedowee *S & Ch 6312*. **Florida**: Santa Rosa Co.: W of Harold, *S, Bt & C 3878*. Washington Co., E of Chipley, *S, Bt & C 3904*; Suwanee Co., W of Hildreth, *S, Bt & C 3928*. **Georgia**: Clinch Co., N of Homerville, *S, Bt & C 4014*. Coffee Co., S of Boxton, *S, Bt & C 4025*. Laurens Co., S of Garretta *S, Bt & C 4038*; Loundes Co., W of Valdosta *S & S 7420*. Richmond Co., SW of Augusta, *S, Bt & C 4050*. **Kentucky**: Allen Co., S of Scottsville, *Chmielewski & Hart 956*. Casey Co., S of Dunnville, *Chmielewski & Hart 968*. **Louisiana**: Washington Par., N of Angie, *S, Bt & C 3827*. **Mississippi**: Alcorn Co., E of Strickland *S & Ch 6383*. Forrest Co., Brooklyn *S, Bt & C 3837*; George Co., W of Benndale, *S, Bt & C 3852*; Montgomery Co., S of Duck Hill *S, Bt & C 3799*; N of Winona *S, Bt & C 3805*. **North Carolina**: Columbus Co., NC-11 just N of Freeman, *S & Weakley 11782*; Lake Waccamaw, *Chmielewski & Hart 358*; Craven Co., NW of Vanceboro, *S & Ch 6048, S & Ch 6050*. Harnett Co., S of Lillington, *S & Ch 6058*. Richmond Co., Sandhills Game Land, NW of Entwistle, *S & B. Currie 11799*; Wake Co., S of Creedmore, *Chmielewski & Hart 343*.

South Carolina: Oconee Co., US-76 ca 3 km E of state line, *R. Cook & family 635*. **Virginia**: Essex Co., SE of Chance, *S & Ch 5963*. Fluvanna Co., N of Palmyra *Chmielewski & Hart 326*. — $2n = 32$. U.S.A. **Alabama**: Baldwin Co., E of Spanish Fort, *S, Bt & C 3865*. Franklin Co., W of Atwood, *S & Ch 6376*. **Florida**: Gadsden Co., W of Gadsden, *S, Bt & C 3910*. Marion Co., E of Williston, Co.Rd.-318 5.6 km E of US-27, *S 10961*. Jackson Co., NW of Marianna *S & Ch 6335*. Taylor Co., W of Hampton Springs, *S & S 7442*. Wakulla Co., N of Ivan, US-319 N of FL-267, *S & S 7428*; N of Panacea *S & S 7440*; Walton Co., E of Bruce *S & Ch 6344*. **Georgia**: Ogelthorpe Co., SE of Lexington, *S & Ch 6143*; Putnum Co., SW of Warfield, US-129 SE of Little R. near Macon Crescent, 6.3 km N of GA-212, *S 10873*; Rabun Co., Chattooga R. by US-76, *S & Ch 6197*; Stewart Co., N of Lumpkin *S & Ch 6324*. **Louisiana**: Jackson Par., S of Jonesboro, *S & Ch 6417*. **North Carolina**: Gaston Co., Dallas, *S, Bt & C 4070*. Randolph Co., N of Seagrove, *Chmielewski & Hart 390*. Richmond Co., E of Rockingham, *Chmielewski & Hart 368*; Rutherford Co., *Canne 1750*; Scotland Co., E of Hamlet, *Chmielewski & Hart 365*. **South Carolina**: Chester Co., US-21 S of Great Falls, 1.7 mi S of SC-9, *Canne 1881*; Oconee Co., E of Salem, *S & Ch 6182*; junction of SC-130 and road to SC-107, *S 10849*; US-76 ca 3 km E of state line, *R. Cook & family 635*. **Tennessee**: Marion Co., SE of White City, *S & Ch 6284*. **Virginia**: Lancaster Co., N of Whitestone, *S & Ch 5978*. Sussex Co., US-301 2.3 mi N of VA-40, *S Brammall & Hart 3030*.

Symphyotrichum dumosum aff. var. *coridifolium* × *subulaefolium* — $2n = 32$. U.S.A. **Florida**: Osecola Co., W of Ashton, *S & S 7483*. **Georgia**: Charleston Co., Folkston *S & S 7549*. Louisiana: Jackson Par., S of Jonesboro, *S & Ch 6419*. **South Carolina**: Charleston Co., N of Philip, SC-41 6.8 km N of US-17, *R. Cook & family 690*.

Symphyotrichum dumosum var. *dumosum* — $2n = 16$. U.S.A. **Connecticut**. Tolland Co., W of Stafford

Springs, *S* 3704. — $2n = 32$. U.S.A. Massachusetts: Barnstable Co., Scusset Beach St. Res., along road. to beach, *S* & *S* 11034. **New Jersey.** Atlantic Co., S of Atsion, US-206 S of Dutchtown, *S* 11823; Port Republic, park by Mill Pond, *S* 11818; Cape May Co., W of Burleigh, *S* & *Ch* 6250. **Virginia.** Dinwiddie Co., SE of Mckenry, VA-40 E of Co.Rd-709, *S* 11767. Prince George Co., VA-10 4 km W of Burrowsville, *S* 11765.

Symphyotrichum dumosum var. *strictior* (Torr. & Gray) Nesom — $2n=32$ U.S.A. **New Jersey.** Cape May Co.: W of Burleigh, *S* & *Ch* 6250.

Symphyotrichum dumosum var. *subulifolium* (Torr. & Gray) Nesom $2n = 16$. U.S.A. **Florida.** Citrus Co., Crystal River, *S*, *Bt* & *C* 3971; Flager Co., US-1 N of Bummell, *S* & *Ch* 7536; Lake Co., N of Altoona, *S*, *Bt* & *C* 3987; Levy Co., US-98 4.6 mi N of Inglis *S*, *Bt* & *C* 3960; Sumter Co., E of Rutland, *S*, *Brouillet* & *Canne* 3979; Taylor Co., W of Smith, *S*, *Bt* & *C* 3921. **South Carolina:** Florence Co., US-51 N of Pamplico, *S* & *Ch* 6116. — $2n=32$ U.S.A. **Florida.** Bradford Co., N of Starke, *S*, *Bt* & *C* 4005; Duval Co., SE of Callahan, *S* & *S* 7548; Hillsborough Co., N of Sun City Center, *S* 5407; Osecola Co., W of Ashton, *S* & *S* 7482; Putnam Co., S of Rodman, *S*, *Bt* & *C* 3997; St. Johns Co., W of St. Augustine, *S* & *Ch* 7540; Union Co., W of E of Guilford, *S*, *Bt* & *C* 4008. **Georgia.** Taylor Co., SE of Carsonville, old US-19 N of GA-208, 1.4 km S of Little Patsiliga Creek, 3.6 km S of Five Pts., *S* 10973. **South Carolina:** Florence Co., N of Pamplico, *S* & *Ch* 6112; Georgetown Co., SC-41 ca. 5 mi S of Andrews at county line, *R. Cook* & family 668.

Symphyotrichum dumosum var. aff. *subulifolium* (Torr. & Gray) Nesom — $2n=16$ U.S.A. **Florida.** Okaloosa Co.: E of Crestview, *S*, *Bt* & *C* 3891.

Symphyotrichum simmondsii (Small) Nesom — $2n=36_{II}$ (likely $2n=32_{II}$ with several precociously divided bivalents) U.S.A. **Florida.** Broward Co., ca 20 airmiles west of Ft. Lauderdale along US hiway 27, *Pleittman* & *Turner F-35* FBG! (count by B.L. Turner); Collier Co., 10 mi SE of Monroe Station along Hiway 94, *Pleittman* & *Turner F-12* FBG! (count by B.L. Turner on voucher). — $2n = 64$. U.S.A. **Florida.** Collier Co.: S of Jerome, *S et al.* 5395, 5397; Dade Co.: SE of Paolita, *S et al.* 5391; Hardee Co.: S of Zolfo Springs, *S et al.* 7491; Hendry Co.: LaBelle, FL-80A just E of FL-29, *S* 11723; Lee Co., SE of East Fort Myers, near FL-82, junction of Meadow Rd and Vassinger Ave. *S*, *S* 11721; Levy Co., SE of Gulf Hammock, FL-326 4.4 km E of US-98, *S* 11710; Oseola Co.: N of Davenport, *S et al.* 5350, Holopaw, *S et al.* 5351-2, S of Narcoossee, *S et al.* 7472, N of Yeehaw Junction, *S* & *S* 5354; Palm Beach Co.: SW of Boca Raton, *S et al.* 5359, Loxahatchee, US-441/98 & FL-88, just E of Bink Forest Dr., , *S* 11726, *S* 11727; St. Lucie Co.: SE of Fort Pierce, junct. of Co.Rd-79 and Co.Rd-712, *S* 11737; Taylor Co.: SW of Salem, Fish Creek Rd. 5.6 km W of US-98, *Semple* 11696, *Semple* 11697, SW of Salem, Fish Creek Rd. 5.6 km W of US-98, *Semple* 11697, N of Steinhatchee, FL-361 0.2 km N of Salem Tower Rd., *Semple* 11705; Wakulla Co., US-98, between Wakulla R. and Newport Station, *S* 11694. **North Carolina.** Brunswick Co., NC-130 5.5 km N of US-17, NW edge of Shallotte Industrial Park, *S* 11790; Columbus Co., NC-11 N of Freeman (US-74/76), *S* & *Weakley* 11780; Pender Co., SW of Currie, NC-210 just S of entrance to Moore's Creek Nat'l Battlefield, *S* & *Weakley* 11779. **South Carolina.** Georgetown Co.: S of Andrews, *S* & *Ch* 6126.