

TWO NEW SPECIES OF *BOLTONIA* (ASTERACEAE: ASTEREAE), FROM THE CAROLINAS

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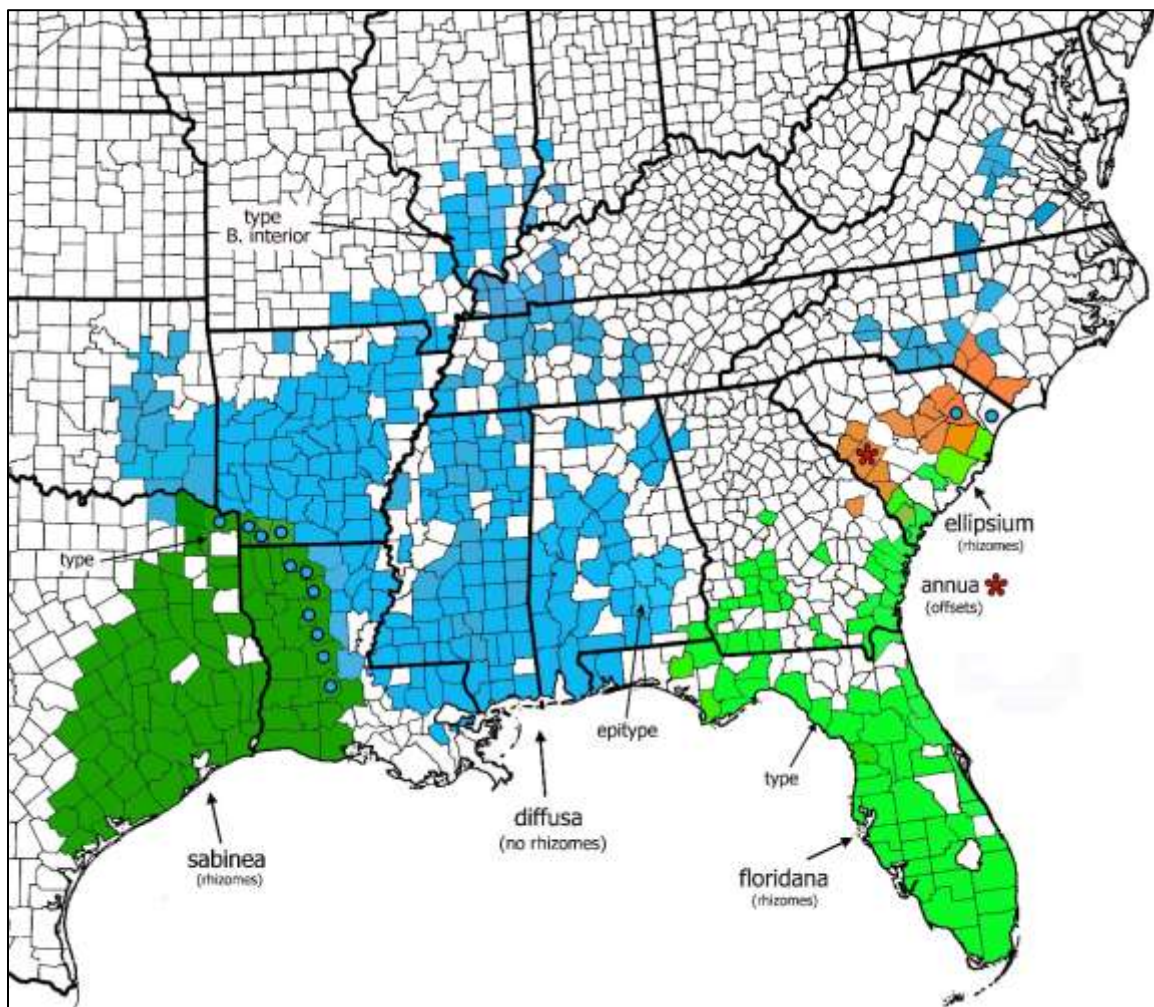
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ABSTRACT

Boltonia ellipsium Nesom, **sp. nov.**, is restricted to habitats associated with Carolina bays, mostly in South Carolina but extending into Georgia and southwestern North Carolina. ***Boltonia annua*** Nesom, **sp. nov.**, is known only from the type collection (about 56 individuals) in South Carolina but is distinctive in its duration and other features.

Two new species are described here, both of which apparently are ecologically true to habits associated with Carolina bays. The ranges of both are centered in South Carolina. *Boltonia ellipsium* appears to be, from morphology (long, multibracteate peduncles) and geography, part of the *Boltonia diffusa* group (Nesom 2026; Map 1), but it stands apart in its larger heads and longer achenial awns.



Map 1. Distribution of the Atlantic seaboard species of *Boltonia* discussed here, *B. ellipsium* and *B. annua*, and *B. diffusa* sensu stricto and segregates (Nesom 2026).

The second species described here is unusual — alone in the genus, and alone among the closest generic relatives of *Boltonia*, *Chloracantha* and *Batopilosa* (Nesom 2020), it is annual in duration. *Boltonia annua*, like *B. ellipsium*, occurs in a Carolina bay, and the type locality is within the geographic range of *B. ellipsium*. Plausibly, it might be a derivative of perennial *B. ellipsium*, but differences in inflorescence structure and leaf and fruit morphology suggest that they may not be so closely related.

BOLTONIA ELLIPSIUM Nesom, **sp. nov.** **TYPE: South Carolina.** Allendale Co.: [Ca. 9 air mi SW of Fairfax, ca. 32.85 N, 81.34 W], State Road S-3-26 [River Rd], 6.1 mi S of jct with Hwy 301, 0.3 mi N of jct with State Road S-3-41 [Cohens Bluff Rd], pond, 8 Sep 1967, *A.E. Radford 11420* (holotype: NCU; isotypes: APSC, AUA, CHRB, CONV, DOV, HTTU, LSU, MISS, NDA, PAC, UNCC, USMS, VSCM, WCUH, WILLI).

Similar to *Boltonia floridana* in its rhizomatous habit and paniculate inflorescence of small heads on minutely bracteate peduncles but distinct in its geography, larger heads, and longer achenes and awns. Similar to *B. cuneifolia* in its rhizomatous habit but distinct in its paniculate inflorescence. The epithet ("of the ellipses") alludes to the shape of the Carolina Bays.

Herbaceous perennials, fibrous-rooted, glabrous, usually with thin rhizomes up to 25 cm long, not producing leaves during flowering. **Stems** 50–80 cm, erect, 1-numerous from the base, sometimes proximally fistulose. **Leaves**: basal absent at flowering; lower and midcauline narrowly elliptic, 4–11 cm long, 6–11 mm wide, relatively even-sized up to the inflorescence, then becoming bracteate. **Inflorescence** paniculate to paniculate-corymboid (when heads fewer), heads solitary or usually on acute-ascending peduncles 1.5–5.5 cm long, peduncles mostly with 2–8 minute bracts. **Receptacle** low-conic. **Invulcres** 5–6(–6.5) mm wide (pressed); phyllaries oblong-lanceolate, in 2–3 series of subequal to unequal length, inner 2–2.5 mm long, midzone linear-oblong, dark-resinous (oil tubes), extending fully to the phyllary apex, apex lance-acute. **Ray flowers** 25–42, corollas 6–7 mm long, white to bluish. **Disc corollas** 1.8–2 mm long. **Achenes** obovate, rarely with a third nerve and wing, 1.8–1.9 mm long, white-margined, awns 1–1.2 mm long.

Flowering August–October (November). Pond sides and depression meadows mostly associated with Carolina bays, lime sinks, ditch banks near bays; 450–650 feet.

Additional collections. Georgia. Jenkins Co.: Ca. 7 mi NW of Millen, Big Dukes Pond Natural Area, S side of pond, from old logging road, scattered in deeper depressions of pond, within graminoid matrix, 22 Sep 2005, *Kruse 05-43* (GA). Screven Co.: no other locality, 1860, *Cleveland s.n.* (FLAS). **North Carolina.** Columbus Co.: Near Old Dock, drainage ditch, 29 Aug 1938, *Godfrey 6337* (DUKE, GH, NCSC, US); SE shore of Lake Waccamaw, at State Park, permanently flooded Carolina Bay, exhibiting fluctuating water levels, little or no exposed shore now, uncommon, with *Luziola fluitans*, *Lachnanthes caroliniana*, *Panicum hemitomum*, *Panicum tenerum*, *Ludwigia sphaerocarpa*, *Rhynchospora chalarocephala*, *R. corniculata*, *Cladium mariscoides*, *Xyris fimbriata*, *Rhexia cubense*, 7 Oct 1994, *Sorrie 8251* (GH). Hoke Co.: 1.4 mi S of Antioch, along E side of Hwy 211 beside Antioch Chapel, with other graminoids and herbs in the bay proper and especially in the bay edge, 9 Oct 1978, *May 767* (NCU); Antioch, Antioch Church Bay, common in water up to 1 ft deep, under pond cypress, 8 Jul 1989, *Sorrie et al. 4757* (NCU); Antioch Church Bay, just E of Hwy 311, 0.6 mi SE of jct of Cope Road (= State Rd 1447), 34.863634 N, 79.19573 W, clay-based Carolina bay, usually ponded in winter and spring, dry with remnant pools in summer and fall, dominant vegetation is well-spaced *Taxodium ascendens* over graminoids and herbs, with shrubs present mostly around the periphery, frequent, with *Rhynchospora careyana*, *Rhynchospora filifolia*, *Polygala cymosa*, *Panicum verrucosum*, *Panicum hemitomum*, *Coelorachis rugosa*, *Xyris smalliana*, *Agalinis linifolia*, *Dichanthelium erectifolium*, *Dichanthelium wrightianum*, 18 Sep 1993, *Sorrie 7706* (NCU). Robeson Co.: Cypress Bay, just S of jct Hwy 1318 and 1370, eastern half of bay, regenerating clearcut inside a clay-based Carolina bay, ca. 20 plants seen, 13 Aug 2008, *LeGrand s.n.* (NCU). Scotland Co.: 6.07 mi NE of Laurinburg, Carolina bay (bordering Hwy 401, W side), open grass-sedge portion of pine-cypress dominated bay, 15 Sep 1978, *Carter 1407* (WEWO). **South Carolina.** Aiken Co.: Savannah River Plant, W of A and N of A2, 33.249942 N, 81.753627 W, wet margin of dry pond, 4

Nov 1966, *Gabrielson 428* (NCU); Monetta Sink, Farm View Road, E of Hwy 39, E side of pond, vegetated flats, 30 Oct 1993, *Hill 25298* (CLEMS, USF); 1.4 mi E of Monetta on Hwy 39, 0.2 mi N of Hwy 266 (near Williams Cemetery), lime sink, 21 Sep 1971, *Massey 2994* (NCU, TENN); SE of Monetta, E side of Hwy 39 near jct with Hwy 266, edges of open, currently rather dry depression meadow within small Carolina bay, 3 Sep 1987, *Nelson 6058* (FSU, USCH); ca. 1 mi W of Monetta, small Carolina bay on W side of Hwy 563 and N side of Hwy 1, occasional in open, drying-down depression meadow, 3 Sep 1987, *Nelson 6063* (FSU, USCH); S side of Monetta, N side of Hwy 266, just E of the jct with Hwy 39, depression meadow within Carolina bay, in ca. 1.5 ft of warm water with a good bit of algae on the surface, scattered with *Panicum*, *Diospyros*, *Eleocharis*, *Stachys*, 25 Aug 1989, *Nelson 8338* (FSU, USCH); S side of Monetta, Carolina bay on N side of Hwy 266, just E of jct with Hwy 39, toward edge of flooded depression meadow, with *Stachys*, *Panicum*, 25 Aug 1989, *Nelson 8339* (FSU, USCH); Aiken, Big Pond, Aug 1885, *Ravenel s.n.* (USCH). Allendale Co.: 7 mi NW of Allendale on Hwy 641, pond banks, 11 Sep 1956, *Bell 5186* (FSU, NCU, USF); Stony Lake E of Allendale and S of jct Hwys 301 and 641, within fairly well-defined zone at edge of depression meadow surrounding open pond within Carolina bay, 24 Aug 1988, *Nelson 6935* (USCH); N side of Stony Lake, just S of Hwy 641 near Hwy 301, edge of drying depression meadow, commonly much-branched ca. halfway up stem, loosely rhizomatous, very abundant, 29 Sep 1988, *Nelson 7074* (FSU-2, USCH-2). Bamberg Co.: 2.5 mi S of Denmark on Hwy 321, ditch, 24 Oct 1957, *Ahles 37590* (NCU). Barnwell Co.: Near Kline, NW side of Hwy 3 and just N of jct with State Road S-80, fairly frequent in drained cypress savanna but most commonly at hwy edge ditch, 3 Oct 1989, *Nelson 8500* (USCH). Beaufort Co.: 0.8 mi S of Yemassee on Hwy 3, savannah, 6 Sep 1956, *Bell 4708* (NCU). Clarendon Co.: Few mi W of Silver, N side of Hwy 224 across from St. Marks Church, frequent along edge of chopped Carolina bay, 4 Oct 1985, *Anderson 8888* (AUA, FSU, USCH); jct of Hwy 14-127 and 14-373, savannah, 10 Sep 1968, *Leonard 1991* (NCU); extensive open depression known as Monkey Bay, 33.54067 N, 80.380672 W, infrequent, usually where bases will remain submersed in all but the driest of weather, with *Sclerolepis uniflora*, *Ranunculus laxicaulis*, *Proserpinaca pectinata*, *Oxypolis canbyi*, *Lobelia boykinii*, *Carex walteriana*, *Hydrolea corymbosa*, 22 Jun 1995, *McMillan 1031* (NCU); W of Silver, N side of Sec Hwy 224 in vicinity of St. Marks Church, edge of dirt road through center of drained, chopped Carolina bay, occasional, 21 Aug 1985, *Nelson 4188* (FSU); just N of St. Marks Church on SW side of Silver, scattered on ditch edge about midway down axis of cleared, timbered (in part) Carolina bay, 14 Sep 1989, *Nelson 8465* (FSU, USCH); [S of Summerton, between Whitlock Rd and Oaks Rd just N of Lake Marion], Monkey Bay, depression meadow, 22 Jun 1995, *Porcher 2446* (CLEMS); 2.3 mi S of St. Paul, savannah, 21 Aug 1957, *Radford 28042* (NCU); 2 mi S of St. Paul, savannah, 21 Aug 1957, *Radford 28145* (NCU); 2.2 mi S of St. Paul, savannah, 19 Oct 1957, *Radford 31023* (NCU). Darlington Co.: NE of Mechanicsville, Great Pee Dee River Heritage Preserve, McCall tract between Byrd's Island and the Great Pee Dee River, 5 Oct 1987, *Swails s.n.* (FMUH). Edgefield Co.: Trenton Lake, 0.6 mi E of jct of Hwy 25 and 29 on Old Plank Road, 33.74028 N, 81.830728 W, shallow margins, rhizomatous, 22 Sep 1971, *Massey 3015* (NCU, UNCC, VSC); Trenton, W side of Hwy 75 and S of RR tracks, toward outer edge of large depression meadow within Carolina Bay, abundant with *Iva*, *Rhexia*, 3 Sep 1987, *Nelson 6101* (FSU); SE side of Trenton near end of Tanks Road, NW side of Hwy 75, grassy depression meadow within largely drained Carolina bay, not many heads opened, 25 Aug 1989, *Nelson 8325* (FSU, USCH); Carolina bay on SE side of Trenton near end of Tanks Road, NW side of State Road S-75, wet part of grassy depression meadow, 25 Aug 1989, *Nelson 8326* (FSU, USCH); State Road S-19-75, 1.1 mi NW of jct with Hwy 19 in Rotalata, margins of large grass-sedge high pond or bay, 24 Aug 1981, *Rayner 1314-1* (USCH). Florence Co.: 2 mi SW of Effingham, jct of Hwy 147 and LRSP Road, open roadside, 26 Sep 1985, *Swails 85/379* and *Swails 85/380* (FMUH). Jasper Co.: 6.9 mi S of Ridgeland on Hwy 17, low pine savannah, 29 Jun 1956, *Ahles 15801* (NCU); 4.8 mi SW of Ridgeland on Hwy 17, pine savannah, 8 Sep 1956, *Ahles 18161* (GH, NCU); few miles NNW of Hardeeville, 0.8 mi SW of jct with Hwy 321 on Rte S-169 (Old Charleston Road) opposite Mt. Cavalry Church, clay loam of depression in open pinewoods with *Pluchea*, *Gratiola*, and *Andropogon*, 5 Oct 1985, *Anderson 8895* (AUA, FSU, USCH); 0.3 mi W of Hwy 321 on Honey Hill Rd (Rte S-203) to Purrysburg Landing, just NNW of Hardeeville. roadside ditch in 1-2 dm water, clay loam of small depression in wet pine flatwoods, 5 Oct 1985, *Anderson 8900* (FSU, LSU-2, USCH); W of S-169, 0.85 mi SW of jct Hwy 321/601 N of Hardeeville, pine-Ctenium savanna, 29 Sep 1984, *Aulbach 2898* (USCH); Jasper State Park, roadside ditch, 14 Nov 1988, *Batson s.n.* (USCH); Jasper State Park, wet clearing, 14 Nov 1988, *Batson s.n.* (USCH); ca.

4 mi NNW of Hardeeville, jct of Hwys 169 and 170, pine savannah, 12 Oct 1974, *Boufford 15840* (GH); just N of Hardeeville, Hwy 17, roadside and pine savannah, 21 Oct 1974, *Boufford 15869* (GH); North Mays section, W of Hwy 321, S of Tillman, wet ditch and savannah at roadside, 26 Jul 1995, *McMillan 1082* (NCU); 4 mi NNW of Hardeeville, jct of Hwys 160-17, pine-savannah, 12 Oct 1974, *Williams 1204* (NCU). Lee Co.: SE of town of Elliott, Carolina bay, N side of Hwy 44 (just NE of the Mt. Pleasant Church), NE of its jct with Hwy 278, frequent but scattered in wet cypress savannah, 4 Oct 1985, *Anderson 8884* (AUA, BRY, FSU-2, GA, LSU-4, SEL); [SE of Elliott], N side of Sect Hwy 44 and just E of Mt. Pleasant Church, NE of jct with Sect Hwy 278, interior of a fairly large Carolina bay, scattered within wet cypress savannah, especially along edges of old ditches, 10 Sep 1985, *Nelson 4275* (FSU); ca. 4.7 mi S of Elliott, Lynchburg Savannah Heritage Preserve, ca. 1.0 mi E of Hwy 527 on Hwy 327, N of road, wetter ecotones between pine savannah and pond cypress savannah, 14 Sep 2000, *Townsend 2354* (CLEMS). Richland Co.: Between Gadsden and Hopkins, just N of Southern Railroad and W of Sec Hwy 2049, around edges of drying central area of Carolina bay, now used as pig pen and cattle wallow, with *Stachys hyssopifolia*, 11 Sep 1984, *Nelson 3701* (FSU, USCH). Saluda Co.: ca. 3 mi NE of Monetta, Hibernia, W side of Hwy 23, Highland Pond (northern Saluda County High Pond, SW corner of pond at powerline crossing, ca. 640 ft, sandy soil, infrequent in *Eleocharis* flats, 4 Sep 1992, *Hill 24200* (CLEMS, GH); just N of Monetta, W side of Hwy 23, wet edge of small Carolina bay dominated by flooded depression meadow, occasional, 3 Sep 1987, *Nelson 6085* (FSU); just NE of Monetta and N of Hwy 23 on the W side of Hwy 284, edges of square irrigation? pond near edge of extensive peach orchard, 25 Aug 1989, *Nelson 8334* (DUKE, FSU, USCH); ca. 0.9 mi W of central Ridge Springs, E side of Hwy 23 at RR tracks, highly altered depression meadow within Carolina bay, 25 Aug 1989, *Nelson 8341* (FSU, USCH); 1 mi WSW of Ward [on Hwy 23], meadow, 12 Oct 1957, *Radford 30357* (NCU, VDB); ca. 1.1 mi N 10° E of the jct of Sec Road 284 and Hwy 23 in Hibernia, grass-sedge dominated, wet, central area within generally forested wet depression (Carolina bay) at N margin of open, central area, 11 Aug 1981, *Rayner s.n.* (USCH). Sumter Co.: Just SW of Cane Savannah, W side of Hwy 40, depression meadow in Carolina bay, infrequent, scattered with *Panicum hemitomon*, *Stachys hyssopifolia*, 14 Sep 1989, *Nelson 8457* (NCU). Williamsburg Co.: Ca. 1 mi W of downtown Gourdin, N side of Hwy 375, edge of fallow field, infrequent, 11 Sep 1986, *Nelson 4690* (FSU); 4 mi S of Lane off S-16, Line Road on S part of Venture Plantation, along wet ditch, 15 Sep 1989, *Nelson 8467* (USCH); Scottswood Plantation [SE of Lane], 100 yds due S of a dirt road, 1.35 mi E along first dirt road to E off the Canal Rd from the jct just S of the maintenance shed, within small cypress dome, 24 Oct 1984, *Rayner 2080* (USCH).

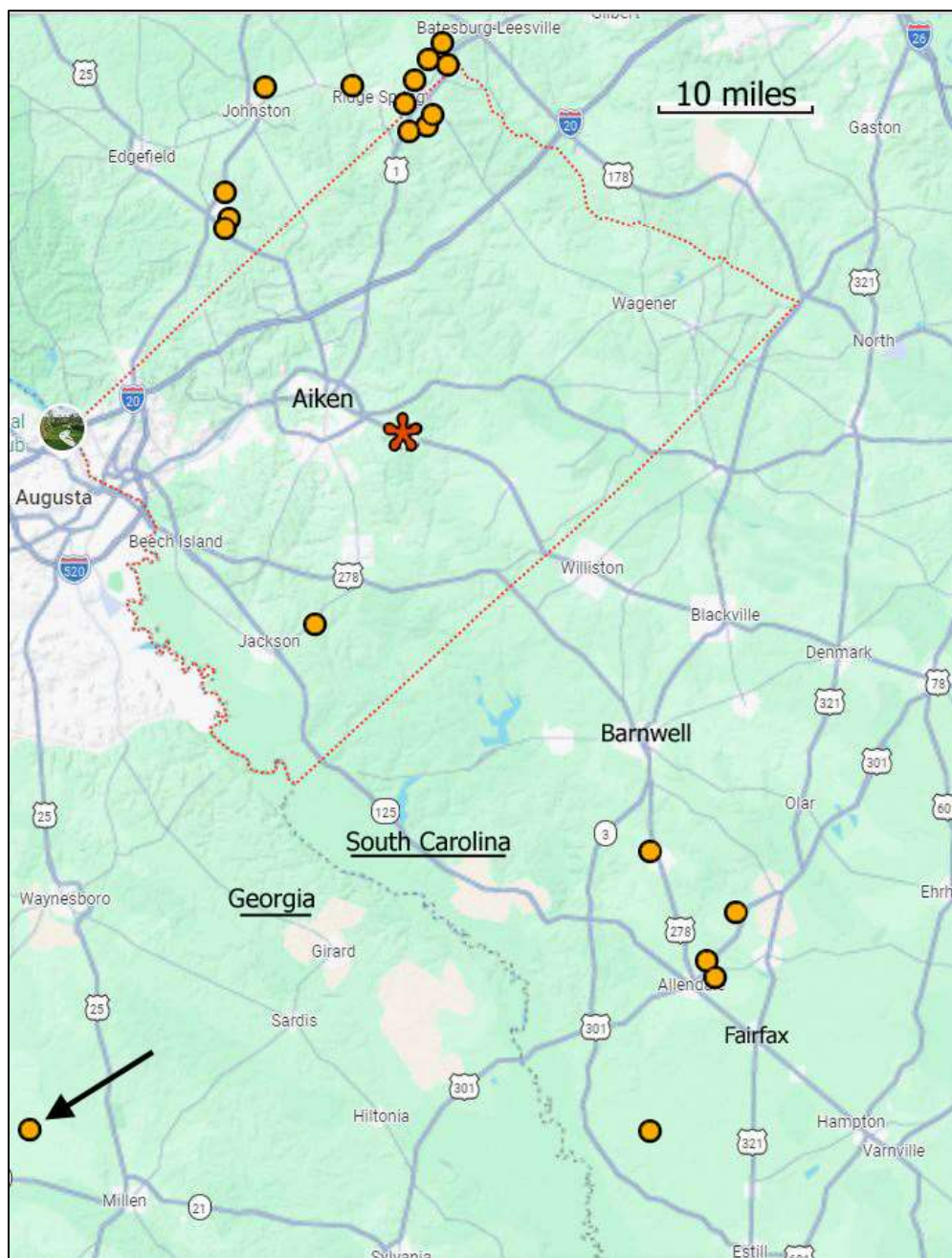
BOLTONIA ANNUA Nesom, **sp. nov.** **TYPE:** **South Carolina.** Aiken Co.: Montmorenci, savannah-like area, 16 Sep 1961, *H.E. Ahles 55071* (holotype: NCU-8426; isotypes: APSC, AUA, BOON, CLEMS, CM, COLO, CONV, ECUH, ERSK, FLAS, FSU, FSUH, FUGR, GA, GAS, GH, IND, KANU, MISS, MUR, NCU-8425, NDA, PAC, SIU, TENN, UNCC, USCH, USF, USMS, VDB, VSC, WCUH, WILLI, WWC-2). In the set of specimens comprising the type collection, at least 56 individual plants are included.

Similar to *Boltonia ellipsium* in geography and Carolina bay habitat, different in its production of short basal offsets (vs. long rhizomes), narrower leaves (1.5–2.5 mm wide vs. 6–11 mm), and corymboid inflorescence with divaricate peduncles (vs. mostly paniculate with peduncles acute-ascending), smaller heads with fewer rays, and awnless achenes. Similar to *B. diffusa* in its short duration and long and bracteate peduncles but clearly annual (vs. flowering the first year), phyllaries equal to subequal in length, and achenes smaller without broad wings and pappus awns. Known only from the type collection.

Herbaceous annuals, taprooted or fibrous-rooted, glabrous, often with basal offsets 1–12 mm long, producing a tuft of small leaves and new stem at the apex. **Stems** 50–70 cm, erect, 1-numerous from the base. **Leaves:** basal absent at flowering; lower and midcauline linear-lanceolate, 2–3.5 cm long, 1.5–2.5 mm wide, relatively even-sized up to the inflorescence, then becoming bracteate. **Inflorescence** diffusely corymboid, heads solitary or usually on divaricate peduncles 2.5–5 cm long, peduncles mostly with 1–3 minute bracts. **Involucres** 4–5.5 mm wide (pressed); phyllaries narrowly oblong, in 2(–3) series of equal to subequal length, inner 2–2.5 mm long, with a dark, orange-resinous (oil tube), linear-oblong extending fully to the phyllary apex, apex lance-acute, **Ray flowers** ca. 20–28,

corollas 6–7 mm long. **Disc corollas** 1.8 mm long. **Achenes** obtriangular-obovate, 1.6–1.8 mm long, white-margined, sometimes 3-nerved and 3-winged, wholly rimmed by a filiform oil tube, awns absent or ca. 0.1 mm long.

Ahles made other collections of wetland species at the same locality on 16 September 1961; further Ahles collections on 10 Jun 1962 were labeled as "Montmorenci, disturbed savannah-like area." John Nelson in 1989 and 1990 made collections of various species from "N edge of Montmorenci, devastated, drained Carolina Bay on N side of US 78" and "E side of US 78 in downtown Montmorenci, ... drained, partially plowed Carolina bay." The locality is shown in Figures 1 and 2.



Map 2. Distribution of *Boltonia ellipsium* and *B. annua* in Aiken, Allendale, Barnwell, Edgefield, and Saluda counties, South Carolina. Aiken County is outlined in red. Arrow points to locality of the only known collection from Georgia, Kruse 05-43 (Jenkins County).



Figure 1. Probable location of *Boltonia annua* collection in Montmorenci, South Carolina. Google Earth image from 1985 — the most recent Google Earth image (Feb 2022) shows the area little modified from earlier. Arrow shows the point of the Street View map in Figure 2.



Figure 2. Probable location of *Boltonia annua* collection in Montmorenci, South Carolina. Google Street View from October 2025.

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Figure 3. *Boltonia ellipsium*. Allendale Co., South Carolina, Radford 11420 (CHRB).



Figure 4. *Boltonia ellipsium*. Allendale Co., South Carolina, Radford 11420 (WCUH).



Figure 5. *Boltonia ellipsium*. Allendale Co., South Carolina, Nelson 6935 (USCH).

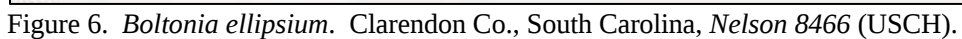


Figure 6. *Boltonia ellipsium*. Clarendon Co., South Carolina, Nelson 8466 (USCH).



Figure 7. *Boltonia ellipsium*. Clarendon Co., South Carolina, Anderson 8888 (USCH).



Figure 8. *Boltonia ellipsium*. Fibrous roots and rhizomes, representative plant.



Figure 9. *Boltonia ellipsium*. Fibrous roots and rhizomes, representative plant.



Figure 10. *Boltonia ellipsium*. Fibrous roots and rhizomes, representative plant.



Figure 11. *Boltonia ellipsium*. Fibrous roots and rhizomes, representative plant.



Figure 12. *Boltonia annua*. Isotype (CLEMS). Three plants.

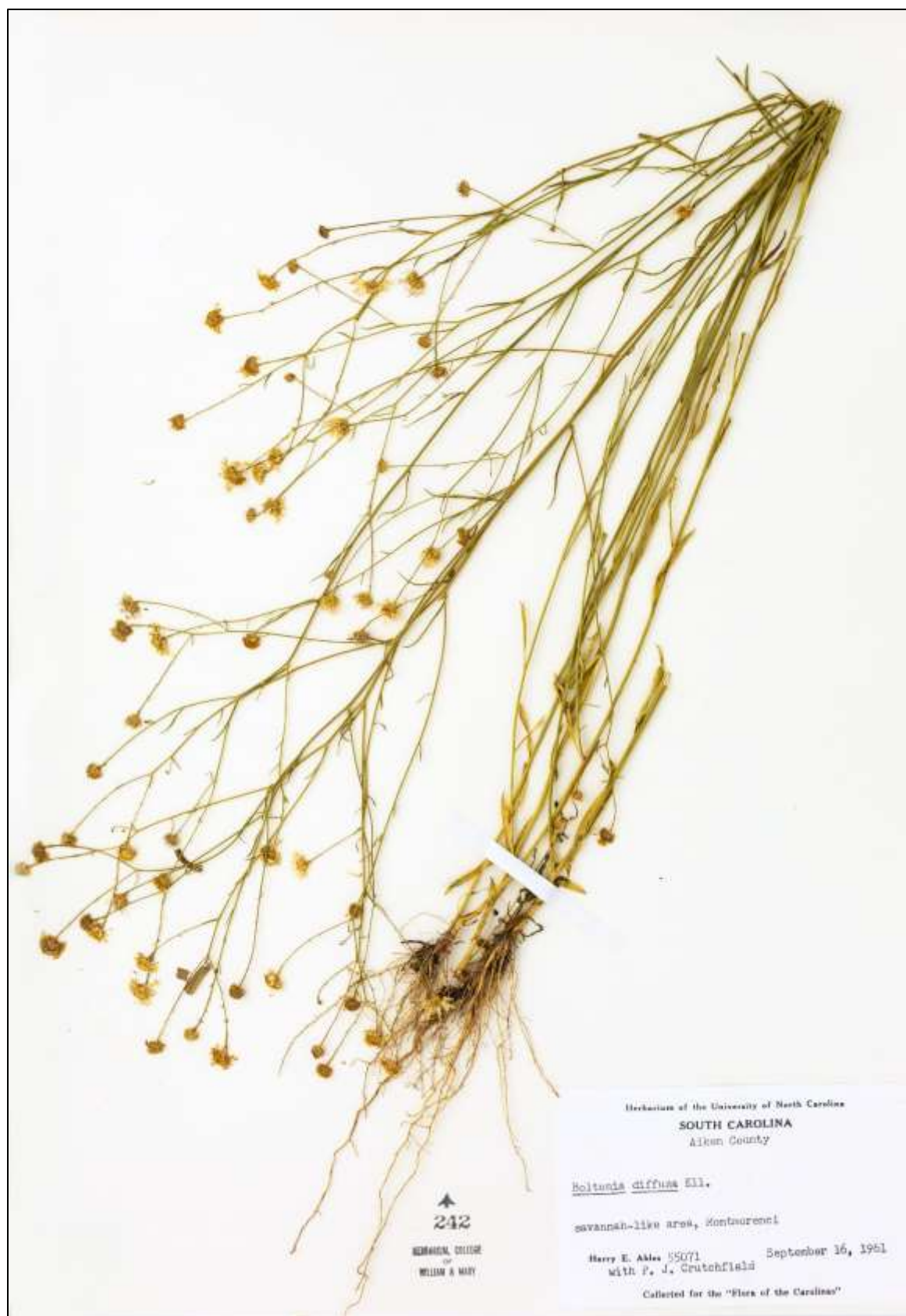


Figure 13. *Boltonia annua*. Isotype (WILLI). Three plants.



Figure 14. *Boltonia annua*. Detail from isotype (CLEMS). Roots of three separate plants.



Figure 15. *Boltonia annua*. Holotype (NCU). The largest plant among those of the type collection.



Figure 16. *Boltonia annua*. Detail from holotype (NCU). Roots of one multi-stemmed plant.