

A NEW HEDGE-NETTLE (STACHYS: LAMIACEAE)
FROM SOUTH CAROLINA, U.S.A.

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ABSTRACT

A distinctive and geographically restricted species of *Stachys*, *S. caroliniana* (Lamiaceae), or “hedge-nettle,” is described from South Carolina, as a member of the flora of the Coastal Plain of the southeastern U.S.A.

RESUMEN

Se describe del Carolina del Sur una especie distinta restringida geográficamente de *Stachys*, *S. caroliniana* (Lamiaceae), o “hedge-nettle,” como miembro de la flora de la Llanura Costera de sureste de Estados Unidos.

Stachys is one of the larger genera of the subfamily Lamioidae within the Lamiaceae, encompassing nearly 300 species, and with a nearly cosmopolitan distribution, absent from Australia and the western Pacific (Epling 1934; Nelson 1981; Mulligan & Munro 1989). Its centers of species diversity include warm-temperate portions of western Asia and the Mediterranean, southern Africa, and portions of North and South America (İlçim et al. 2008). The genus in North America, north of Mexico, contains about 45 species, with species particularly concentrated west of the Rocky Mountains (especially in the Pacific states) and in the east along the Atlantic seaboard states and Appalachian region. Southeastern species occur in a wide variety of habitats, most often in mesic sites or wetlands, and at a wide variety of regional elevations. An additional species, known only from the Santee River delta of South Carolina, deserves recognition.

Stachys caroliniana J.B. Nelson & D.A. Rayner, sp. nov. (**Figs. 1–7**). TYPE: UNITED STATES. SOUTH CAROLINA. Georgetown Co.: grassy margin of freshwater pond, Cat Island, Tom Yawkey Wildlife Center, 7 Jul 2005, J.B. Nelson 25466 (HOLOTYPE: USCH; ISOTYPES: BRIT, CLEMS, FSU, GH, NBYC, NCU, NY, US).

Stachys caroliniana differs from *S. pilosa*, *S. arenicola*, and *S. aspera* in having only short, dense stem pubescence on both stems sides and angles, the hairs of uniform size; in having shorter calyx lobes; and in having nearly white corollas.

Perennial **herbs**, with fibrous roots from pale, shallow rhizomes; **stems** strictly erect, to 0.5 m tall, scarcely branched except occasionally at lowest node of inflorescence (unless injured), the angles copiously short-hairy with stiff, short, reflexed or somewhat spreading hairs, the sides similarly pubescent, and also with rare, nearly sessile glandular hairs which become progressively more abundant upward; nodes slightly bearded; **leaves** nearly sessile, or the most basal, or largest midstem leaves with short petioles 2–5 mm; midstem leaves generally the largest, the blades 1–2(–2.5) cm broad, 2.5–6(–8) cm long; rounded to truncate at base, the lowest blades prominently obtuse-rounded apically, then progressively more acute distally along the stem; blades lanceolate, lance-elliptic; leaves spreading, upper surface abundantly pubescent or scaberulous with appressed non-glandular hairs, the hairs up to 1.5 mm, sharply pointed, uniformly distributed across the surface, the upper surface dark green, tending toward a dark bluish-green, especially in shade plants, or with an ashy-green appearance; lower surface pale green, copiously pubescent with erect, soft, sharp-pointed hairs to 1 mm, thus soft and “felty,” the foliage when crushed without any particular fragrance; **inflorescence** a series of interrupted verticils, commonly elongated with age; **bracts** rapidly reduced upward from lowest fertile node (or in very robust flowering plants, more gradually reduced), the lowest bracts lanceolate, progressively trullate to ovate, pubescent with eglandular and glandular hairs; **axillary cymules** each with 3 flowers, the verticils thus



Fig. 1. Flowering stems of *Stachys caroliniana*. Photo by Jim Fowler.



FIG. 2. Open flowers at a single node of *Stachys caroliniana*. Photo by Jim Fowler.

6-flowered; bracteoles narrow, spinulose, glandular and pubescent, 0.5–0.8 mm long; flowers perfect and fertile; **calyx** campanulate, densely short-soft pubescent, with abundant delicate, stipitate glands; fruiting calyx 5.5–7 mm long, the tube (to base of lobe sinus) 3.5–4 mm, the lobes 2–3 mm; lobes abundantly hairy with eglandular and stipitate glands, especially along veins, deltoid to lanceolate, mostly $\frac{1}{2}$ the length of the tubes, each lobe terminated by a pale apiculum; **corolla** tubular and galeate, from base to galea apex 13 mm long at full anthesis; corolla tube prominently saccate toward base on lower side, internally glabrous, but with prominently slanting (oblique) annulus, copiously pubescent with soft, bulbous trichomes; corollas white, scarcely pinkish, save for scattered spots on lower lip, the lower corolla lip declined up to 90° from tube, to 7 mm long, the central lobe nearly rotund, 4–5.5(–6) mm broad; filaments pink, with short, capitate glands as well as bulbous trichomes; **mericarps** 1–1.2 mm broad, 1.6–1.8 mm long, dark brown, minutely pebbled.

Additional collections examined: **UNITED STATES. South Carolina: Georgetown Co.:** first collection from type locality, 22 Jun 1990, J.B. Nelson 9256 (USCH); same locality, 12 Aug 1993, J.B. Nelson 14649 with C.N. Horn (USCH). **Charleston Co.:** Santee Coastal Reserve, along old rice canal, 10 Aug 1977, D.A. Rayner 1011 (USCH).

The first known collection of this plant is from Charleston County, South Carolina, on the south side of the Santee River within the Santee Coastal Reserve, collected by D.A. Rayner (1011, USCH 20756) in 1977, a unicate, which remained a questionable collection of *Stachys aspera* Michx. (as *Stachys hyssopifolia* Michx. var. *ambigua* Gray) for some time. The Santee Coastal Reserve is an extensively managed, large holding of land (nearly 24,000 acres) owned and administered by the South Carolina Department of Natural Resources (SCDNR). For decades, this property has been managed dynamically for wildlife habitat, although its 18th–19th Century history was devoted in considerable part to rice culture. The original population was located between pine



FIG. 3. Flowers in early fruit of *Stachys caroliniana*. Photo by Jim Fowler.

flatwoods and a freshwater marsh; this population has not been seen since its first collection. The same plant was collected again in 1990 in Georgetown County, in its only other known locality (the type locality), approximately 8 air miles (13 km) to the northeast of the first collection, this on the north side of the Santee River. This second site is 10.4 air miles (17 km) south of the city of Georgetown on the west-central part of Cat Island, within the Tom Yawkey Wildlife Center, also managed for wildlife by SCDNR, in Georgetown County (Nelson 2002). The site of the type collection is barely 0.4 miles (about 600 m) east of the Intracoastal Waterway. The Yawkey Center collection is in habitat similar to that of the Charleston County population, along the south side of the Santee River. [The watershed of the Santee River effectively drains nearly half of South Carolina: a common misconception is that the Savannah River is the major river system of South Carolina, when in fact its watershed is much more important—biologically and culturally—in neighboring Georgia (Edgar 1998)].

This taxon is instantly differentiated from all other taxa in the southeastern U.S.A. by its dense, short, uniform stem pubescence, its relatively short calyx lobes, and its white corollas. The other species of *Stachys*



FIG. 4. Midstem leaves and stem of *Stachys caroliniana*. Photo by Jim Fowler.

known to occur in Charleston and Georgetown counties are the two relatively uncommon natives *S. aspera* and *S. tenuifolia*, as well as the widespread and weedy *S. floridana*. These three sympatric taxa, as well as others, are discussed below.

Stachys aspera Michx. is a wide-ranging species, from northern Florida north into Maryland, and including scattered sites in the upper Midwest, and as far south as Missouri. The type (P!) was presumably collected by Andre Michaux in Charleston County, within which modern locations are still known (e.g., *Nelson 10849*, USCH, collected 25 Jul 2001, which incidentally agrees well with the type at P) as well as slightly more distant counties (e.g., Dorchester, *Nelson 25149*; Berkeley, *Nelson 30626*, *Porcher 2457b*; Colleton, *Bourgeois s.n.*, July 2009, all USCH). *Stachys aspera* is a potentially tall (stems over 1 m, although usually much shorter) perennial, the stems commonly sprawling and supported by other vegetation. Its stems are typically glabrous on the sides, with glabrate to hispid angles. Its leaves are generally lanceolate to narrowly elliptic and although hairy (glabrate to hispidulous/hispid), are never soft and felt-like to the touch. Its corollas are pink. The mature calyx lobes tend to be straight or barely spreading. Although distinctive in South Carolina, *S. aspera* is clearly related to *S. hispida* Pursh from farther north. The separation of these two taxa throughout their range is not straightforward, and there is some discussion concerning their conspecificity.

Stachys tenuifolia is an even more widespread species, known on the Coastal Plain from the Gulf Coast (eastern Texas) to New Jersey, most commonly in considerable shade along river bottoms along the lower Mississippi and its upper tributaries, well into Arkansas, Oklahoma, Missouri, Iowa, Illinois, Indiana, Ohio,



FIG. 5. Habitat at type locality of *Stachys caroliniana*, John Cely pictured. Photo by John Nelson.

and West Virginia and is known additionally from a number of upland, “interior” sites. This is a variable taxon, most often with glabrous/glabrate stems, these not infrequently slightly retrorse-hispidulous. This taxon always features prominently petioled leaves with blades which are lanceolate or elliptical, and usually with strongly serrated margins, with the plants commonly branching well below the first fertile node. Its corollas are distinctly pink. Calyx lobes of *S. tenuifolia*, in fruit, are commonly curled backward. *Stachys tenuifolia* has also been regarded as a near relative of *S. hispida*, the two taxa sometimes intergrading (Cooperrider & Sabo 1969).

Stachys floridana similarly has pink corollas, as well as prominently petioled leaves which are crenate (to serrate) on the blade margins, and commonly cordate at the base. Plants commonly produce crisp, somewhat swollen, bulbous, moniliform rhizomes (which are edible). This is the earliest-flowering perennial species known in the southeastern U.S.A., sometimes blooming in early April on the Coastal Plain of South Carolina, and has earned considerable notoriety as an aggressive weed. Above-ground short systems commonly senesce and die by early June, normally disappearing entirely by late summer.

There is no question that the plant from Charleston and Georgetown Counties, South Carolina, is distinctive from all other commonly known southeastern taxa. The only other possibility of close taxonomic relationships involves those with *Stachys pilosa* Nuttall and *Stachys arenicola* Britton, the ranges of which are considerably far removed from *S. caroliniana*.

Stachys pilosa is an extremely variable and softly hairy plant, occurring from Ontario into much of the American Midwest, which surely represents the broadest distribution of any North American *Stachys*; it is not a part of the flora of the southeastern U.S.A. Its stems feature long, spreading hairs on the angles and usually at

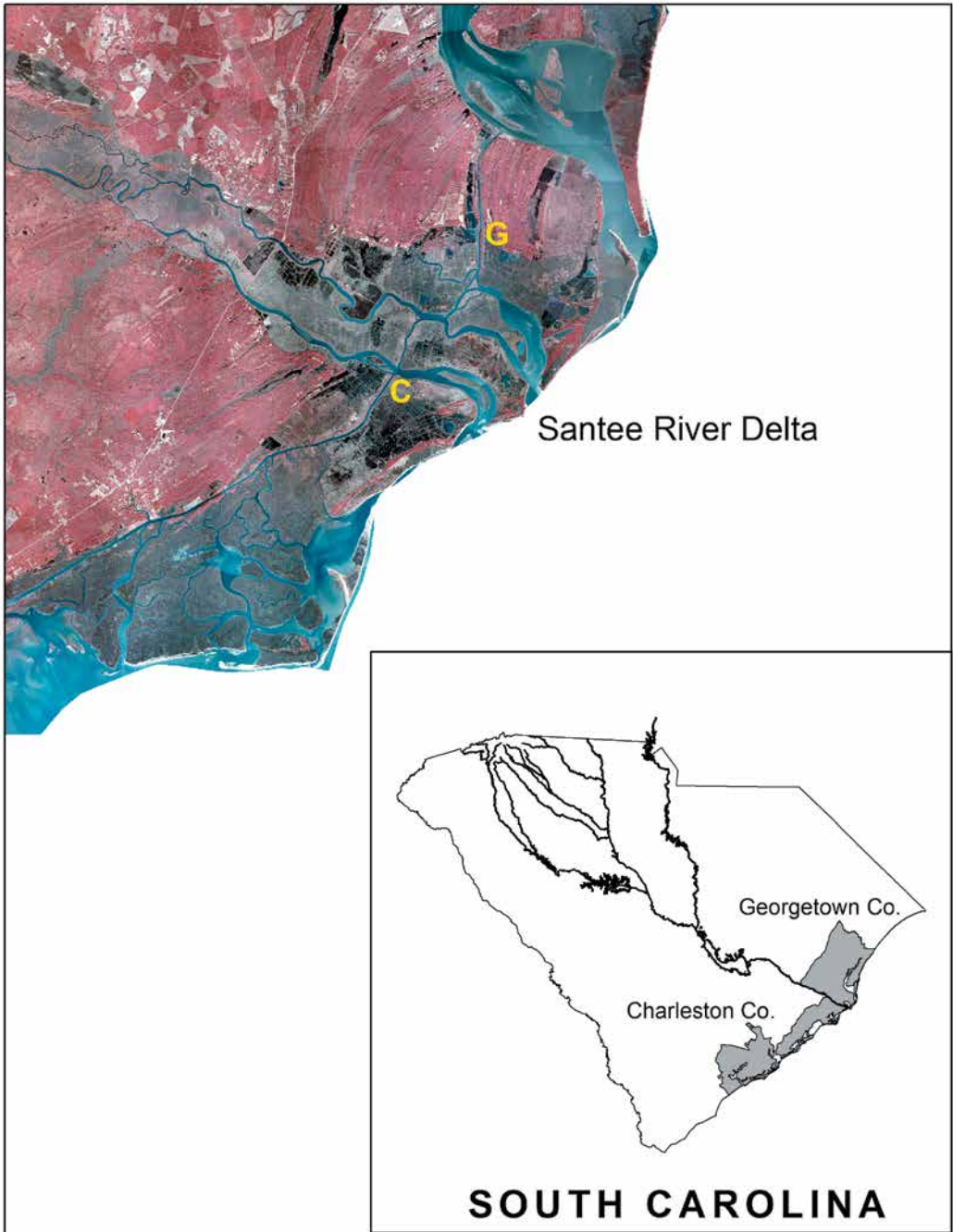


Fig. 6. Location of known populations of *Stachys caroliniana*. G = Georgetown County (type locality), C = Charleston County, Rayner collection (approximate). Inset map indicates borders of South Carolina, Georgetown County, Charleston County, and the drainage of the Santee River.



Fig. 7. Holotype of *Stachys caroliniana* (Nelson 25466).

least a “subcanopy” of glandular and eglandular hairs on the sides, commonly forming a two-tiered appearance. *Stachys pilosa* has pink corollas, featuring a lance-oblong lower lip commonly notched distally.

Stachys arenicola, similarly with pink corollas, was described by Britton from plants with coarsely scabrous stems and foliage, the stems featuring both coarse and fine eglandular hairs, these predominantly downwardly angled, on the angles as well as the sides. Its southernmost occurrences are apparently in Virginia (Prince William County, *Fleming 7164, 13408, 13414* [USCH]; Frederick County, *Nelson 13174* USCH).

Stachys pilosa, as widespread as it is and as a frequent resident of wet prairies, could conceivably be transported by waterfowl along migratory flyways from more northern sites into the Southeast; the same is at least marginally true for *Stachys arenicola*. And, the South Carolina sites discussed so far within this article have historically had heavy visitation by migratory waterfowl. *Stachys caroliniana*, however, is narrowly restricted in its range and apparently so differentiated morphologically that its conspecific status with either *S. pilosa* or *S. arenicola* is most unlikely.

KEY TO *STACHYS CAROLINIANA* AND ITS GEOGRAPHIC AND MORPHOLOGIC RELATIVES

1. Leaves with well-developed petioles $\frac{1}{2}$ (or longer) the length of the blade; summer or spring-blooming.
 2. Plants with slender rhizomes; stem side glabrous (rarely glabrate); stem angles glabrate (rarely hairier); blade bases rounded; calyx glabrous to hispidulous, without glandular hairs; summer blooming _____ ***S. tenuifolia***
 2. Plants with swollen, crisp, moniliform tubers; stem angles hispidulous to hirsute with reflexed hairs; blade base truncate to cordate; calyx abundantly pubescent with glandular and eglandular hairs; spring blooming _____ ***S. floridana***
1. Leaves sessile or with petioles less than $\frac{1}{2}$ length of blade; summer blooming.
 3. Stem sides glabrous (to glabrescent) _____ ***S. aspera***
 3. Stem sides abundantly pubescent, tomentulose, hispidulous, or hispid.
 4. Corollas pink; calyx lobes $\frac{1}{2}$ the length of calyx tube; lower leaf blades acute-acuminate; lower lip of corolla ovate to lance-ovate; VA and north.
 5. Leaf blades elliptic; hairs of stem angles and sides spreading, with stipitate glands on sides _____ ***S. pilosa***
 5. Leaf blades lanceolate; hairs of stem angles and sides retrorse (spreading), without stipitate glands _____ ***S. arenicola***
 4. Corollas white; calyx lobes $< \frac{1}{2}$ length of calyx tube; lower leaf blades obtuse; lower lip of corolla rotund-ovate; endemic to SC _____ ***S. caroliniana***

In spite of the large amount of acreage along the Atlantic Seaboard (New York to Florida) which more or less duplicates landscape features of the Santee River delta in South Carolina, no other collections of this hedge-nettle are known: indeed, its morphology is distinctive and unique. Despite the relatively high amount of botanical interest in and around this area, both historic and recent, only two collections—and populations—are known. The two populations are apparently from presumably similar habitats, and they are relatively near each other. They are not weedy plants and not represented from other places by known herbarium collections. *Stachys caroliniana* is here proposed as occurring in relict populations and should be considered very rare and probably in danger of extinction.

Etymology.—Known only from South Carolina, the epithet “*caroliniana*” is chosen to reflect its natural and only known home to date.

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