NEW COMBINATIONS, RANK CHANGES, AND NOMENCLATURAL AND TAXONOMIC COMMENTS IN THE VASCULAR FLORA OF THE SOUTHEASTERN UNITED STATES

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ABSTRACT

We make generic transfers and rank changes of taxa distributed primarily in the southeastern United States. These include transfers from *Prenanthes* to *Nabalus* (Asteraceae or Compositae), from *Senecio* to *Packera* (Asteraceae or Compositae), from *Onosmodium* to *Lithospermum* (Boraginaceae), from *Trichomanes* to *Crepidomanes* (Hymenophyllaceae), from *Osmanthus* to *Cartrema* (Oleaceae), from *Thelypteris* to *Stegnogramma* (Thelypteridaceae), from *Panicum* to *Coleataenia* (Poaceae or Gramineae), from *Panicum* to *Dichanthelium* (Poaceae or Gramineae), and from *Vitis* to *Muscadinia* (Vitaceae), as well as making rank changes involving taxa in *Viburnum* (Adoxaceae), *Hypericum* (Hypericaceae), *Spigelia* (Loganiaceae), *Andropogon* (Poaceae or Gramineae), and *Leptochloa* (Poaceae or Gramineae). New names are proposed in *Coreopsis* (Asteraceae or Compositae) and *Lithospermum* (Boraginaceae). We additionally discuss the taxonomy and appropriate rank of additional taxa not requiring new combinations in many of these genera, based on recent herbarium and field studies.

RESUMEN

Hacemos transferencias genéricas y cambios de rango de taxa distribuidos primariamente en el suroeste de los Estados Unidos. Esto incluye transferencias de *Prenanthes* a *Nabalus* (Asteraceae o Compositae), de *Senecio* a *Packera* (Asteraceae o Compositae), de *Onosmodium* a *Lithospermum* (Boraginaceae), de *Trichomanes* a *Crepidomanes* (Hymenophyllaceae), de *Osmanthus* a *Cartrema* (Oleaceae), de *Thelypteris* a *Stegnogramma* (Thelypteridaceae), de *Panicum* a *Coleataenia* (Poaceae o Gramineae), de *Panicum* a *Dichanthelium* (Poaceae o Gramineae), y de *Vitis* a *Muscadinia* (Vitaceae), así como hacer cambios de rango que implican a taxa de *Viburnum* (Adoxaceae), *Hypericum* (Hypericaceae), *Spigelia* (Loganiaceae), *Andropogon* (Poaceae o Gramineae), and *Leptochloa* (Poaceae o Gramineae). Se proponen nuevos nombres en *Coreopsis* (Asteraceae o Compositae) y *Lithospermum* (Boraginaceae). Además discutimos la taxonomía y el rango apropiado de taxa adicionales que no requieren nuevas combinaciones en muchos de estos géneros, basados en estudios recientes de herbario y de campo.

In preparation for the publication of a new state flora, the *Flora of Virginia* (Weakley, Ludwig, & Townsend, in prep.) and a new regional flora for a large portion of the southeastern United States, the *Flora of the Southern and Mid-Atlantic States* (Weakley, in prep.; Weakley 2011), as well as for general floristic, conservation, and scientific work in eastern North America, it is necessary to make a number of new combinations to accurately reflect current taxonomic understanding. Some of these changes are rank changes, while others are generic transfers

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to allow use of new (or re-adoption of old) generic concepts that are not fully reflected in available nomenclature at the specific or infraspecific levels.

ADOXACEAE

VIBURNUM

A reassessment of the *V. dentatum* group (Sorrie 2010) has resulted in the resurrection to specific rank of four taxa formerly much synonymized or "varietized" within *V. dentatum*: *V. scabrellum* (Torr. & A. Gray) Chapm. [= *V. semitomentosum* (Michx.) Rehder], *V. carolinianum* Ashe, *V. alabamense* (McAtee) Sorrie [see below], and *V. venosum* Britton (Sorrie & Weakley 2011). All of these species are marked by highly distinct morphology and ranges and by little or no evidence of hybridization. Ironically, the segregate that has been most often recognized as a species or variety, *V. recognitum* Fernald (= *V. dentatum* var. *lucidum* Aiton), is morphologically the least distinctive component of the complex and may not warrant recognition at species rank. Pending further study, we retain *V. recognitum* at species rank, as its relative relationships to *V. dentatum* sensu stricto and other entities in the complex remain unclear.

Except for McAtee's monograph (1956), *Viburnum carolinianum* W.W. Ashe (Ashe 1918) has gone unrecognized for nearly a century; most authors subsuming it under *V. dentatum* L. The characters that separate *V. carolinianum*—uniformly large and rotund leaves, dense tomentum of stellate hairs on leaf undersides, stellate inflorescence branches, and strictly montane range—appear to be constant (31 specimens at NCU). *Viburnum carolinianum* slightly overlaps with *V. dentatum* sensu stricto in a few western NC counties, and the two maintain their succinct differences. We regard this as a distinct and relictual species, occupying a range of habitats, from river- and creek-banks to dry upland forests and granite outcrop edges. *Viburnum carolinianum* is a Southern Appalachian endemic, restricted to eastern Tennessee (Blount, Jefferson, and Polk counties), western North Carolina (11 counties), and northeastern Georgia (Rabun, Towns, Union, and White counties), a distribution very similar to that of many other "southern end of the Southern Blue Ridge" endemics (Weakley et al. in prep.).

A *Viburnum* entity from Alabama was originally named *V. recognitum* Fern. var. *alabamense* McAtee (McAtee 1953). McAtee maintained this disposition in a later monograph of the North American taxa (McAtee 1956). This taxon has generally been ignored since, but recent herbarium studies suggest that it is distinct from its relatives and warrants recognition. Taxon "*alabamense*" possesses the rotund-ovate leaf shape and stellate petiole characters of *V. dentatum*, and shares most inflorescence, flower, and fruit size and shape with both *V. dentatum* and *V. recognitum*. However, taxon "*alabamense*" has a few characters that strongly diverge from both *V. dentatum* and *V. recognitum*: stipitate-glandular cymes (vs. absence of stipitate hairs), cyme nodes and branches with simple hairs (vs. glabrous or with a few scattered stellate hairs), and fruits with densely glandular surfaces (vs. glabrous), warranting in our opinion elevated taxonomic rank. Taxon "*alabamense*" is apparently restricted to the Lookout Mountain region of northeastern Alabama in Cullman, DeKalb, and Marshall Counties (five specimens at NCU), approximately 240 km disjunct from the nearest populations of *V. dentatum* in eastern Georgia and western South Carolina. The Lookout Mountain area is otherwise known for some narrow endemics, and the narrow restriction of the taxon "*alabamense*" indicates that it warrants a level of conservation concern. In order to provide recognition of taxon "*alabamense*" at the species rank, a new combination is proposed.

Viburnum alabamense (McAtee) Sorrie, comb. et stat. nov. BASIONYM: *Viburnum recognitum* Fernald var. *alabamense* McAtee; Bull. Nat. Hist. Surv. Chicago Acad. Sci. 123:2. 1953. TYPE: U.S.A. ALABAMA. DeKalb Co.: low rocky east bank of west fork of Little River, near State Park on Lookout Mountain, 22 May 1942, *R.M. Harper* 3883 (GH).

Additional specimens cited: **U.S.A. ALABAMA. Cullman Co.:** rocky and alluvial woods, Mulberry Branch of Black Warrior River, N of U.S. 278 bridge, 28 Jun 1966, *R.C. Clark 3920* (NCU). **DEKALB CO.:** Valleyhead, 26 Jun 1918, *T.G. Harbison 4514* (NCU); Little River Canyon, De Soto State Park, 7 Aug 1975, *D. Demaree 52779* (NCU). **MARSHALL CO.:** near Town Creek on Sand Mountain, 26 May 1899, *Biltmore Herb. 1068d* (NCU); near highway 39 along Big Reedbreak Creek, SW of Douglas, floodplain over sandstone at base of sandstone bluff, 2 Aug 1974, *R.D. Whetstone 3260 with Atkinson and Springer* (NCU).

ASTERACEAE OR COMPOSITAE

COREOPSIS

Since its naming (Beadle 1898), the interpretation of *Coreopsis helianthoides* Beadle has varied, intermittently accepted as a good taxon but often lumped as a component of *C. gladiata* Walter. However, the "*helianthoides*" entity is highly distinctive from *C. gladiata*, its salient features under-appreciated by practically all authors except Ahles (1968). A few other authors have maintained it as a "good" taxon (Small 1933; Cronquist 1980, though his stated distribution is incorrect and apparently includes erroneously identified material), while most recent authors have explicitly or tacitly included it within *C. gladiata* (Smith 1976, 1983; Godfrey & Wooten 1981; Wunderlin & Hansen 2011; Duncan & Kartesz 1981; Jansen, Smith, & Crawford 1987; Strother in FNA (2006). Aside from its leaf arrangement, habit, and habitat, it is notable for the very broad achene wings relative to body width and for the short achene awns (average 0.8 mm). "*Coreopsis helianthoides*" often grows semiprostrate or with ascending stems, perhaps due to relatively frequent inundation. Of the species in this group, only "*C. helianthoides*" and *C. integrifolia* inhabit communities that are subject to river or stream overflow. "*Coreopsis helianthoides*" inhabits swamp forests and openings, fresh-tidal creek margins, marshes, and borrow ponds. It ranges near the coast from southeastern North Carolina to northeastern Florida (Duval County, where last collected in 1898). Georgia specimens of "*C. helianthoides*" are very rare—e.g., Camden County, 1 mile north of Kingsland, 18 Oct 1950, *R.K. Godfrey* 50908 (FSU, NCSC). Flowering dates are from mid-August to late October.

The confusion in this complex is underlined by the fact that Beadle's designated type for *Coreopsis helianthoides*—Aspalaga, Florida, Oct 1897, *A.W. Chapman s.n.* (holotype: Biltmore Herb., probably destroyed; isotypes MO!, US!)—is actually a specimen of *C. gladiata* Walter sensu stricto. It has broad-bladed leaves at all basal and lower culm nodes and was collected hundreds of kilometers outside of the known range of the "*helianthoides*" entity. Since the name *C. helianthoides* Beadle is thus a heterotypic synonym of the earlier *C. gladiata* Walter and there is no other existing name which applies to the species that has been interpreted as *C. helianthoides*, the species is described here with a new name and type that correctly describes these plants.

Coreopsis palustris Sorrie, sp. nov. (**Fig. 1**). TYPE: U.S.A. NORTH CAROLINA. Brunswick Co.: clearing bordering swamp forest and on stream bank, Bell Swamp near Winnabow, 27 Oct 1950, *R.K. Godfrey* 50957 (HOLOTYPE: NCSC!; ISOTYPES: FSU!, MO!).

Coreopsis gladiata similis sed differt caulibus ascendentibus vel paene prostratis, foliis basalibus ac caulinis inferis ad nodos quatuor vel plus tempore anthesis carentibus, foliis midcaulinis ellipticis, alis acheniorum 0.25 mm latis in quoque latere corpis, et aristis acheniorum peraeque 0.8 mm longis.

Similar to *Coreopsis gladiata* but stems ascending or nearly prostrate, basal and lower cauline leaves at four or more nodes absent during anthesis, mid-cauline leaves elliptical, achene wing 0.25 mm wide on each side of body, and achene awns average 0.8 mm long.

NABALUS

The interpretation that *Prenanthes* includes North American species has been repeatedly questioned over the past two centuries on many grounds: general morphology, achene vasculature, and molecular sequence data (Small 1933; Schilling & Floden, unpublished data). There now appears to be a general consensus to recognize *Nabalus* Cassini (1825) as a separate genus of North America and east Asia, as indicated by its recent acceptance in major worldwide synopses of the Asteraceae and indications based on molecular phylogenies that it is not even closely related to *Prenanthes* s.s. (Lack in Kadereit & Jeffrey 2007; Kilian, Gemeinholzer & Lack in Funk et al. 2009); morphological studies also support the separation of the two genera (Shih 1987).

Most North American species in this group have been treated in *Nabalus* in the past, as by Small (1933), but three North American taxa of this group lack valid names in *Nabalus* because of their recent naming, disagreement on their taxonomic recognition, or past nomenclatural confusions. These combinations are made here.

Nabalus autumnalis (Walter) Weakley, comb. nov. BASIONYM: *Prenanthes autumnalis* Walter, Fl. Carol 193. 1788. *Nabalus*

FIG. 1. Holotype of *Coreopsis palustris* Sorrie (NCSC).

virgatus DC., Prodr., 7(1):242. 1838, nom. superfl. & illeg.; *Prenanthes virgata* Michx., Fl. Bor.-Amer. 2:83. 1803, nom. superfl. & illegit. (based on *P. autumnalis* Walter).

Nabalus carrii (Singhurst, O'Kennon & W.C. Holmes) Weakley, comb. nov. BASIONYM: *Prenanthes carrii* Singhurst, O'Kennon & W.C. Holmes, Sida 21:187, fig. 2, 2004. TYPE: U.S.A. TEXAS. Bandera Co.: Lost Maples State Natural Area, above and below Upper Forks of Mystic Canyon Trail, 1 Sep 2001, *Singhurst & Singhurst 12496* (HOLOTYPE: BAYLU).

Nabalus trifoliolatus Cass. var. **nanus** (Bigelow) Weakley, comb. nov. BASIONYM: *Prenanthes alba* L. var. *nana* Bigelow, Fl. Boston, ed. 2:286. 1824.

PACKERA

Packera Á. Löve & D.Löve is now routinely accepted as a genus separate from *Senecio*, as indicated by its recent usage in *Flora of North America* (Trock in FNA 2006) and major worldwide synopses of the Asteraceae (Nordenstam et al. in Funk et al. 2009; Nordenstam in Kadereit & Jeffrey 2007). While the routine creation of hybrid binomials is questionable, the hybrid between the rare, southern Blue Ridge endemic *P. millefolium* (Torr. & A. Gray) W.A. Weber & Á. Löve and the more widespread and weedy *P. anonymus* (Alph.Wood) W.A.Weber & Á. Löve is well-documented, frequently collected, and has conservation implications because of its genetic swamping of the narrowly endemic *P. millefolium* at some populations (Gramling 2006). For these reasons, it is helpful for it to have a hybrid binomial in *Packera* for ease of reference in conservation and herbarium work.

Packera ×memmingeri (Britton ex Small) Weakley [*anonymus* × *millefolium*], comb. nov. BASIONYM: *Senecio memmingeri* Britton ex Small (pro sp.), Bull. Torrey Bot. Club 25:147. 1898.

Note also that the epithet "*millefolium*" in *Packera millefolium* (Torr. & A. Gray) W.A. Weber & Á. Löve is based on *Senecio millefolium* Torr. & A. Gray, and that they used it as a noun in apposition (in reference to *Millefolium* P. Miller, used for *Achillea* L.) rather than as an adjective, as also reflected by its capitalization in earlier floristic works (e.g., Torrey & Gray 1843; Chapman 1883; Small 1933; Fernald 1950); therefore the correct name in *Packera* is *Packera millefolium* (Torr. & A. Gray) W.A.Weber & Á. Löve, with the epithet "*millefolium*," not grammatically declined to "*millefolia*," as done by Trock in FNA (2006), Kartesz (1999, 2010), Barkley (1999), and other recent publications.

BORAGINACEAE

LITHOSPERMUM

The North American endemic genus *Onosmodium* Michx. has traditionally been regarded as distinct from the more widespread *Lithospermum* L. on the basis of several morphologic features, primarily the erect and acute corolla lobes and exserted style (as opposed to rounded and spreading corolla lobes and included style) (Al-Shehbaz 1991). Recent molecular studies show that *Onosmodium* is deeply embedded within *Lithospermum*, and that a re-evaluation of morphological features supposedly characteristic of *Onosmodium* reveals them as merely a more limited set of characters found in the morphologically more diverse *Lithospermum* (Weigend et al. 2009; Cohen & Davis 2009). While *Onosmodium* itself is a monophyletic group, interestingly with the southeastern North American *Lithospermum tuberosum* Rugel as a basal component (Weigend et al. 2009; Cohen & Davis 2009), its recognition at the generic rank renders *Lithospermum* paraphyletic and is also not warranted on the basis of morphological distinctiveness (the frequency of misidentifications between *Lithospermum* and *Onosmodium* is suggestive). Some combinations in *Lithospermum* for taxa of *Onosmodium* are already available [*Lithospermum virginianum* L., *Lithospermum molle* (Michx.) Muhl., *Lithospermum onosmodium* J. Cohen, *Lithospermum helleri* (Small) J.Cohen], but other currently recognized taxa of *Onosmodium* lack names in *Lithospermum*.

In transferring taxa of *Onosmodium* to *Lithospermum*, taxonomic rank is a complex issue requiring revisiting; while most of the currently recognized taxa have been universally and uncontroversially recognized as taxa by modern workers, the taxonomic rank at which they have been recognized has been variable, involving specific, subspecific, and varietal designations. The complex involving taxonomic entities "*molle*," "*hispidissimum*," "*subsetosum*," "*occidentale*," and (sometimes) "*bejariense*" has been particularly variable in treatment,

with entities either recognized as species (Mackenzie 1905; Fernald 1950; Gleason 1952), as varieties under *O. molle* (Gleason & Cronquist 1991), as subspecies under *O. molle* (Cochrane 1976; Al-Shehbaz 1991), as subspecies more broadly under *O. bejariense* (Turner 1995), lumped entirely as *O. molle* (Small 1933), or apparently but ambiguously lumped (Cohen & Davis 2009).

Turner (1995) referred to the taxa in this complex (from which he excluded *O. molle*) as "morphogeographical taxa," treated them as varieties of *O. bejariense*, mapped them as completely or nearly allopatric (Turner 1995, figs. 1–5), and stated that "in regions of contact, intermediates between these morphogeographical taxa commonly occur." Our experiences and those of many other botanists active in the southeastern United States suggest a different situation, with two or more taxa often sympatric and morphologically distinctive in various regions of the Southeast, and sometimes occurring together at individual sites. For instance, four entities ("*molle*," "*hispidissimum*," "*subsetosum*," and "*occidentale*") all occur in close proximity in the Interior Low Plateau and Eastern Highland Rim of Tennessee (UTK & APSU 2011) and adjacent states, such as Alabama (Datillo & Nestor 2011), while Turner (1995) mapped only two entities east of the Mississippi River, apparently based on a sparse sampling of only a total of six county records from Tennessee, Alabama, Mississippi, and Kentucky for the complex of *hispidissimum* + *subsetosum* + *occidentale* (excluding *molle*).

A pattern of sympatry of these taxa across portions of the southeastern United States, with two or more species sometimes co-occurring at a site and maintaining overall morphological distinctiveness, their maintenance of characters in common garden situations, and their manifestation of biogeographic patterns seen in many other genera (for instance, the disjunction, presumably relictual, of Interior Highlands [Ozark/Ouachita] taxa to the Interior Low Plateau and adjacent Eastern and Western Highland Rims) suggests that specific status better reflects the current relationship of these undoubtedly closely related entities (Weakley et al., in prep.). The majority of southeastern field botanists familiar with these taxa in the field regard them as being best treated at specific rank. Furthermore, nomenclatural stability of the taxa in this complex has not been well served by their treatment at three different ranks (species, subspecies, and variety) and by their variable inclusion / exclusion in the complex of *O. molle*, the oldest entity, therefore resulting in infraspecific combinations at two ranks and under two different species (*O. molle* and *O. bejariense*) (see synonymy listed below). In-progress studies by A.S. Weakley, C.T. Witsell, and L.D. Estes suggest that *O. molle* does not appear to be more strongly offset from the taxa treated by Turner (1995) as varieties of *O. bejariense* than they are from one another. It is therefore our opinion that biological reality and nomenclatural stability are both best served by treating these taxa at specific rank, and in *Lithospermum*. We make the following additional new combinations to complement those already available in *Lithospermum*.

Lithospermum decipiens (J.R. Allison) Weakley, Witsell & D. Estes, comb. nov. BASIONYM: *Onosmodium decipiens* J.R. Allison, Castanea 66:180, Fig 10, 2001. TYPE: U.S.A. ALABAMA. Bibb Co.: ca. 13.7 km NE of Centreville, "Fern Glade," Ketona Dolomite outcrop above the right (N) bank of the Little Cahaba River, 1 Nov 1993, *James R. Allison and Timothy E. Stevens 8139* (HOLOTYPE, NY; ISOTYPES: AUA, DUKE, GA, GH, JSU, MICH, MO, UNA, US, VDB).

Lithospermum occidentale (Mack.) Weakley, Witsell & D. Estes, comb. nov. BASIONYM: *Onosmodium occidentale* Mack., Bull. Torrey Bot. Club 32:502. 1905. *Onosmodium molle* Michx. var. *occidentale* (Mack.) I.M. Johnston, Contr. Gray Herb. 70:18. 1924. *Onosmodium molle* Michx. ssp. *occidentale* (Mack.) T.S. Cochrane, Michigan Bot. 15:104. 1976. *Onosmodium bejariense* A.DC. var. *occidentale* (Mack.) B.L. Turner, Phytologia 78:46. 1995.

Lithospermum parviflorum Weakley, Witsell & D. Estes, nom. nov. BASIONYM: *Onosmodium hispidissimum* Mack., Bull. Torrey Bot. Gard 32:500. 1905, non *Lithospermum hispidissimum* Lehmann (1823). *Onosmodium molle* Michx. var. *hispidissimum* (Mack.) Cronquist. *Onosmodium molle* Michx. ssp. *hispidissimum* (Mack.) Cochrane, Michican Bot. 15:104. 1976. *Onosmodium bejariense* A.DC. var. *hispidissimum* (Mack.) B.L. Turner, Phytologia 78:45. 1995. As the epithet "*hispidissimum*" is blocked from transfer to *Lithospermum* by its unsurprisingly prior usage in that very hispid genus, a new name is required. We have selected the epithet "*parviflorum*" to emphasize the smaller flowers of this taxon as compared to its relatives in the *Lithospermum onosmodium* complex.

Lithospermum subsetosum (Mack. & Bush) Weakley, Witsell & D. Estes, comb. nov. BASIONYM: *Onosmodium subsetosum* Mack. & Bush, in J.K. Small, Fl. S.E. U.S. 1001. 1903. *Onosmodium molle* Michx. var. *subsetosum* (Mack. & Bush) Cronquist, Vasc. Pl. Pacific NorthW. [C.L. Hitchcock et al.] 4:234. 1959. *Onosmodium molle* Michx. ssp. *subsetosum* (Mack. & Bush) Cochrane, Michigan Bot. 15:104. 1976. *Onosmodium bejariense* A.DC. var. *subsetosum* (Mack. & Bush) B.L. Turner, Phytologia 78:47. 1995.

HYMENOPHYLLACEAE

CREPIDOMANES

Recent phylogenetic and other studies of the Hymenophyllaceae have emphasized the diversity of evolutionary groups, especially in what has often been treated as a broadly defined *Trichomanes* L. Specifically, the recognition of smaller, morphologically more homogeneous clades within *Trichomanes* s.l. has been recently promoted by Ebihara et al. (2006, 2007). Three strikingly different species of *Trichomanes* sensu lato are distributed in temperate eastern North America: *T. boschianum* Sturm, *T. petersii* A. Gray, and *T. intricatum* Farrar. They fall into three different clades within *Trichomanes s.l.*, and correspondingly within three separate segregate genera, as recognized by Ebihara et al. (2006, 2007). The first two have existing names in their appropriate segregate genera, *Vandenboschia boschiana* (Sturm) Ebihara & K. Iwats. and *Didymoglossum petersii* (A. Gray) Copel., respectively, while the third does not. *Trichomanes intricatum* is an interesting and indeed seemingly intricate case. Ebihara, Farrar, and Ito (2008) used chloroplast molecular sequence data to determine that *T. intricatum* is very closely related to *Crepidomanes schmidtianum* (Zenker ex Tasch.) K. Iwats. var. *schmidtianum*. While this might be used as evidence to merge them, the following factors argue against such a course, at least pending future research to definitely determine their evolutionary relationship: 1) *T. intricatum* is a free-living gametophytic species, in contrast with *C. schmidtianum*, which has a standard sexual alternation of sporophytic and gametophytic generations, 2) all known samples of the ploidy of *C. schmidtianum* show it to be sterile triploid, while the ploidy of *T. intricatum* is unknown (Ebihara, Farrar, & Ito 2008), and 3) *T. intricatum* is isolated in North America from the remainder of *Crepidomanes*, which is Old World, a seemingly relictual distribution, and can reasonably be judged to be on an independent evolutionary trajectory from its Old World *Crepidomanes* congeners. For these reasons, we opt to continue to recognize *T. intricatum* as a separate species of enigmatic origin and to transfer it to its appropriate generic affiliation.

Crepidomanes intricatum (Farrar) Ebihara & Weakley, comb. nov. BASIONYM: *Trichomanes intricatum* Farrar, Amer. Fern J. 82:68–69, figs. 2, 3, 1992. TYPE: U.S.A. ILLINOIS. Hardin Co.: Hooveh Hollow, along base of north-facing cliffs of Pottsville sandstone along Rock Creek, 6 Jan 1982, *D. Farrar 82-1-6-6* (HOLOTYPE ISC; ISOTYPES NY, US, MICH, US, MO).

HYPERICACEAE

HYPERICUM

Hypericum densiflorum Pursh is a wide-ranging species of the Atlantic Coastal Plain and Appalachian Mountains, from New Jersey and West Virginia south to South Carolina and Alabama. Adams (1962, 1973) noted that the distribution is discontinuous and restricted to five discrete regions: the coastal plain of New Jersey, Delaware, and Maryland; coastal plain of North and South Carolina; Allegheny Plateau of Pennsylvania, Maryland, and West Virginia; Blue Ridge of Virginia and North Carolina; and Ridge and Valley of Tennessee, Georgia, and Alabama. Despite the suggestive taxonomic possibilities inherent in five allopatric population centers, only the Ridge and Valley plants have been accorded separate status, as *H. interior* Small (= *H. revolutum* Keller). The narrow, somewhat revolute leaves of these plants prompted Small (1901, 1933) and Keller (1923) to separate *H. interior* as specifically distinct. However, authors since Small have not recognized *H. interior*, nor have they recognized any infraspecific taxa in *H. densiflorum*.

We could find no discernible differences among any of the five *H. densiflorum* populations regarding capsule length and seed morphology. Capsules ranged from 4.0–6.5 mm regardless of collecting locality. In fact, this measurement varied as much on any given specimen as it did among populations. Seeds ranged from 0.8–1.1 mm regardless of locality, with one exception: 1.1–1.3 mm in Garrett County, Maryland (Downs *7777*, NCU), which we consider to be anomalous. Seed ornamentation did not vary across the range of *H. densiflorum*: all had pits in uniform rows of even width. The sample size of fruiting plants at NCU was relatively small, since the great majority of specimens were collected in flower, so that additional measurements from other herbaria may alter our data relative to seed ornamentation.

The leaf width data, however, were distinctly bimodal (Table 1). The Ridge-and-Valley population has

TABLE 1. Mean and range of leaf width for populations of *Hypericum densiflorum*.

Population	mean leaf width in mm	range of leaf width in mm
Coastal Plain NJ–DE	5.7	3.5–7.9(–8.2)
Coastal Plain NC–SC	4.7	(2.8–)3.0–7.0(–8.2)
Allegheny Plateau PA–MD–WV	5.3	(3.0–)3.6–6.8(–7.6)
Blue Ridge VA–NC	5.4	(1.8–)2.8–8.3(–9.2)
Ridge-and-Valley TN–GA–AL	2.0	(0.9–)1.0–3.7

leaves that average less than half that of the other four populations. Ridge-and-Valley plants consistently exhibit narrow leaves, with no intermediacy or clinal tendancy.

The geographic structure of the variation in leaf width argues for recognition of a taxon, but since leaf width seems to be the only reliable character which distinguishes entity "*interior*" from the remainder of entity "*densiflorum*," we conservatively choose to treat "*interior*" at varietal rank.

Hypericum densiflorum Pursh var. **interior** (Small) Sorrie & Weakley, comb. et stat. nov. BASIONYM: *Hypericum interior* Small, Bull. Torrey Bot. Club 28:359–360. 1901. TYPE: U.S.A. TENNESSEE. JEFFERSON COUNTY: ad rivulos prope Dandridge, Jul 1842, *Rugel s.n.* (HOLOTYPE: NY!, image examined online).

LOGANIACEAE

SPIGELIA

Katherine Gould Mathews conservatively chose varietal status when she (as K. Gould) named a plant discovered by Allison and Stevens (2001) at the dolomitic Ketona glades in Bibb County, Alabama, at the southern end of the Ridge and Valley Province, which showed affinity to the extremely rare *S. gentianoides* Chapm. ex A.DC. of Florida and southern Alabama longleaf pinelands. The subsequent publication of about a dozen highly distinctive, new vascular plant taxa (mainly at species rank) from this site (Allison & Stevens 2001; Kral & Moffett 2009) have since emphasized the Ketona glades as a major site of the evolutionary generation of endemics, and the retention of ancient relictual taxa, at this southernmost edge of the Appalachian Mountains. A recent conservation assessment of *S. gentianoides* and its two varieties (USFWS 2009) suggests the possibility that the two taxa warrant specific rank. Gould (1996) lists numerous and strong character state differences (many of them discrete and non-overlapping) between the two taxa. Reassessing the appropriate ranks of these taxa by any of various modern "species concepts" and by standards of taxonomic rank normally applied regionally and to taxa in the genus *Spigelia*, we now judge that specific rank is warranted, though additional molecular and morphological studies should be conducted to corroborate this treatment.

Spigelia alabamensis (K. Gould) K.G. Mathews & Weakley, comb. et stat. nov. BASIONYM: *Spigelia gentianoides* Chapm. ex A.DC. var. *alabamensis* K.Gould, Sida 17:418. 1996. TYPE: U.S.A. ALABAMA. Bibb Co.: large Ketona dolomite glade on hillside above the Little Cahaba River from County Road 65, off Hwy. 25, 30 May 1996, *Katherine Gould 145 & Sheryl Gould* (HOLOTYPE: TEX; ISOTYPES: FLAS, FSU, GA, GH, UNA).

OLEACEAE

CARTREMA

A number of recent studies (morphological, anatomical, and molecular) have suggested that *Osmanthus* Lour. as generally and recently circumscribed is paraphyletic (summarized in Guo et al. 2011). The most obvious discordant element is the section *Leiolea* (Spach) P.S. Green, morphologically distinguished most obviously by its paniculate inflorescences (contrasting with the fascicled inflorescences of *Osmanthus* sensu stricto) and occurring in eastern and southeastern Asia, and southeastern North America south to Mexico and Central America (Green 1958). J.K. Small (1933) recognized the distinctiveness of this element and created the genus *Amarolea* Small to accommodate the two entities, "*americanus*" and "*megacarpus*," distributed in the southeastern United States. Rafinesque had presaged this by nearly a century, however, establishing the genus *Cartrema*

Rafinesque in 1838 with his trademark combination of perception and sloppiness, the genus required a renaming via a correction in the original, and in addition to transferring *Olea americana* L. to *Cartrema*, he two years later published a second, and therefore illegitimate, epithet for the same taxon [*Cartrema odorata* (Raf.) Raf.].

While the molecular phylogenetic study of Guo et al. (2011) does not resolve all the issues with generic circumscription in subtribe Oleinae, it does clearly establish that section *Leiolea* is monophyletic, and falls in a larger clade with *Olea* and *Linociera*, not *Osmanthus* sensu stricto. We therefore accept *Cartrema* Raf. as the appropriate generic placement for the group of taxa formerly treated in *Osmanthus* section *Leiolea*. *Cartrema americana* (L.) Raf. was established by Rafinesque, but *Osmanthus megacarpus* (Small) Small ex Little requires a new combination (made below); we agree with recent authors who have opted to treat this taxon at specific rank (e.g., Wunderlin & Hansen 2011). Other taxa in section *Leiolea* (as treated by Green 1958) distributed in Mexico, Central America, and eastern and southeastern Asia apparently also warrant transfer to *Cartrema*, but we refrain from making these transfers at this time, as the appropriate specific and varietal treatment remains unclear and is beyond the scope of this study.

Cartrema megacarpa (Small) Weakley, comb. nov. BASIONYM: *Amarolea megacarpa* Small, Man. S.E. Fl. 1043. 1933. TYPE: U.S.A. FLORIDA. Highlands Co.: near Lake Annie, 8 Jan 1925, *J.K. Small & Matthaus 11612* (HOLOTYPE: NY).

Osmanthus megacarpus (Small) Small ex Little, J. Wash. Acad. Sci. 33:10. 1943.

POACEAE

ANDROPOGON

We admire and commend Campbell's (1983) monograph, which rightly returned botanists to the recognition of numerous taxa in the "*A. virginicus* complex," following the extremely broad treatment of the group by Radford (1968) in the regionally influential *Manual of the Vascular Flora of the Carolinas* (Radford, Ahles, & Bell 1968). In the number and circumscription of taxa, Campbell's (1983) conclusions closely resemble those of Hackel (1889), suggesting that taxonomy does not always progress forward in a straightforward path towards the truth. We also appreciate Campbell's (1983) use of a kind of numerical scale to determine the appropriate taxonomic rank of entities he considered worthy of recognition, with 3 or fewer reliable character state differences meaning an informal rank distinction of "variant," 4–6 meaning formal varietal distinction, and 7–9 meaning formal specific distinction, as a tool to render new order out of the then recently past and simplistic chaos. Several decades after Campbell's insightful work, the observable biological realities of this complex of taxa clearly warrant new opinions on taxonomic rank. Campbell (1986) himself provided some preliminary reassessments, elevating some taxa formerly treated as informal "variants" to formal taxonomic status based on a "phylogenetic reconstruction" of the group, although other groupings made by Campbell of formal (variety) and informal ("variants") within species were not supported by the analysis, or only weakly so.

After an examination of the literature, herbarium specimens, and living populations, we conclude that the three striking, chalky-white bluestem grasses of the southeastern United States Coastal Plain—*A. capillipes* Nash, *A. dealbatus* (C. Mohr) Weakley & LeBlond (combination made below), and *A. glaucopsis* Elliott—are distinctive as species. Plants referable to *A. glaucopsis* and *A. capillipes* have been recognized as species or varieties in several treatments since the mid-20th century (Fernald 1950; Hitchcock and Chase 1951; Godfrey and Wooten 1979; Campbell 1983; Wunderlin and Hansen 2011; Campbell 2003). During that same period, plants referable to *A. dealbatus* have been treated in synonymy with *A. capillipes*. Following the original published descriptions of *A. capillipes* (as *A. virginicus* L. var. *glaucus* Hackel) and *A. dealbatus* (as *A. virginicus* var. *dealbatus* C. Mohr) by Hackel (1889), the three taxa had not been treated together until the landmark monograph of the *Andropogon virginicus* complex by Campbell (1983). Campbell chose not to treat *A. capillipes* and *A. dealbatus* as formally distinct and instead treated them as informal variants comprising a single taxon, *A. virginicus* var. *glaucus*. Plants referable to *A. capillipes* he called the "drylands variant" and those referable to *A. dealbatus* were called the "wetlands variant."

Andropogon capillipes, *A. dealbatus*, and *A. glaucopsis* are most readily separated from other members of the *A. virginicus* complex by the strongly chalk-white leaves (*A. perangustatus* Nash and Campbell's "smooth

variant" of *A. virginicus* var. *virginicus* can have slightly glaucous leaves). *Andropogon glaucopsis* is further separated from *A. capillipes*, *A. dealbatus*, and *A. virginicus* sensu lato (sensu Campbell) by ligule and leaf blade lengths. In *A. glaucopsis*, the membranous portion of the ligule is (0.9–)1.5(–2.0) mm long, while in the other taxa collectively it is (0.2–)0.3–0.5(–1.0) mm long. Length of cilia terminating the ligule also differ, with those of *A. glaucopsis* 0–0.2 mm long and those of the others collectively 0.2–1.3 mm long. Leaf blades are (33–) avg. 40(–75) cm long in *A. glaucopsis* and collectively (11–)17–30(–52) cm long in *A. capillipes*, *A. dealbatus*, and *A. virginicus* sensu lato.

Campbell (1983) states that the "strong overlap in the characters separating the drylands and wetlands variants and the breakdown in the correlation of these characters in about five percent of all populations examined in the herbarium are the reasons these two taxa are not recognized nomenclaturally." But Campbell (1983) also found that in "the majority of instances .. morphological and soil-moisture differences are correlated. I have seen these taxa growing within one to three meters of one another at three localities in northwestern Florida. At only one of these was there difficulty in classifying any individual: a single plant on a slope between a bog inhabited by the wetlands variant and a roadside lined with the drylands variant combined the morphological features of these two taxa."

Ideally, taxonomic decisions should be based on the behavior of natural populations rather than on herbarium specimens, which are extremely useful but sometimes imperfect or even misleading representations of wild plant populations. Our own experience and that of many other field botanists in the southeastern United States suggest that the two entities are strongly distinct. Many taxa recognized as species (correctly in our opinion) are represented in herbaria by well more than 5% of specimens that are not confidently and definitely identifiable, because of specimen conditions. In field work involving all states in the ranges of these two taxa, we have not found a single plant from living populations that was not readily assignable to one taxon or the other, and Campbell (1983) himself indicates finding only that single individual that was ambiguous in live condition.

In our own examination we have found a consistent correlation between spikelet length and the presence/absence of pubescence (longish hairs) below the raceme sheath and an overlapping but supportive alignment of raceme sheath length, raceme axis length, average leaf width, and upper floret lemma awn length. As noted by Campbell, habitat differences also help to distinguish these taxa. *Andropogon capillipes* is found in dry to mesic pinelands and adjacent roadbanks, while *A. dealbatus* prefers wet savannas, depressional wetlands, and adjacent ditches. *Andropogon capillipes* also occurs over a narrower range, from southeastern North Carolina south to Florida and west to Alabama. *Andropogon dealbatus* is more disjunctly widespread, occurring in southern New Jersey; North Carolina south to Florida and west to Texas; and the Bahamas (Sorrie & LeBlond 1997). Fernald (1950) cited southeastern Virginia as the northern limit for *A. capillipes*, but Campbell did not cite a Virginia specimen, nor have we been able to locate one.

In our opinion, *Andropogon glaucopsis* Elliott is not only distinct from the two smaller chalky bluestems (*A. capillipes* and *A. dealbatus*) but also from *A. glomeratus*, with which it has sometimes been related at varietal rank. Its morphology and distribution seem to us sharply distinct, and it co-occurs frequently and abundantly with *A. glomeratus*, with no signs of intergradation. *Andropogon glaucopsis* therefore behaves as a species and warrants specific rank (Weakley 2011; E. Bridges & S. Orzell, pers. comm.).

The following key distinguishes the strongly white-waxy-leaved species from one another.

1. Ligule 0.9–2.0 mm long, averaging 1.5 mm, with cilia 0–0.2 mm long; raceme sheaths (1.3–)2.0–2.5(–3.0) mm wide, (2.0–)2.4–3.6(–4.4) cm long; leaf blades (33–) avg. 40(–75) cm long _____ **A. glaucopsis**
1. Ligule 0.2–0.5 mm long, with cilia 0.3–1.2 mm long; raceme sheaths (2.7–)3.0–4.2(–5.5) mm wide, (2.1–)2.6–4.8(–6.0) cm long; leaf blades (12–) avg. 19(–38) cm long.
   2. Summit of branchlet below attachment of raceme sheath glabrous; spikelets (2.6–)3.2–3.5(–3.9) mm long; raceme sheaths (2.1–)2.6–3.8(–4.9) cm long; racemes (1.4–)1.7–2.4(–3.2) cm long; leaves (2–) avg. 3.5(–5) mm wide; upper floret lemma awn (0.6–) avg. 1.1(–1.5) mm long; plant of dry to mesic pinelands and roadbanks _____ **A. capillipes**
   2. Summit of branchlet below attachment of raceme sheath pubescent with ascending hairs 2–4 mm long; spikelets (3.0–)3.5–3.9(–4.4) mm long; raceme sheaths (2.4–)3.2–4.8(–6.0) cm long; racemes (1.5–)2.0–3.0(–4.0) cm long; leaves (2.5–)5(–6.5) mm wide; upper floret lemma awn (0.9–) avg. 1.4(–2.1) mm long; plant of wet pinelands and ditches _____ **A. dealbatus**

Andropogon perangustatus Nash has sometimes been treated at varietal rank relative to *A. gyrans* W.W. Ashe, as *A. gyrans* var. *stenophyllus* (Hackel) C.S. Campbell, but it seems to us only tenuously related to *A. gyrans* and very distinct based on multiple morphological characters, different habitats, and different (though overlapping) distributions. The two taxa sometimes occur in close proximity in the southeastern Coastal Plain and show habitat fidelity and an apparent absent of any hybrids, intergrades, or morphological intermediates. We therefore also treat this taxon at specific rank (Weakley 2011, E. Bridges & S. Orzell, pers. comm.).

The southeastern Coastal Plain endemic *Andropogon mohrii* Hackel also seems to warrant specific status rather than treatment at varietal rank under *A. liebmannii* Hackel, as var. *pungensis* (Ashe) C.S. Campbell (Weakley 2011). Uniting the two as varieties of *A. liebmannii* implies that they are most closely related to one another, and perhaps they are, but Campbell (1986) provided no support for their monophyly. Even if sister taxa, specific status seems warranted by their morphological differences and allopatric distributions.

Andropogon tenuispatheus (Nash) Nash (the "robust variant" of *A. glomeratus* var. *pumilus* of Campbell [1983], becoming equivalent to *A. glomeratus* var. *pumilus* upon removal of the "southwestern variant" as *A. glomeratus* var. *scabriglumis* Campbell [Campbell 1986, 2003]) also warrants distinction at specific rank from *A. glomeratus*. Based on morphology, ecology, and distribution, there seems to be no reason not to recognize these taxa as distinct species (Weakley 2011).

The elevation (or re-elevation in most cases) of various "*glomeratus*" entities to specific rank highlights the status of the "*hirsutior*" entity, variously lumped in *A. virginicus* (Radford, Ahles, & Bell 1968)), lumped in *A. glomeratus* (Hitchcock & Chase 1951, Small 1933), treated as a variety of *A. virginicus* as *A. virginicus* var. *hirsutior* (Hackel) A.S. Hitchcock, or treated as a variety of *A. glomeratus* (Campbell 1983, 2003). The "*hirsutior*" entity frequently co-occurs with *A. glomeratus* and *A. glaucopsis*, all three often being abundant at the same site with no signs of introgression or intermediacy, and all individuals being easily identified as one of the three entities. Campbell (1983) also established that the somewhat superficially similar "*glaucopsis*" entity and "*hirsutior*" entity are genetically distinct. Campbell's (1986) analysis suggested that the "*hirsutior*" entity is most closely related to the "*glaucopsis*" entity, but we do not regard it as conspecific with either "*glaucopsis*" or "*glomeratus*" for the reasons stated above. We therefore believe that specific status is warranted for this entity, as suggested by Weakley (2011).

Two new combinations are needed to implement this taxonomic scheme.

Andropogon dealbatus (C. Mohr) Weakley & LeBlond, comb. et stat. nov. BASIONYM: *Andropogon virginicus* var. *dealbatus* C. Mohr in A.L.P.P. de Candolle & A.C.P. de Candolle, Monogr. Phan 6:411. 1889. TYPE: U.S.A. ALABAMA. Mobile Co.: Mobile, 1884, *Mohr s.n.* (HOLOTYPE: W).

Informal synonym: *A. virginicus* L. var. *glaucus* Hackel in DC. "wetlands variant" in the sense of Campbell (1983, 2003).

Andropogon hirsutior (Hackel) Weakley & LeBlond, comb. et stat. nov. BASIONYM: *Andropogon macrourus* Michx. var. *hirsutior* Hackel in A.L.P.P. de Candolle & A.C.P. de Candolle, Monogr. Phan. 6:411. 1889. TYPE: U.S.A. ALABAMA. Mobile Co.: Mobile, 28 Oct 1884, *Mohr s.n.* (HOLOTYPE: W).

Andropogon glomeratus Britton, Sterns, & Poggenb. var. *hirsutior* (Hackel) C. Mohr, Bull. Torrey Bot. Club 24:21. 1897.

COLEATAENIA

As part of the ongoing dismantling of *Panicum* into more natural and monophyletic units, Zuloaga, Scataglini, & Morrone (2010) proposed that taxa previously treated within *Panicum* sects. *Agrostoidea* and *Tenera* should be placed in a new genus *Sorengia* based on morphological and molecular characters. Following publication, it was determined by Soreng (2010) that the new generic name *Sorengia* was illegitimate, as the type of an older legitimate generic name, *Coleataenia*, was included as a synonym within one of the species of the new genus.

As explained below under each new combination, we differ as to the most appropriate taxonomic rank at which some of the entities in this group should be recognized.

Coleataenia abscissa (Swallen) LeBlond, comb. nov. BASIONYM: *Panicum abscissum* Swallen, J. Wash. Acad. Sci. 30:215, f.4, 1940. *Panicum rigidulum* Bosc ex Nees ssp. *abscissum* (Swallen) Freckmann & Lelong, Sida 20:172. 2002. *Sorengia longifolia* (Torr.) Zuloaga & Morrone ssp. *abscissa* (Swallen) Zuloaga & Morrone, Taxon 59:1542. 2010. *Coleataenia longifolia* (Torr.) Soreng ssp. *ab-*

scissa (Swallen) Soreng, J. Bot. Res. Inst. Texas 4:691. 2010. TYPE: U.S.A. FLORIDA. Highlands Co.: Sebring, in dry sand at tourist camp near lake, 3 Oct 1925, *Weatherwax s.n.* (HOLOTYPE: US).

This central Florida endemic is returned to species rank due to the unique structure of the sheath summit, ligule, and blade base. There is no known introgression with other taxa. Within its limited range, it is often the dominant herbaceous plant in moist flatwoods and depressions.

Coleataenia rigidula (Bosc ex Nees) LeBlond ssp. **condensa** (Nash) LeBlond, comb. et stat. nov. BASIONYM: *Panicum condensum* Nash, Fl. S.E. U.S. 93, 1327. 1903. *Panicum agrostoides* Sprengel var. *condensum* (Nash) Fernald, Rhodora 36:74. 1934. *Panicum rigidulum* Bosc ex Nees var. *condensum* (Nash) Mohlenbr., Ill. Ind. Bot. 71. 1973. TYPE: U.S.A. FLORIDA. Duval Co.: near Jacksonville, 16 Oct 1895, *Curtiss 5576* (HOLOTYPE: NY; ISOTYPES: MO, US).

Although Gleason (1952) stated that the "*Panicum condensum* entity" intergraded "completely" with "*P. agrostoides* var. *agrostoides*" (what is here called *Coleataenia rigidula* ssp. *rigidula*), he nonetheless provided distinguishing characters, suggesting some ambivalence. This taxon's striking habit, tendency for larger spikelets, and restriction to the Coastal Plain support continued recognition of a distinctive genetic trend.

Coleataenia rigidula (Bosc ex Nees) LeBlond ssp. **rigidula,** comb. nov. BASIONYM: *Panicum rigidulum* Bosc ex Nees, Fl. Bras. Enum. Pl. 2:163. 1829. *Sorengia longifolia* (Torr.) Zuloaga & Morrone ssp. *rigidula* (Bosc ex Nees) Zuloaga & Morrone, Taxon 59:1542. 2010. *Coleataenia longifolia* (Torr.) Soreng ssp. *rigidula* (Bosc ex Nees) Soreng, J. Bot. Res. Inst. Texas 4:691. 2010. TYPE: U.S.A. *Bosc s.n.* (HOLOTYPE).

Panicum agrostoides Muhl., Descr. Gram. 119. 1817, nom. illeg., non Spreng. (1815). TYPE: "Muhlenberg Herbarium deposited by American Philosophical Society," *Muhlenberg 177.* (LECTOTYPE: PH).

Panicum elongatum var. *ramosior* C. Mohr, Contr. U.S. Natl. Herb. 6:357. 1901. *Panicum agrostoides* var. *ramosius* (C. Mohr) Fernald, Rhodora 38:390. 1936. TYPE: U.S.A. ALABAMA. Mobile Co.: Pierce's Landing, Oct 1885, *Mohr s.n.* (HOLOTYPE: US).

The distinctive difference in ligule structure between *Coleataenia longifolia* sensu stricto and *C. rigidula* entities (including *C. stipitata*) argues for a taxonomic split at the species rank. The *longifolia* ligule is comprised of white hairs 0.5–3 mm long, while the *rigidula* ligule is a tawny membrane 0.3–1 mm long. The leaves of *longifolia* are usually pubescent and folded or involute, while the mostly wider leaves of *rigidula* are glabrous and flat. Upper leaves are characteristically shorter than the panicles in *longifolia*, and more-or-less equal to the panicles in *rigidula*.

Coleataenia stipitata (Nash) LeBlond, comb. nov. BASIONYM: *Panicum stipitatum* Nash, Bull. Div. Agrostol., U.S.D.A. 17:56. 1901. *Panicum elongatum* Pursh, Fl. Amer. Sept. 1:69. 1814, nom. illeg., non Salisb. (1796). *Panicum agrostoides* var. *elongatum* Scribn., Bull. Agric. Exp. Sta. Univ. Tennessee 2:42. 1894. *Panicum rigidulum* Bosc ex Nees var. *elongatum* (Scribn.) Lelong, Brittonia 36:263. 1984. *Panicum rigidulum* Bosc ex Nees ssp. *elongatum* (Pursh) Freckmann & Lelong, Sida 20:172. 2002, corrected to *Panicum rigidulum* Bosc ex Nees ssp. *elongatum* (Scribn.) Freckmann & Lelong in Flora of North America 25:478. 2003. *Sorengia longifolia* (Torr.) Zuloaga & Morrone ssp. *elongata* (Scribn.) Zuloaga & Morrone, Taxon 59:1542. 2010. *Coleataenia longifolia* (Torr.) Soreng ssp. *elongata* (Scribn.) Soreng, J. Bot. Res. Inst. Texas 4:691. 2010. TYPE: U.S.A. DELAWARE: *Pursh s.n.* (LECTOTYPE: K; US, photo; ISOLECTOTYPE: US, fragment).

Occasional specimens approach *Coleataenia rigidula* ssp. *rigidula* but can be distinguished by the stipitate upper lemma.

DICHANTHELIUM SECTION ANGUSTIFOLIA

Dichanthelium neuranthum (Griseb.) LeBlond, comb. nov. BASIONYM: *Panicum neuranthum* Griseb., Cat. Pl. Cub. 232. 1866. *Dichanthelium aciculare* (Desvaux ex Poiret) Gould & C.A. Clark ssp. *neuranthum* (Griseb.) Freckmann & Lelong, Sida 20:167. 2002. TYPE: CUBA: Oriente, 1860, *Wright 3453* (LECTOTYPE: US).

Panicum ovinum Scribn. & J.G. Sm., Circ. Div. Agrostol. U.S.D.A. 16:3. 1899. TYPE: U.S.A. TEXAS. Waller Co.: 25 May 1898, *Thurow s.n.* (HOLOTYPE: US).

Panicum pinetorum Swallen, Proc. Biol. Soc. Wash. 55:93. 1942. TYPE: U.S.A. FLORIDA. Lee Co: open pine woods near Bonita Springs, 14 Oct 1940, *Silveus 6604* (HOLOTYPE: US; ISOTYPE: TEX, US).

Panicum ridivivum Trin. ex Steud., Nomencl. Bot., ed. 2:262. 1841, nomen nudum. TYPE: MEXICO: Hacienda de la Laguna, n.d., *Schiede 37* (HOLOTYPE: LE; ISOTYPE: US, fragment ex LE).

Dichanthelium neuranthum is another uncommon to rare species that may be overlooked because of its resem-

blance to other taxa, especially the autumnal form of *D. aciculare* (Desvaux ex Poiret) Gould & C.A. Clark and vernal form of *D. caerulescens* (Hackel ex Hitchcock) Correll. It appears to be most closely related to *D. aciculare* and has commonly been placed in synonomy with that taxon. *Dichanthelium neuranthum* is distinguished from *D. aciculare* by having glabrous internodes and sheaths (at least the lower pubescent to villous in *D. aciculare*), vernal blades 5–15 cm long (4–8 cm in *D. aciculare*) and first glumes 0.7–1.0 mm long (0.6–0.8 mm in *D. aciculare*). The mature panicle in *D. neuranthum* is often no more than 0.5–2 cm wide, especially among populations along the Atlantic Coastal Plain, with erect-ascending branches and sub-secund spikelets few in number. *Dichanthelium neuranthum* is most readily distinguished from the vernal form of *D. caerulescens* by having pubescent spikelets 1.8–2.2(–2.8) mm long (glabrous and 1.4–1.8 mm in *D. caerulescens*), longer first glumes (0.3–0.8 mm in *D. caerulescens*), leaves 15–20 or more times as long as wide (10–15 times as long in *D. caerulescens*), and usually narrower panicles. *Dichanthelium caerulescens* panicle branches also ascend, but not as strictly as they frequently do in *D. neuranthum*. Both taxa are found in maritime wet grasslands on the Outer Banks of North Carolina.

Plants treated as *Panicum ovinum* Scribn. & J.G. Sm. and found from Arkansas to Mexico are treated here as belonging to *D. neuranthum*. They appear to differ only in having spikelets slightly longer (2.1–2.2 mm) than those found in Atlantic Coastal Plain populations (1.8–2.0 mm long), by distribution, and perhaps by habitat, described as dry or moist open ground, prairies, and swales (Silveus 1942). A population of *D. neuranthum* found June 2009 in a barrens in Union County, North Carolina, belongs to "*P. ovinum*."

Plants from populations in open pine woods in Charlotte and Lee counties, Florida, with spikelets 2.3–2.8 mm long but otherwise resembling *D. neuranthum* were described as *Panicum pinetorum* Swallen. They need additional study, and may be distinct. No populations of *D. neuranthum* with spikelets exceeding 2.2 mm in length have been seen elsewhere.

Distribution and habitat.–Dichanthelium neuranthum occurs locally from North Carolina to Florida, and west to east Texas and Arkansas. It is also found in Mexico, the Bahamas, Cuba, and Belize. Along the Atlantic and Gulf coasts, it is primarily found in maritime wet grasslands and wet pineland savannas near the coast, especially those with a calcareous influence. Plants referable to *Panicum ovinum* occur inland in dry to moist open ground, prairies, and swales from east Texas to Mississippi and Arkansas, and in Mexico, with a disjunct occurrence in the Piedmont of North Carolina.

SECTION **CLANDESTINA**

Dichanthelium cryptanthum (Ashe) LeBlond, comb. nov. BASIONYM: *Panicum cryptanthum* Ashe, North Carolina Agric. Exp. Sta. Bull. 175:115. 1900. *Panicum scabriusculum* Elliott var. *cryptanthum* (Ashe) Gleason, Phytologia 4:21. 1952. TYPE: U.S.A. NORTH CAROLINA. Johnston Co.: swamps at Wilson's Mill, 15 Jul 1897, *Ashe s.n.* (LECTOTYPE: NCU!; ISOLECTOTYPE: NCU!, US!).

Dichanthelium cryptanthum is a distinctive and uncommon to rare witch grass found from New Jersey to Texas. It shares with *D. scabruisculum* (Elliott) Gould & C.A. Clark (sensu stricto) glabrous internodes, a scabrous peduncle, membranous ligules, and ovate-acute spikelets, but differs in several characters. Culms in *D. cryptanthum* are less than 2 mm in diameter above the base while more than 2 mm in *D. scabriusculum*. The lowest nodes are usually retrorsely bearded (glabrous to pubescent in *D. scabriusculum*, or rarely bearded). The ligule is 0.3–0.6 mm long in *D. cryptanthum* and 0.5–1.3 mm long in *D. scabriusculum*. Largest leaves in *D. cryptanthum* are 7–12(–16) cm by 6–9 mm while those of *D. scabriusculum* are 10–25 cm by 8–15 mm. The panicle rachis, branches, and pedicels of *D. cryptanthum* are scabrous and lack pellucid punctations, while these features are smooth and pellucid-punctate in *D. scabriusculum*. Spikelets of *D. cryptanthum* are 2.0–2.4 mm long, compared to 2.1–2.8 mm in *D. scabriusculum*. The first glume in *D. cryptanthum* is 0.7–1.1 mm long, lanceolate, and with a blunt to acute apex. In *D. scabriusculum*, the first glume is 0.3–0.6(–0.8) mm long, reniform to suborbicular (rarely lanceolate), and with a truncate to obtuse apex. *Dichanthelium cryptanthum* resembles a large member of the *D. dichotomum* group and can be mistaken for *D. yadkinense* (Ashe) Mohlenbrock. The latter is readily distinguished by its smooth peduncle and ciliate ligule.

Distribution and habitat.—Dichanthelium cryptanthum occurs locally in the Atlantic and Gulf Coastal

Plain from Virginia to Texas and disjunctly in New Jersey. It is found in a variety of wetland habitats, including small streams, spring heads, seeps, and swamps, especially where the habitat is kept open by fire or repeated disturbance.

SECTION **ENSIFOLIA**

Dichanthelium curtifolium (Nash) LeBlond, comb. nov. BASIONYM: *Panicum curtifolium* Nash, Bull. Torrey Bot. Club 26:569. 1899. *Panicum ensifolium* Baldwin ex Elliott var. *curtifolium* (Nash) Lelong, Brittonia 36:266. 1984. *Dichanthelium ensifolium* (Baldwin ex Elliott) Gould ssp. *curtifolium* (Nash) Freckmann & Lelong, Sida 20:170. 2002. TYPE: U.S.A. MISSISSIPPI. Jackson Co.: Ocean Springs, 2 May 1898, *Tracy 4598* (HOLOTYPE: NY; ISOTYPE: US!).

Panicum austromontanum Ashe, J. Elisha Mitchell Sci. Soc. 16:85. 1900. TYPE: U.S.A. ALABAMA. Jackson Co.: Sand Mountain, Jun 1899, *Ashe s.n.* (LECTOTYPE: US).

Dichanthelium curtifolium has morphological features that appear to link it with two or three sections; this, combined with its restricted and disjunct distribution, may have contributed to conflicting or ambiguous treatments. The bearded nodes suggest a relationship with sections *Dichanthelium* (formerly sect. *Dichotoma*) or *Lanuginosa*, while leaf size, shape, number, and disposition on delicate culms suggest a relationship with sect. *Ensifolia*. The length of the hairy ligule, 1–2 mm, is longer than that of any other taxon in sections *Dichanthelium* and *Ensifolia*, all of which have ciliate ligules at most 1 mm long. The combination of ligule length and spreading sheath pubescence may explain why Gould and Clark (1978) placed *Panicum curtifolium* within their concept of *D. acuminatum* (Sw.) Gould & C.A. Clark var. *implicatum* (Scribn.) Gould & C.A. Clark in sect. *Lanuginosa*. Correll & Johnston (1970) describe *curtifolium* as "basically *P. ensifolium* as to genetic constitution, but contaminated by something like the *P. spretum-P. lindheimeri* complex." Spikelets can be pubescent or glabrous. It is quite possible that *D. curtifolium* is of hybrid origin, but at least some populations occur in distinctive habitats where putative parents are not present.

Plants assigned to *Panicum earlei* Nash were treated in synonymy with *P. curtifolium* by Hitchcock & Chase (1910) and others. The isotype at NCU has glabrous spikelets 1.2–1.3 mm long and bearded nodes, but the internodes as well as sheaths are spreading-hairy and the ligules are 2–2.5 mm long. These plants appear to be more closely related to sect. *Lanuginosa* and are in need of additional study.

Distribution and habitat.—*Dichanthelium curtifolium* ranges sporadically along the Atlantic and Gulf Coastal Plain from South Carolina and Florida west to east Texas and also occurs in the Appalachian Province in North Carolina, Tennessee, and Alabama. It prefers moist shady places and bogs and has been collected in saturated to shallowly inundated streamhead swamps associated with seepage bogs in the Coastal Plain, and in grass-sedge bogs and along mountain streams in the Appalachian Province. Although Hitchcock & Chase (1910, 1950) did not include North Carolina in the distribution of *P. curtifolium*, Hitchcock & Chase (1910) included in synonymy a specimen of *Panicum austromontanum* Ashe "from western North Carolina," and a specimen of *D. curtifolium* was found in Clay Co., NC, in 1956 by H.E. Ahles and A.E. Radford (NCU!).

SECTION **LANCEARIA**

Dichanthelium webberianum (Nash) LeBlond, comb. nov. BASIONYM: *Panicum webberianum* Nash, Bull. Torrey Bot. Club 23:149. 1896. TYPE: U.S.A. FLORIDA. Lake Co.: vicinity of Eustis, 16–31 May 1894, *Nash 781* (ISOTYPE: US!).

Panicum onslowense Ashe, J. Elisha Mitchell Sci. Soc. 16:88. 1900. TYPE: U.S.A. NORTH CAROLINA. Onslow Co.: near Ward's Mill, 19–22 May 1899, *Ashe s.n.* (ISOTYPE: US, fragment). As noted by Hitchcock and Chase (1910), some specimens (e.g., NCU!) distributed as *Panicum onslowense* "and bearing the same data as the type" belong to *Panicum lancearium* Trin.

Dichanthelium webberianum is distinguished from other members of sect. *Lancearia* by its distinctly papillose lemma and palea and larger lower culm and rosette blades. The glabrous culm blades often exceed a centimeter in width, and larger winter rosette blades are 3–8 cm long, compared to 1–2.5(–5) cm in *D. portoricense* sensu lato. Culm internodes are often glabrous (commonly so in the Cape Fear Arch region of the Carolinas) compared to minutely and densely puberulent internodes in other members of the section. *Dichanthelium webberianum* spikelets are longer than those of *D. portoricense* var. *portoricense* (2.1–2.6 mm vs. 1.5–1.8 mm), but

populations of plants in Florida with smooth fertile lemmas and the vegetative characteristics of *D. portoricense* ssp. *patulum* have spikelets up to 2.6 mm long. These include plants referable to *Panicum patentifolium* Nash, which have rosette blades up to 5 cm long but with culm blades no wider than 5 mm. They need additional study.

Distribution and habitat.—D. webberianum occurs locally on the coastal plain from southeastern North Carolina to peninsula Florida. It is found in wet longleaf pine flatwoods and savannas.

LEPTOCHLOA

Leptochloa maritima (E.P. Bicknell) LeBlond & Sorrie, comb. nov. BASIONYM: *Diplachne maritima* E.P. Bicknell, Bull. Torrey Bot. Club 35:195. 1908. *Leptochloa fascicularis* (Lam.) A. Gray var. *maritima* (E.P. Bicknell) Gleason, Phytologia 4:21. 1952. TYPE: U.S.A. MASSACHUSETTS. Nantucket Co.: sandy shores of Sachacha Pond, 16 Sep 1899, *Bicknell s.n.* (LECTOTYPE: NY).

Festuca procumbens Muhl, Descr. Gram. 160. 1817. *Diachroa procumbens* (Muhl.) Nutt., Trans. Amer. Philos. Soc., n.s., 5:147. 1837. *Diplachne procumbens* (Muhl.) Nash, Man. Fl. N. States 128. 1901, nom illeg., non *Diplachne procumbens* Arechav. (1894). TYPE: U.S.A.: Carolina, *Muhlenberg* 235 (HOLOTYPE: PH).

Leptochloa maritima is distinguished from *L. fascicularis* (Lam.) A. Gray and other members of the *L. fusca* (L.) Kunth complex primarily by its shorter ligules, long-attenuate to awned longer glumes, and longer lemmas and lemma awns. It is specifically distinguished from *L. fascicularis* as follows:

1. Ligules 2–5 mm long; glumes long-attenuate to awned; first glume 2.5–3.5 mm long, second glume 4–7 mm long; lemmas (3–)4–8 mm long; lemma awns (1–)2.5–5 mm long _____ **Leptochloa maritima**
1. Ligules 5–7 mm long; glumes acute, awnless; first glume 1.3–2.7 mm long, second glume 2.2–4.0 mm long; lemmas 2–4 mm long; lemma awns 0.5–1.2 mm long _____ **Leptochloa fascicularis s.s.**

Leptochloa maritima was included in *L. fusca* (L.) Kunth ssp. *fascicularis* (Lam.) N.W. Snow by Snow (2003). He did not recognize entity "*maritima*" "because long [lemma] awns and salinity tolerance are common throughout the species." We find that the combination of characters cited above are consistent throughout the New Hampshire to Florida range. Maximum lemma length in *L. maritima* (8 mm) exceeds the maximum given by Snow for *L. fusca* sensu lato (6 mm). Maximum lemma awn length in *L. maritima* (5 mm) exceeds that given by Snow for his concept of *L. fusca* ssp. *fasciculata* (3.5 mm), as does maximum second glume length for *L. maritima* (7 mm) and *L. fusca* ssp. *fasciculata* (5 mm).

Distribution and habitat: Leptochloa maritima ranges from New Hampshire to Florida. It most frequently occurs on exposed peat and organic muck at or near the coast where vegetation is sparse or of low stature. Habitats include fresh to brackish marshes and overwash flats, edges of tidal creeks, exposed beds of natural and man-made ponds and pools, and interdune wetlands.

THELYPTERIDACEAE

STEGNOGRAMMA

There is an increasing consensus in the pteridological community to accept various long-proposed segregates of *Thelypteris* Schmidel, sensu latissimo. In the southeastern United States, only one member of the segregate genus *Stegnogramma* Blume is present, the remarkable "Alabama shield fern," usually in the past called *Thelypteris pilosa* (M. Martens & Galeotti) Crawford var. *alabamensis* Crawford, and transferred to *Stegnogramma* as *Stegnogramma pilosa* (M. Martens & Galeotti) K. Iwats. var. *alabamensis* (Crawford) K. Iwats.. However, Watkins and Farrar (2002, 2005) make a convincing case for its status as an ancient relictual taxon warranting specific rank, which they established as *Thelypteris burksiorum* J.E. Watkins & D.R. Farrar. Following these recent studies, we accept generic status for *Stegnogramma* and specific rank for the Alabama shield fern, thus necessitating the following new combination.

Stegnogramma burksiorum (J.E. Watkins & D.R. Farrar) Weakley, comb. nov. BASIONYM: *Thelypteris burksiorum* J.E. Watkins & D.R. Farrar, Amer. Fern J. 92:172 (171–178; figs. 1–4), 2002. TYPE: U.S.A. ALABAMA. Winston Co.: in fissures of Pottsville sandstone, on the west fork of Sipsey River 5 mi E of Double Springs, *J.E. Watkins* 797 (NY).

Thelypteris pilosa (M. Martens & Galeotti) Crawford var. *alabamensis* Crawford; *Stegnogramma pilosa* (M. Martens & Galeotti) K. Iwats. var. *alabamensis* (Crawford) K. Iwats.

VITACEAE

MUSCADINIA

In the past decade, a number of molecular phylogenetic studies of the Vitaceae have been undertaken, using different genes and different sampling within the family; overall, they all corroborate the clear distinction of the muscadines (scuppernongs) from the true grapes. Some studies suggest that muscadines are sister to *Vitis* L. sensu stricto, while others show equivocal results as to whether *Muscadinia* + *Vitis* is a monophyletic group. Overall, and even if *Muscadinia* is basal to but forms a monophyletic clade with *Vitis* sensu stricto, recognition of *Muscadinia* at generic rank is warranted, based on the long-recognized morphological distinctiveness of *Muscadinia* vs. *Vitis* sensu stricto (tendrils simple vs. bifid or trifid; bark adherent and with prominent lenticels vs. bark shredding and with inconspicuous lenticels; pith continuous through nodes vs. pith interrupted by nodal diaphragms; leaves small, coarsely dentate, and never deeply lobed vs. leaves large, finely serrate, and usually deeply lobed), the genetic distance of it from *Vitis* sensu stricto, the close relationships of taxa within *Vitis* sensu stricto and their rampant interfertility, the different chromosome numbers (40 in *Muscadinia*, 38 in *Vitis* sensu stricto), the frequent past and current recognition of *Muscadinia*, and the standards of morphological distinctiveness of genera in the Vitaceae (Brizicky 1965; Ren et al. 2011; Péros et al 2011; Tröndle et al. 2010; Rossetto et al. 2002; Soejima & Wen 2006).

The classification of muscadine species and lower level taxa has also been variable. For the southeastern United States, Small (1933) recognized 2 species (in *Muscadinia*): *Muscadinia rotundifolia* (Michaux) Small and *M. munsoniana* (J.H. Simpson ex Planch.) Small, and this "two species scheme" has also been employed in *Vitis* as well: *Vitis rotundifolia* Michaux and *V. munsoniana* J.H. Simpson ex Planch. For instance, Correll and Correll (1982) commented that "the larger berries of that species [*V. rotundifolia*], however, with their tough thick skin and musky sweet pulp are strikingly different from those of our species [*V. munsoniana*]." On the other extreme, Wunderlin and Hansen (2011) lump *V. munsoniana* into *V. rotundifolia* without varietal status or comment. Moore (1988) commented that the "characters used to distinguish *V. munsoniana* from *V. rotundifolia*, particularly leaf size, appear to intergrade abundantly, making assignment of intermediate individuals to one species or the other most difficult." In 1991, Moore followed this up by treating the "*munsoniana* entity" at varietal rank and making the new combination necessary to do so (Moore 1991).

Our perception is that these two entities are easily distinguished in the core of their distributions ("*rotundifolia*" in most of the southeastern United States, "*munsoniana*" in southern Florida and the Bahamas), but that in northern Florida and adjacent southern Georgia and southern Alabama a rather broad zone of intermediate and difficult-to-place material is encountered, as noted by Moore (1988, 1991). This fits with our concept of entities that should be recognized at varietal rank. In addition, Ward (2006) makes a persuasive case that an additional entity, previously studied and recognized but not formally named, is another narrowly endemic taxon of the scrub of the Florida central ridge: *Vitis rotundifolia* Michx. var. *pygmaea* McFarlin ex D.B. Ward.

The only other taxon of muscadine is *Vitis popenoei* J.L. Fennell of southern Mexico and northern Central America; its differences in morphology and distribution support its specific distinction from the taxa of the southeastern United States and West Indian discussed above. In order to accommodate the treatment of muscadines as warranting generic status as the genus *Muscadinia*, and the distinction of "*munsoniana*" and "*rotundifolia*" at varietal rank in *Muscadinia*, we make the following combinations.

Muscadinia rotundifolia (Michx.) Small var. **munsoniana** (J.H. Simpson ex Planch.) Weakley & Gandhi, comb. et stat. nov. BASIONYM: *Vitis munsoniana* J.H. Simpson ex Planch. in A.L.P.P. de Candolle & A.C.P. de Candolle, Monogr. Phan. 5:615. 1887. *Vitis rotundifolia* Michx. var. *munsoniana* (J.H. Simpson ex Planch.) M.O. Moore; *Muscadinia munsoniana* (J.H. Simpson ex Planch.) Small. TYPE: U.S.A. FLORIDA. Manatee Co.: collected along Manatee River, 1883, 1885, 1887, *J.H. Simpson*, cultivated Munson vineyard, Denison, Texas, 1890, [LECTOTYPE, designated by M.O. Moore (1991): PH].

Muscadinia rotundifolia (Michx.) Small var. **pygmaea** (McFarlin ex D.B. Ward) Weakley & Gandhi, comb. nov. BASIONYM: *Vitis rotundifolia* Michx. var. *pygmaea* McFarlin ex D.B. Ward, Phytologia 88:219. 2006.TYPE: UNITED STATES. FLORIDA. Highlands Co.: sand dunes, Lake Jackson, Sebring, *J.B. McFarlin* 5707, 9 Jun 1931 ["flowers"] (HOLOTYPE: US 1728170). PARATYPES: FLORIDA. Highlands Co.: sand dunes, Lake Jackson, Sebring, *J.B. McFarlin* 6524, 15 Aug 1931 ["fruits"] (US 1728171).

Muscadinia popenoei (J.L. Fennell) Weakley & Gandhi, comb. nov. BASIONYM: *Vitis popenoei* J.L. Fennell, J. Wash. Acad. Sci. 30:17, fig. 2, 1940.

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