

TAXONOMIC ADJUSTMENTS IN THE *DICHANTHELIUM ACUMINATUM* COMPLEX (POACEAE: PANICOIDEAE)

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ABSTRACT

Panicum glutinoscabrum Fernald, *P. olivaceum* Hitch. & Chase, and *P. thurowii* Scribn. & J.G. Sm. are here transferred to *Dichanthelium*: ***Dichanthelium glutinoscabrum*** (Fernald) Wipff; ***Dichanthelium olivaceum*** (Hitchc. & Chase) Wipff; and ***Dichanthelium thurowii*** (Scribn. & J.G. Sm.) Wipff. A key to the species in the *D. acuminatum* complex is provided.

RESUMEN

Panicum glutinoscabrum Fernald, *P. olivaceum* Hitch. & Chase, y *P. thurowii* Scribn. & J.G. Sm. se transfieren aquí a *Dichanthelium*: ***Dichanthelium glutinoscabrum*** (Fernald) Wipff; ***Dichanthelium olivaceum*** (Hitchc. & Chase) Wipff; y ***Dichanthelium thurowii*** (Scribn. & J.G. Sm.) Wipff. Se proporciona una clave para las especies del complejo *D. acuminatum*.

Hitchcock and Chase (1910) recognized 17 informal groups in subg. *Dichanthelium*, 109 species and 5 varieties. Radford et al. (1968) reduced the number of recognized taxa in *Panicum* subg. *Dichanthelium*. Gould and Clark (1978) made many more reductions in the number of recognized taxa, which they even admitted was “somewhat arbitrary and certainly not entirely satisfactory.” Subsequent work has determined that Radford et al. (1968) and Gould and Clark (1978) had been overzealous reductions (e.g., LeBlond 2001, 2016, 2017, 2018; Thomas 2008, 2015; Ladd & Thomas 2015). Ladd and Thomas (2015) stated that even the treatment of “... Freckmann and Lelong (2003), does not accurately reflect the morphological entities, ecological performance, and taxonomic relationships of the group. Time and again, morphologically and ecologically distinct entities are subsumed into broad “species,” in the process disenfranchising then meaningful ecological information about habitat affinities and distinctness that are of value in assessing vegetation and habitat conditions. Recent studies (e.g., Thomas 2008[, 2015]) and detailed field assessments support maintaining some narrower species concepts within the group.” Since 1978, an increasing number of the *Panicum* subg. *Dichanthelium* taxa treated in synonymy by Radford et al. (1968) and Gould and Clark (1978) are now recognized as valid species, subspecies, or varieties in *Dichanthelium* (e.g., Mohlenbrock 1985, 2001, 2015; Freckmann & Lelong 2002, 2003; LeBlond 2001, 2016, 2017, 2018; Ladd & Thomas 2015; Thomas 2015, 2017, 2018; Greuter & Rankin Rodríguez 2016; Wilhelm & Rericha 2016; Wipff & Shaw 2018; Wipff 2020). As this very complex group is better understood morphologically and ecologically, more of the *Panicum* subg. *Dichanthelium* taxa treated by Hitchcock and Chase (1910, 1915) and Hitchcock (1915, 1951) are being reinstated to specific rank and transferred to *Dichanthelium*.

During the preparation of the second edition of the Guide to Texas Grasses, Texas A&M University Press, it is necessary to make nomenclatural changes to coincide with the author's concept of the taxa involved. The *Dichanthelium* treatment for Texas will more reflect the circumscription of species as treated by Hitchcock and (1910) and Hitchcock (1915, 1951). The following taxa, formerly recognized in *Panicum* subg. *Dichanthelium*, are morphologically and ecologically distinctive, and are here transferred to *Dichanthelium*. Also, *Panicum glutinoscabrum*, a very distinctive species found in bogs is here reinstated to the rank of species.

Dichanthelium glutinoscabrum (Fernald) Wipff, **comb. nov.** BASIONYM: *Panicum glutinoscabrum* Fernald, Rhodora 49(581):122, pl. 1059 (1947). TYPE: U.S.A. VIRGINIA. Nansemond Co.: sphagnum and peaty bog by Norfolk and Western Railway, ca. 1/2 mi W of Kilby, 8, 12 Sep 1946, Fernald, Long, & Clement 15186 (HOLOTYPE: GH, barcode GH00936764, image!; ISOTYPES: GH,

barcode GH00023446, image!; NYBG, barcode NY00381612, image!; PH, barcode PH00018659 image!; PH, barcode PH00018658, image!; US, barcode US00147855, image!).

Note.—There are two type specimens in GH. For plate 1059, in the protologue (Fernald 1947), the photograph matches the specimen with barcode number GH00936764 and was designated by Fernald as being of the type specimen in the figure description of plate 1059.

Dichanthelium glutinoscabrum is a very distinct species found in sphagnum and peaty bogs, and is apparently only known from the type location. Fernald (1947) said it best regarding this species, “*Panicum glutinoscabrum* is a perplexing plant to orient. In the general characters of inflorescence and relatively few primary nodes and autumnal axillary branches it seems to belong to sub § Lanuginosa, but its very glutinous or viscid quality is apparently unique. The blackish wart-like secreting glands which abound, especially on the sheaths and leaf-blades, are a striking character, the sheaths and internodes of the culm being scabridulous.” The species is 70–90 cm tall; culms erect. This species is taller than the other taxa in the complex.

Dichanthelium olivaceum* (Hitchc. & Chase) Wipff, *comb. nov. BASIONYM: *Panicum olivaceum* Hitchc. & Chase, Contr. U.S. Natl. Herb. 15:225–226, fig. 234 (1910). TYPE: GUATEMALA: Alta Vera Paz: Coban, 1400 m, Feb 1888, *H. von Türkheim* 428 (HOLOTYPE: US, accession US-823209, barcode US00147922, image!; ISOTYPES: GH, barcode GH00024121, image!; K, barcode K000309156, image!).

Dichanthelium olivaceum is distinguished from *D. acuminatum* (Swartz) Gould & Clark as follows. *Dichanthelium olivaceum* is dark-green or olive-green when dry; vernal culms 15–42 cm tall, erect or somewhat spreading at base; spikelets 1.9–2 mm long; lower glume 1/4–1/3 the length of the spikelet, usually irregularly pointed; upper glume shorter than the spikelet; autumnal form is bushy, the branches evenly distributed, not gathered into distinct fascicles as in *D. acuminatum*; autumnal form is upright or becoming decumbent spreading, the decumbent culms curved upward; secondary branches forming before the maturity of the primary panicle, branching freely from lower nodes, the reduced branches appressed; the reduced leaf blades flat, 1–2 cm long, 2–4 mm wide; growing in clay or gravelly soil, in open areas and slopes, between 1,000–2,200 m elevation, from Mexico to Venezuela.

Dichanthelium acuminatum is light-green or yellow-green when dry; vernal culms 20–40(–70) cm tall; culms leafy, ascending from a geniculate base; spikelets 1.8–1.9 mm long; lower glume 1/3 as long as spikelet, subacute; upper glume as long as the spikelet; the autumnal phase forms early, before maturity of primary panicle; primary culms branching at all but the uppermost nodes before the maturity of the primary panicles, these branches often exceeding the culm, more or less zigzag, repeatedly branching with the ultimate branchlets forming dense, short, flabellate fascicles; the reduced leaf blades flat or involute-pointed; growing in sandy, pine woods in the SE U.S. Coastal Plain, Caribbean and Columbia.

Dichanthelium thurowii* (Scribn. & J.G. Sm.) Wipff, *comb. nov. BASIONYM: *Panicum thurowii* Scribn. & J.G. Sm., Circ. Div. Agrostol. U.S.D.A. 16:5 (1899) [1 Jul]. *Dichanthelium acuminatum* (Swartz) Gould & Clark var. *thurowii* (Scribn. & J.G. Sm.) Gould & Clark, Ann. Missouri Bot. Gard. 65:1125. 1978. *Panicum acuminatum* Swartz var. *thurowii* (Scribn. & J.G. Sm.) Reed, Phytologia 67:452. 1989. TYPE: U.S.A. Texas: Waller Co.: 5 Jun 1898, *F.W. Thurow* 9 (HOLOTYPE: US, accession US-2383622, barcode US00148059, image!).

Dichanthelium thurowii is distinguished from *D. acuminatum* by a number of characters. The vernal form of *Dichanthelium thurowii* is bluish green, but drying olive green and is often purplish; vernal leaf blades with upper surface glabrous to sparingly pilose toward the base; lower glume is 1/5 the length of the spikelet, obtuse or irregularly pointed; the autumnal phase forms after the maturity of the primary panicle; the primary culms are erect, sparingly branched from middle nodes; the few secondary branches are appressed or ascending, becoming fascicled, and are scarcely longer than the primary internodes; the autumnal leaf blades are reduced, flat or somewhat involute at the tips; growing in sandy, prairies and dry open woods from Alabama to eastern Texas.

Dichanthelium acuminatum is light-green or yellow-green when dry; vernal leaf blades, upper surface, from appressed papillose pubescent to long-villous; lower glume 1/3 as long as spikelet, subacute; the

autumnal phase forms early, before maturity of primary panicle; primary culms branching at all but the uppermost nodes before the maturity of the primary panicles, these branches often exceeding the culm, more or less zigzag, repeatedly branching with the ultimate branchlets forming dense, short, flabellate fascicles; the reduced leaf blades flat or involute-pointed; growing in sandy, pine woods in the SE U.S. Coastal Plain, Caribbean and Columbia

KEY TO THE SPECIES IN THE *DICHANTHELIUM ACUMINATUM* COMPLEX

Thomas (2015) demonstrated that *D. acuminatum* s.l. is a morphologically distinct group from other members of sect. *Lanuginosa* (Hitche.) Freckmann & Lelong. This group differs in that the stems and leaves (at least abaxially) are densely pubescent; has a double ligule consisting of a short true ligule backed by a conspicuous pseudoligule; and, unlike all other members of the section, has conspicuous marginal cilia that typically extend at least half way up the margins of vernal leaf blades. These marginal hairs have pustulate bases that can be detected even in older specimens that have lost the hairs. But care must be taken in determining this diagnostic character since abaxial hairs are easily misinterpreted as originating from the margin, so caution and microscopy are recommended.

1. Spikelets 1.2–1.4(–1.5) mm long; upper floret 1.1–1.2 mm long _____ **D. auburne**
1. Spikelets (1.6–)1.7–2.1 mm long; upper floret 1.3–1.7 mm long.
 2. Plants 70–90 cm tall, erect; sheaths glutinous or viscid; growing in sphagnum and peaty bogs, endemic to Virginia, U.S.A. _____ **D. glutinoscabrum**
 2. Plants ≤70 cm tall, erect to decumbent-spreading; sheaths not glutinous; growing in sandy, clay or gravelly soils, usually well drained.
 3. Plants light-green or yellow-green when dry; lower glume 1/3 as long as spikelet, subacute; autumnal form appearing early; primary culms branching at all but the uppermost nodes before the maturity of the primary panicles, these branches often exceeding the culm, more or less zigzag, repeatedly branching, the ultimate branchlets in dense, short, flabellate fascicles; the reduced blades flat or involute-pointed; growing in sandy, pine woods in the SE U.S. Coastal Plain, Caribbean and Columbia _____ **D. acuminatum**
 3. Plants dark-green or olive-green when dry, sometimes purplish; lower glume 1/5–1/3 as long as spikelet, obtuse and irregularly pointed; autumnal form appearing early or late; primary culms either branching from middle nodes or freely branching from lower nodes; reduced leaf blades flat to involute-pointed; growing in sandy, clay or gravelly soil; growing in SE U.S. Coastal Plain; Mexico to Venezuela.
 4. Autumnal form erect, forming after the maturity of the primary panicle; primary culms sparingly branched from middle nodes, the few branches are appressed or ascending fascicled, branches scarcely longer than the primary internodes; the reduced blades flat or somewhat involute at the tips; vernal leaf blades, upper surface glabrous or sparingly pilose near base of leaf blade; leaves and spikelets often purplish; lower glume 1/5 the length of the spikelet, obtuse or irregularly pointed; growing in sandy, prairies and dry open woods from Alabama to eastern Texas _____ **D. thurowii**
 4. Autumnal form upright or becoming decumbent spreading, the decumbent culms curved upward; secondary branches forming before the maturity of the primary panicle, branching freely from lower nodes, the reduced branches appressed; the reduced leaf blades flat, 1–2 cm long, 2–4 mm wide; vernal leaf blades pubescent on both surfaces; plants not purplish; lower glume 1/4–1/3 the length of the spikelet, irregularly pointed; growing in clay or gravelly soil, in open areas and slopes, between 1,000–2,200 m elevation, from Mexico to Venezuela _____ **D. olivaceum**

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