

TAXONOMIC CHANGES IN *DICHANTHELIUM* (POACEAE: PANICEAE) IN THE PACIFIC NORTHWEST

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ABSTRACT

Panicum brodiei H. St. John, *Panicum occidentale* Scribn., *Panicum pacificum* Hitchc. & Chase, and *Panicum shastense* Scribn. & Merr. are here transferred to *Dichanthelium*: ***Dichanthelium brodiei*** (H. St. John) Wipff, **comb. nov.**, ***Dichanthelium occidentale*** (Scribn.) Wipff, **comb. nov.**, ***Dichanthelium pacificum*** (Hitchc. & Chase) Wipff, **comb. nov.**, and ***Dichanthelium shastense*** (Scribn. & Merr.) Wipff, **comb. nov.** A key to the species in the Pacific Northwest of the USA is provided.

Hitchcock and Chase (1910) recognized 17 informal groups in subg. *Dichanthelium* Hitchc. & Chase, 110 species, and 5 varieties in North America. Fernald (1934), Radford et al. (1968), and Spellenberg (1975) reduced the number of species recognized in *Panicum* subg. *Dichanthelium*. Gould (1974) elevated *Panicum* subg. *Dichanthelium* to generic rank but also made a number of reductions in the number of recognized species in this new genus. 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 Fernald (1934), Radford et al. (1968), and Gould and Clark (1978) had been overzealous in 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 them of 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 that were treated in synonymy or reduced to an infraspecific rank by Fernald (1934), Radford et al. (1968), Gould (1974), and Gould and Clark (1978) are now recognized as valid species in *Dichanthelium* (e.g., Mohlenbrock 1985, 2001, 2014, 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, 2022). As this very complex group is better understood morphologically and ecologically, more of the subg. *Dichanthelium* taxa treated by Hitchcock and Chase (1910, 1915) and Hitchcock (1915, 1951) are being reinstated to specific rank and transferred to *Dichanthelium*. The following taxa, formerly recognized in *Panicum* subg. *Dichanthelium*, are morphologically and ecologically distinctive, and are here transferred to *Dichanthelium*.

1. **DICHANTHELIUM BRODIEI** (H. St. John) Wipff, **comb. nov.** *Panicum brodiei* H. St. John, Fl. SE Washington 51. 1937. **TYPE: USA. Washington.** Wawawai, Snake River, 1898, *Brodie s.n.* (holotype: WS; isotypes: NY, US). Images of all seen.
2. **DICHANTHELIUM OCCIDENTALE** (Scribn.) Wipff, **comb. nov.** *Panicum occidentale* Scribn., Rep. (Annual) Missouri Bot. Gard. 10: 48. 1899. **TYPE: CANADA. British Columbia.** Nootka Sound, no date, *T. Haenke s.n.* (holotype: PR; isotypes: MO, US, W). Images of all seen.

3. **DICHANTHELIUM PACIFICUM** (Hitchc. & Chase) Wipff, **comb. nov.** *Panicum pacificum* Hitchc. & Chase, Contr. U.S. Natl. Herb. 15: 229, f. 241. 1910. **TYPE: USA. California.** Shasta Co.: Castle Crag, 1/4 mi W of hotel, in moist places in woods, 3 Aug 1908, A.S. Hitchcock 3070 (Amer. Gr. Nat. Herb. 136) (holotype: US; isotypes: BR, CAS, DAO, F, GH, K, NY, PH, S, W). Images of all seen.
4. **DICHANTHELIUM SHASTENSE** (Scribn. & Merr.) Wipff, **comb. nov.** *Panicum shastense* Scribn. & Merr., Circ. Div. Agrostol. U.S.D.A. 35: 3-4. 1901. **TYPE: USA. California.** Shasta Co.: In a moist meadow at the edge of pine forests at Castle Crag, near Mt. Shasta, June 1899, L.A. Greata s.n. (holotype: US). Image seen.

Key to Pacific Northwest species

1. Plants restricted to hot geothermal soils of the Cascade and Rocky Mountains.
 2. Largest vernal stem leaves < 8 mm wide; pubescence on the vernal sheaths < 2 mm long **Dichanthelium thermale** (Bol.) J.R. Thomas subsp. **thermale**
 2. Largest vernal stem leaves > 8 mm wide; pubescence on the vernal sheaths > 2 mm long **Dichanthelium thermale** subsp. **sericeum** (Schmoll) J.R. Thomas
1. Plants never growing in hot geothermal soils.
 3. Spikelets > 3 mm long **Dichanthelium scribnerianum** (Nash) J.R. Thomas
 3. Spikelets < 3 mm long.
 4. Spikelets 2.4–2.6 mm long, 1.2–1.4 mm wide **Dichanthelium shastense**
 4. Spikelets ≤ 2 mm long, ≤ 1.1 mm wide.
 5. Vernal leaf blades adaxially papillose-pilose, with or without short hairs intermixed; spikelets 1.8–2 mm long; first glume 1/4–1/3 the length of the spikelet; autumnal form prostrate-spreading, repeatedly branching from middle and upper nodes **Dichanthelium pacificum**
 5. Vernal leaf blades adaxially glabrous, or nearly so, occasionally with a few long hairs near the base; spikelets ≤ 1.8 mm long; first glume ≤ 1/4 the length of the spikelet; autumnal form a spreading bunch or tussock, branching from lower nodes.
 6. Vernal leaf blades 5–7 mm wide, 4–8 cm long; lower glume 1/4 as long as the spikelet; sheaths sparsely papillose-pubescent to glabrous; ligules 3–4 mm long; nodes pubescent; upper internodes glabrate; Pacific NW **Dichanthelium occidentale**
 6. Vernal leaf blades 6–10 mm wide, 4–10 cm long; lower glume ≤ 1/6 as long as the spikelet; sheaths spreading pilose; ligules 5–7 mm long; nodes nearly glabrous; upper internodes pilose; found along Snake River **Dichanthelium brodiei**

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