NEW COMBINATIONS IN CENCHROPSIS, DICHANTHELIUM, AND STAPFOCHLOA (POACEAE)

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ABSTRACT

As part of ongoing work on the grasses of Texas, we propose the following taxonomic changes and nomenclatural updates — *Cenchropsis myosuroides* (Kunth) Nash var. *longiseta* (Caro & E.A. Sánchez) Wipff & Shaw, *combin. nov.;* *Cenchropsis ekmaniana* (A.S. Hitchcock) Wipff & Shaw, *combin. nov.;* *Dichanthelium ovinum* (Scribn. & J.G. Sm.) Wipff & Shaw, *combin. nov.;* *Stapfochloa parodiana* (Roseng. & Izag.) Wipff & Shaw, *combin. nov.;* and *Stapfochloa grandiflora* (Roseng. & Izag.) Wipff & Shaw, *combin. nov.*

As part of ongoing work on the *Guide to Texas Grasses* (Shaw & Wipff, in prep.) and on the grasses of Texas in general, it is necessary to discuss aspects of the taxonomy that we are adopting — changes in rank, generic transfers to allow for the use of generic concepts, new or old, reinstatement of genera and species previously lost to synonymy, and clarification of characters used to delineate difficult genera or species complexes.

Chemisquy & al. (2010) proposed the unification of *Cenchrus* and *Pennisetum* based on their phylogenetic analysis of morphological, plastid, and nuclear data. Respectfully, we find this very broad interpretation to be a difficult taxonomic tool. We are in congruence with Pohl (1980), Wipff (2001), and Denadío et al. (2009) that the morphological, cytological, cytogenetic and molecular data (Denadío et al. 2009) does support the delimitation of *Cenchrus*, in a strict sense, from *Pennisetum*, and the recognition of *Cenchrus myosuroides* in *Cenchropsis*. As stated, “We use all techniques and types of evidence we can to make the best decisions we can now. Ecology, biogeography, phenology, cytology, and other information, as available, pertains to the task. Molecular evidence is no silver bullet, and still requires just as much interpretation from all available evidence in order to make best possible taxonomic decisions” Weakley et al. (2017).

Delisle (1963) published a broad circumscription and taxonomy of the genus *Cenchrus* and its species. This taxonomy included species that were traditionally treated in *Pennisetum*. The broad treatment, however, was found to be a difficult and confusing taxonomic tool. Pohl (1980) and Wipff (2001) published a taxonomic treatment recognizing *Cenchrus* sensu stricto, from *Pennisetum*. Denadío et al. (2009) published a preliminary molecular phylogeny of *Pennisetum* and *Cenchrus*. In their discussion they state,

“If *Cenchrus ciliaris* and *C. setigerus* are treated under *Pennisetum*, based on a common basic chromosome number *x* = 9, and the presence of antorsely scabrous and not spiny bristles (Wipff 2003), the name *Cenchrus s. str.* could be restricted to a core group of species (clades A5 + A6; Fig. 2). Monophyly of *Cenchrus s. str.* is neither confirmed nor rejected by our results, but optimization of non-molecular characters such as the geographic origin (America), basic number of
chromosomes (x = 17, except in *C. myosuroides* with x = 9; Brown, 1950; Morrone & et al. 2006),
the degree of fusion of bristles (up to the middle of the bristles, except in *C. myosuroides*),
the stiffness of internal bristles (stiff bristles) and the presence of retrorsely barbed bristles (except in
*C. pilosus*) all could be used to support the delimitation of *Cenchrus* in a strict sense …” (p. 400).

Link (1827) was the first to treat *Cenchrus ciliaris* in *Pennisetum* and followed by Chase (1921), Hitchcock (1931, 1935), Hitchcock and Chase (1951), Pohl (1980), and Wipff (2001, 2003). Based on chromosomal and morphological characteristics, Wipff (2001) transferred the entire *C. ciliaris* complex to *Pennisetum*. The chromosomal and genomic characteristics combined with phylogenic relationship favor the inclusion of *C. ciliaris* within the genus *Pennisetum* (Martel & al. 2004; Robert & al. 2010).

The unique and distinct fascicle morphology, and basic chromosome number [x=(9),10] place *Cenchrus myosuroides* and related taxa outside of the generic limits of *Cenchrus* sensu stricto and warrant their recognition within *Cenchropsis* Nash.


   Coarse perennials in large clumps. Culms (50) 70–200 cm long, more or less woody. Inflorescences 8–25 cm long, 6–15 mm wide, 60–150 fascicles densely arranged on the central axis. Primary panicle branches accrescent to a central axis; with sessile scars on axis. Panicle axis angular; puberulous; bearing deciduous fascicles. Fascicles and spikelets disarticulate as a unit. Bristles of the fascicle are all terete, free, connate only on an obconical base, not fused forming a cupule. The bristles of the fascicle are stiff, flexible, not rigid or spine-like, retrorsely scabrous. The terete bristles are 3–8 mm long, 0.2–0.6 mm wide, in 2–4 rows around the spikelet(s), shorter to longer than the spikelet(s), increasing in size towards the center, the inner bristles glabrous or short pubescent on the lower 1/2–2/3. The axis of the fascicles terminates in a spikelet (no primary bristle subtending the terminal spikelet). Spikelets per fascicle 1 (–3). Chromosome numbers 2n=54 (Brown 1950), ~68 (Bowden & Senn 1962), =70 (Avdulov 1931; Parodi 1946, Delisle 1964, Gould 1965, Reeder 1968), ~72 (Morrone & et al. 2006); most records, 2n=70. Basic chromosome number, x=(9),10


Described by Lamson-Scribner (1899) from a Waller Co., Texas collection, *Panicum ovinum* was recognized by Hitchcock and Chase (1910, 1915, 1951) and Silveus (1933, 1942). *Panicum ovinum* was treated as a synonym of *Dichanthelium aciculare* in the broad interpretation of *Dichanthelium* sect. *Augustifolia* by Gould and Clark (1978). In recent years, taxa in this section have again been recognized at the species rank (Weakley & al. 2011, 2017; LeBlond 2016), closely reflecting the taxonomy of Hitchcock and Chase (1910, 1915, 1951) and Silveus (1933, 1942). In contrast, LeBlond (in Weakley & al. 2011) reinstated *D. neuranthum* at specific rank and treated *P. ovinum* as a synonym of *D. neuranthum*. We, however, agree with Hitchcock and Chase (1910, 1915, 1951) and Silveus (1933, 1942) in treating *P. ovinum* as distinct from *P. neuranthum*. Our assessment is supported by our examination of the type specimens of *P. neuranthum* and *P. ovinum*, which revealed that the two taxa are distinct and readily separated from one another, as in the following couplet.

a. Vernal panicles open, branches flexuous spreading 45–90° from panicle axis; panicle 3–6 cm wide; the spikelets not subsecund, pedicels short to long; spikelets 2.1–2.2 mm long

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* Dichanthelium ovinum

a. Vernal panicles with branches strongly erect-ascending to appressed; panicles less than 2 cm wide; the spikelets subsecund (appearing 1-sided), pedicels short; spikelets 1.8–2 mm long

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* Dichanthelium neuranthum

Freckmann (1967) reported that *Dichanthelium ovinum* occurs inland in dry to moist open areas, prairies, and swales from southern Arkansas and Louisiana west to eastern Texas and south along the Gulf coast into Mexico to about Veracruz. A few specimens with the diagnostic features of this species have been collected in Florida. Whereas *D. neuranthum* is found chiefly in southern Florida and the West Indies, and specimens from Louisiana, Arkansas, and Texas are rare. It is found in open pinelands on very dry, sandy ground and on wet ground in glades of the Everglades.

Weakley & al. (2011) reported *Dichanthelium neuranthum* as occurring in savannas and open areas from North Carolina to Florida (south to the Bahamas, Cuba and Belize), west to east Texas and Arkansas. Along the Atlantic and Gulf coasts it is found primarily in maritime wet grasslands and wet pinelands savannas near the coast, especially those with a calcareous influences. Thomas (2017) reported *D. neuranthum* from prairies in southwestern Missouri in Newton County.


Peterson & al. (2015), based and molecular data and morphological characters, proposed that the five taxa treated in the *Chloris ciliata* complex (Anderson 1974) should be placed in *Stapfochloa*, viz., *S. berroi* (Arechav.) P.M. Peterson, *S. canterae* (Arechav.) P.M. Peterson, *S. ciliata* (Sw.) P.M. Peterson, *S. elata* (Desv.) P.M. Peterson, and *S. parvispicula* (Caro & E.A. Sánchez) P.M. Peterson.

Molina and Rúgolo De Agrasar (2004), in their taxonomic revision of the genus *Chloris* in South America, recognized two additional species in the *C. ciliata* complex that had either been previously synonymized under *C. canterae* Arechav. or recognized at infraspecific rank: *C. parodiana* Roseng. & Izag. and *C. grandiflora* Roseng. & Izag. As in the case of Peterson & al. (2015), we assign the two South American *Chloris* to *Stapfochloa* and make two new combinations.


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**LITERATURE CITED**


Wipff & Shaw: New combinations in grasses

Silveus, W.A. 1933. Texas Grasses; Classification and Description of Grasses; Descriptive Systematic Agrostology. Published by the author, San Antonio, Texas.
Silveus, W.A. 1942. Grasses; classification and description of species of *Paspalum* and *Panicum* in the United States. Published by the author, San Antonio, Texas.