

A NEW SUBSPECIES OF *DIGITARIA SANGUINALIS* FROM PAKISTAN

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Abstract

A new subspecies with two varieties of *Digitaria sanguinalis* as *D. sanguinalis* ssp. *pakistanica* var. *pakistanica* and var. *stewartii* is identified. *D. sanguinalis* has spines on the whole nerves of the lower lemma while the new subspecies is found to have spines on the upper half margins of nerves of the lower lemma only. It is also a distinguishing character. The lower lemma of the spikelet of variety *pakistanica* is glabrous while that of variety *stewartii* is hairy.

Introduction

Haller was the first author who gave a full and correct description of the genus *Digitaria* of the family Poaceae in the year 1768 and Stapf used this name, crediting it to Haller, although Haller (1768) and all other writers, took up the name from Heister (1748) (Henrard, 1950).

The lower lemma of *Digitaria* is highly diagnostic and can be used to identify most if not all the species. For many species, the length of the lower lemma is analogous to spikelet length. Relative length of the lower lemma and upper lemma is of taxonomic importance, but precise measurement must be made (Webster, 1983).

D. sanguinalis is the taxon of section *sanguinalis*, sub-genus *Eu-Digitaria* (Henrard, 1950). It can be easily distinguished from the other taxa of the genus *Digitaria* by the presence of spines on nerves of the lower lemma.

Materials and Methods

Preserved specimens of *Digitaria sanguinalis* from the National Herbarium, National Agricultural Research Centre (NARC) Islamabad, Quaid-I-Azam University Herbarium Islamabad (ISL) and Pakistan Museum of Natural History (PMNH) Islamabad were studied. Fresh specimens were also collected and mounted on herbarium sheets for study.

The morphological characters of all the available specimens of *Digitaria sanguinalis* were studied under the dissecting microscope (10x/21 D). Each measurement of a specimen was taken 3-5 times to ensure the reading and calculated its mean. Total morphological characters of a specimen observed were 63 following Henrard (1950) and Webster (1983).

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Results

Digitaria sanguinalis

(Linn.) Scop., Fl. Carn. 2 (1): 52. 1772; Ahmad & Stewart, Grasses W. Pak. 1: 17. 1958; Bor, Grasses Burma, Ceyl. Ind. Pak. 304. 1960; Bor in Towns *et al.*, Fl. Iraq 9: 478. 1968; S. A. Chaudhary, Fl. Lyallpur & Adjac. Can. Col. Distt. 12. 1969; Bor in Rech. f., Fl. Iran. 70: 491. 1970; Agnes Chase Rev. A. S. Hitchcock, Man. Grasses U. S. 2: 575. 1971; Tomus, Iconogr. Cormophy. Sinicorum 171. 1976; Tzevelev, Poaceae URSS. 672. 1976; Clayton in Tutin *et al.*, Fl. Eur. 5: 262. 1980; Cope in Nasir & Ali, Fl. W. Pak. 143. 231. 1982; Naomi Feinbrun-Dothan, Fl. Palaestina 308. 1986; Sherif & Siddiqi in El-Gadi, Fl. Libya 145: 286. 1988; S. A. Chaudhary, Grasses Saudi Arabia 374. 1989; Dickore, Rev. Fl. Karakorumensis 39: 120. 1995.

Panicum sanguinale Linn., Sp. Pl. 1: 57. 1753; Duthie, Fod. Grasses 12. 1888; *Paspalum sanguinale* (Linn.) Lam., Encycl. 1: 176. 1791; Hook. f., Fl. Brit. Ind. 7: 13. 1896; *Digitaria sanguinalis* (Linn.) Scop., ssp. *vulgaris* (Schr.) Henr. var. *rotteriana* Henr., Monogr. Genus *Digitaria* 986. 1950; Bor, Grasses Ind., Burma 7 Ceyl. 304. 1960; *D. sanguinalis* (Linn.) Scop. ssp. *pectiniformis* Henr., 1. c. 984; Bor in Rich. f., Fl. Iran. 491. 1970; *D. cruciata* auct. Non Nees ex Steud. 1854.

Annuals, culms 19.5-84.5 cm long, 1-10 in number, decumbent at the base, geniculate ascending, glabrous and scabrid, nodes 3-10. *Leaf sheath* 2-9 cm long, glabrous, scabrid or scarcely or densely hairy, green, grey-green, brown-green. *Leaf blade* 3-15 cm long, 0.2-0.7 cm broad, glabrous and scabrid or densely hairy, green, grey-green, brown-green. Inflorescence racemes 4-14 sub-digitate, 4.5-13.5 cm long, rachis triquetrous, margins dentate, glabrous. Spikelets binate, 0.25-0.35 cm long, 0.05-0.1 cm broad, broadly ovate, pedicels triquetrous, margins dentate, 1st pedicel 0.5-0.1 cm long, 2nd 0.2 cm long. *Lower glume* minute, triangular. *Upper glume* 0.15-0.2 cm long, 0.05 cm broad, $\frac{1}{2}$ or less than the $\frac{1}{2}$ as long as the spikelet. Margins also hairy, hairs verrucose, 3-nerved, narrow or broad, slightly triangular. *Lower lemma* 0.25-0.35 cm long, 0.05-0.1 cm broad, glabrous or hairy, 7-nerved, margins glabrous or hairy, spines on the whole lateral nerves or only on the upper half of the nerves, yellow or yellowish, green slightly enrolled, sometime stiff, yellowish spreading bristles may also be present. *Upper lemma* 0.25-0.35 cm long, 0.05-0.1 cm broad, as long as the spikelets, margins enrolled, yellowish or yellowish-green. *Upper palea* 0.2-0.35 cm long, 0.05-0.1 cm broad, margins enrolled yellow. Anthers 0.1 cm long. *Fruit* 0.2 cm long, 0.05 cm broad.

Type: Cultivated at Leiden, Van Royen (L.).

General Distribution: Pakistan (Baluchistan, Punjab, NWFP, Gilgit and Kashmir); Warm temperate regions throughout the world penetrating into the tropics.

ssp. *pakistanica* Syed Shahinshah Gilani, Mir Ajab Khan and Zabta Khan Shinwari
Margine lemmatis inferioris in dimidio superiore spinifero

Spines on the upper half margins of the nerves of lower lemma, which is characteristic feature, lemma glabrous or hairy.

Holotype: Rawalpindi Distt: Rawalpindi, 1700', 10 October 1959, R. R. Stewart 28619 (RAW!).

The new subspecies is divided into two varieties i.e., type variety and var. *stewartii*.

a. *Digitaria sanguinalis* subsp. *Pakistanica* var. *pakistanica*

Specimens examined: Punjab Rawalpindi Distt: Rawalpindi, 1700', 10 October 1959, R. R. Stewart 28619 (RAW); NWFP Hazara Distt.: Kaghan, 8000', 24 July 1996, Inayat 26339a (RAW).

Distribution: Pakistan - Rawalpindi, Kaghan.

b. var. *stewartii* Syed Shahinshah Gilani, Mir Ajab Khan and Zabta Khan Shinwari
lemmatis pilosa lemma hairy.

Holotype: Keran, 5-6000', 18 July 1939, R. R. Stewart & I. D. Stewart 17529 (RAW!).

Species examined: Azad Kashmir Keran, 5-6000', 18 July 1939, R. R. Stewart & I. D. Stewart 17529 (RAW); Muzaffarabad Distt: Jhelum valley Road, 2500', September 1928, R. R. Stewart 1010b (RAW). Punjab: Rawalpindi District: Rawalpindi, Topi Park, 1700', September 1938, R. R. Stewart 17087 (RAW); Islamabad, Quaid-i-Azam University Campus, 1st September 1977, Nisar & Ayaz 37b (ISL). NWFP Hazara Distt.: Abbotabad, 4500', 25 August 1956, R.R. Stewart 27812 (RAW); Shardi, 7 September 1976, Shaukat & Nisar 1352 (ISL); Thandiani, 8500', 13 August 1989, G. W. Trotter 106 (RAW). Baluchistan Kuchlak, 6 September 1980, Farrukh & Dasti 154 (RAW).

Distribution: Keran and Muzaffarabad, Kashmir; Rawalpindi, Islamabad, Abbotabad, Thandiani; Kuchlak, Baluchistan.

Discussion

The previous taxonomic treatment of *Digitaria sanguinalis* included different subspecies and varieties by different taxonomists at different times. *D. sanguinalis* has spines on the whole nerves of the lower lemma while the new subspecies is found to have spines on the upper half margins of nerves of the lower lemma only. Henrard (1950) has mentioned this character but didn't give any attention to it. No attention was made towards this character by any of the taxonomists in any of the floras. The distribution pattern of these subspecies and varieties is shown in Table 1 to know their geographic variation.

Thus the rank of subspecies to this new taxon is given and considered as the subspecies of *D. sanguinalis* along with 2 varieties. The lower lemma of type variety is glabrous while the lower lemma of variety *stewartii* is hairy.

Table 1. Distribution pattern of *Digitaria sanguinalis* ssp. *pakistanica* in Pakistan.

No.	<i>D. sanguinalis</i> ssp. <i>Pakistanica</i>	Distribution
1	var. <i>pakistanica</i>	Kaghan and Rawalpindi.
2	var. <i>stewartii</i>	Keran and Muzaffarabad, Kashmir; Rawalpindi, Islamabad, Abbotabad, Thandiani; Kuchlak, Baluchistan.

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