

A newly naturalized species in Korea, *Pennisetum flaccidum* Griseb. (Poaceae)

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Pennisetum flaccidum Griseb. (Poaceae) is native to Central Asia. While monitoring Poaceae weeds nationwide in Korea, we found its new naturalized distribution in Gunsan, Jeonrabuk-do. The species is distinguished from *P. alopecuroides* var. *alopecuroides* by subsessile involucre and plumose bristles. We provide the first documented record of *P. flaccidum* Griseb. for Korea with the description and illustration. We also provide a taxonomic key to the species of *Pennisetum* in Korea.

Keywords: naturalized species, *Pennisetum flaccidum*, Poaceae

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INTRODUCTION

The genus *Pennisetum* Richard is composed of approximately 80 species and grows mainly in the woodland, savanna, and weedy places of tropics. It is recognized by the presence of unbranched bristles which are derived from sterile panicle branches (Clayton and Renvoize, 1999). The bristles are not deciduous with the spikelets, instead remaining on the rachis at maturity (Chen and Phillips, 2006). There have been five taxa, *P. alopecuroides* (L.) Spreng. var. *alopecuroides*, var. *albiflorum* Y.N. Lee, var. *erythrochaetum* Ohwi, var. *viridescens* (Miq.) Ohwi, and *P. latifolium* Spreng., recorded in Korea (Chung, 1970; Korea National Arboretum and The Plant Taxonomic Society of Korea, 2007). The above four varieties of *P. alopecuroides* were distinguished by only the difference of bristle colors (Korea National Arboretum and The Plant Taxonomic Society of Korea, 2007; Lee, 2007; Korea National Arboretum, 2011). The two varieties, var. *albiflorum* Y.N. Lee and var. *erythrochaetum* Ohwi, however, were treated as the synonyms of *P. alopecuroides* var. *alopecuroides* (The Plant List, 2010). Ohwi (1984) described an accepted name of *P. alopecuroides* var. *viridescens*, first described by Miquel (1866 in Ohba *et al.*, 2005), by the characteristic of its pale green bristles. However, we are doubt identifying this variety from var. *alopecuroides* by the characteristic of pale green bristles.

Pennisetum alopecuroides var. *alopecuroides* has

nationwide distribution while *P. latifolium* has not been reported except Chung (1970) and Korea National Arboretum and The Plant Taxonomic Society of Korea (2007). *Pennisetum latifolium* has not been found by others since Chung recorded the species on 'Illustrated encyclopedia of fauna and flora of Korea' (1970). We also could not find this species from Chung's collection at SKK herbarium. We consider that this species may not be inhabited in Korea. *Pennisetum latifolium* is native to South America and cultivated in Japan and the United States as ornamental purposes (Osada, 1989; Allen and Hall, 2007).

Recently *P. flaccidum* Griseb. was found and collected from Gunsan, Jeonrabuk-do. Here, we provide the first documented record of *P. flaccidum* Griseb. for Korea with the description and illustration. We also provide a taxonomic key to the species of *Pennisetum* in Korea.

MATERIALS AND METHODS

The species was collected at Gunsan of Jeonrabuk-do in August 2012. The original description of the species was reviewed (Grisebach, 1868). The habit and flowers are photographed (Fig. 1) and drawn (Fig. 2).

Nomenclature of *Pennisetum* followed Clayton *et al.* (2012). All the voucher specimens were deposited at the Herbarium Culture Collection at National Academy of Agricultural Science, Suwon, Korea (HCCN).

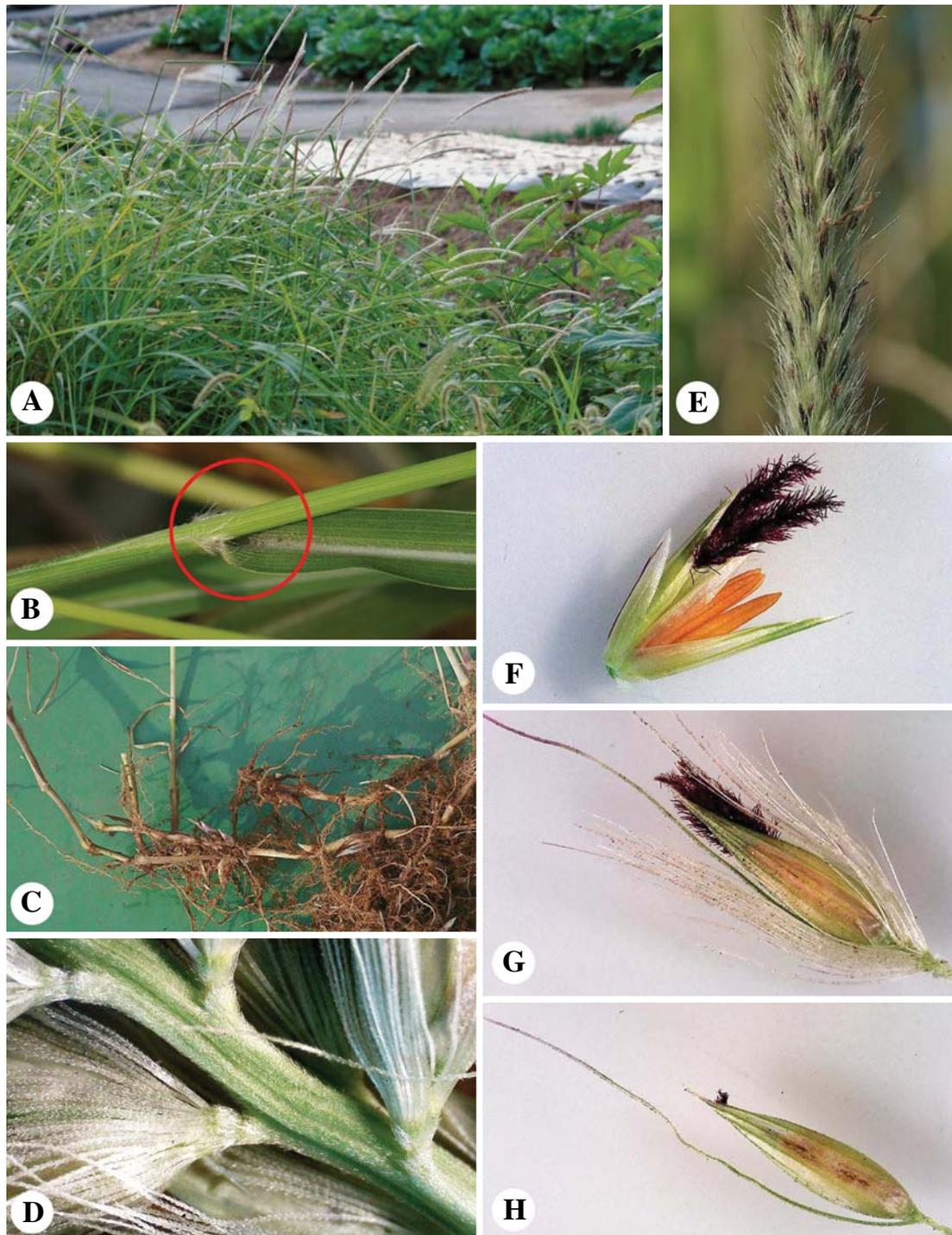


Fig. 1. Photograph of *Pennisetum flaccidum*. A. Habit. B. Collar region. C. Rhizome. D, E. Inflorescence. F-H. Spikelets. Photograph taken on August 30, 2012 at Gunsan, Jeonranbuk-do, Korea.

DESCRIPTION AND DISCUSSION

Pennisetum flaccidum Griseb., *Nachr. Königl. Ges. Wiss. Georg-Augusts-Univ.* **3: 86, 1868.**
Gymnotrix flaccida (Griseb.) Munro ex Aitch., *Cat. Pl.*

Punjab Sindh: 163, 1869.
Cenchrus flaccidus (Griseb.) Morrone, *Ann. Bot. (Oxford)* **106: 128, 2010.**
Pennisetum mongolicum Franch. ex Roshev. in B.A. Fedchenko, *Fl. Asiat. Ross.* **6: 77, 1914, pro syn.**

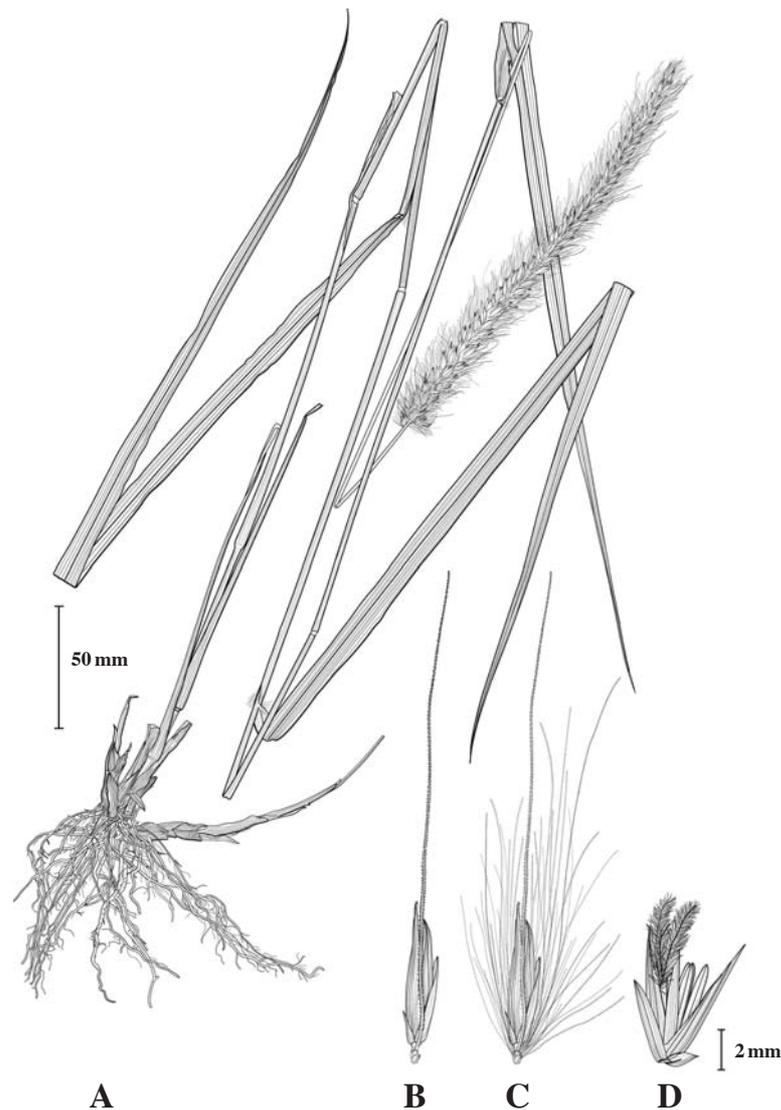


Fig. 2. *Pennisetum flaccidum* Griseb. A. Habit. B-D. Spikelets and bristles.

Pennisetum centrasiaticum var. *qinghaiense* Y.H. Wu, Acta Bot. Boreal.-Occid. Sin. 24: 1117, 2004.

Perennial; rhizomatous. Culms tufted and erect; up to 120 cm tall. Leaf sheaths loose, glabrous, margins ciliate, imbricate at base; leaf blades linear with a distinct white midrib, 34-45 cm long, 4-14 mm wide, glabrous, acuminate; ligule 1-2 mm. Inflorescences panicles, terminal, linear, straight or slightly flexuous, loose to moderately dense, 4-22 cm long, 12-28 mm wide; rachises glabrous, scaberulous, bearing deciduous spikelet clusters; bristles numerous, usually pale green, occasionally purple-tinged, soft, slender, primary bristles 12-22 mm long, distinguishably longer than other bristles. Spikelet narrowly ovate-oblong, 4-7 mm; pedicels sessile to subsessile; lower glume usually 1/4 spikelet length or less; upper

glume 1/3-2/3 spikelet length, 1-3-veined, acuminate; lower floret staminate, lemma as long as spikelet, 3-5-veined, acuminate-rostrate, palea fully developed; upper lemma acuminate, 5-veined. Anthers 3. Fl. and fr. Jul-Oct.

Common name: Himalayan Fountain Grass, Flaccigrass
Korean name: Ga-Neun-Soo-Keu-Ryung (가는수크령).

Habitats. Hillsides, field margins, roadsides on dry sandy soils, sometimes also on slightly saline alluvial soils on flood plains.

Distribution. Central Asia, Western Asia, China, India, Himalayas westward to Afghanistan.

Specimens examined. Yeobangri, Gunsan-si, Jeonrabuk-do, N 36° 00' 20.63", E 126° 47' 35.88", 30 Aug 2012. C.S. Kim and Y.W. Han (3 sheets, HCCN). Ladak,

Tibet, India, 1868. T. Thomson (Isotype, image data, Royal Botanic Garden, Edinburgh, UK).

Pennisetum flaccidum is native to Central Asia (Allen and Hall, 2007). This is a widespread and rather variable species having tough and spreading rhizomes, a glabrous inflorescence axis, and involucre of soft bristles (Chen and Phillips, 2006). Although the species produce a few viable seeds, its intensive vegetative reproduction system makes the species potentially invasive in many non-native countries (Szczesniak, 2011). However, this species is cultivated primarily as an ornamental purpose and good for a forage in some countries because of characteristics of frost and drought resistance (Chen and Phillips, 2006; Allen and Hall, 2007).

In Korea, it was first found at the roadside of a provincial road near Gunsan IC, Gunsan, Jeonrabuk-do. Many individuals of the species were distributed for about 100 m along a roadside. It could be rapidly spread out to adjacent areas because of its intensive vegetative reproductive system. The occurrence of this species in Korea is probably the result of an accidental introduction.

The species is distinguished from *P. alopecuroides* var. *alopecuroides* by sessile involucre and plumose bristles. Korean name, 'Ga-Neun-Soo-Keu-Ryung' was given based on thinner inflorescences than those of *P. alopecuroides* var. *alopecuroides* (Soo-Keu-Ryung).

A Key to *Pennisetum* in Korea

1. Involucres with a basal 2 mm stipe; primary bristles distinctly longer than all the other bristles; bristles glabrous *P. flaccidum*
1. Involucres sessile; primary bristles not distinctly longer than all the other bristles; bristles plumose *P. alopecuroides* var. *alopecuroides*

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