

Confirmation of a naturalized grass (Poaceae) in Taiwan,
Pennisetum setaceum (Forssk.) Chiov.

歸化的台灣禾草—羽絨狼尾草的確認

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Abstract

Pennisetum setaceum was reported as a cultivated species from Taiwan in the past and is usually misidentified as *P. polystachion*. Recently, we examined specimens in some herbaria of Taiwan and confirmed the differences and diagnostic characters of the two species. This article provides the key to species of the genus *Pennisetum* from Taiwan, and a description of this naturalized grass with line drawing for identification.

摘要

羽絨狼尾草在過去被報導為栽培植物，且容易被誤認為牧地狼尾草，近期透過重新檢視散置於台灣各主要標本館之狼尾草屬標本，確認兩物種間之差異及識別特徵。本文增補此種為歸化台灣之禾本科植物，並提供其物種描述、手繪圖，以及台灣狼尾草屬之檢索表供鑑定。

Key words: *Pennisetum setaceum*, Poaceae, Taiwan

關鍵詞：羽絨狼尾草、禾本科、台灣

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Introduction

The genus *Pennisetum* Rich. (Poaceae: Paniceae) comprises 80 species throughout the tropics and subtropics (Chen and Philips 2006). The most diagnostic characteristic for this genus is the highly reduced panicle inflorescence that looks more like a spike. Each branch reduces to a highly contracted cluster composed of one to several spikelets, and the lower parts of the branch reduce to bristles which form an involucre and surround upper spikelets. Another genus with similar spikelike inflorescence is *Setaria*. Nevertheless, the bristles of the genus *Pennisetum* is deciduous with spikelets and can be easily distinguished from *Setaria* whose bristles remain on rachis at maturity.

The genus *Cenchrus* is closely related to *Pennisetum*. Recently some researchers include the genus *Pennisetum* in the genus *Cenchrus* based on molecular phylogeny (Chemisquy *et al.* 2010). We hesitate to accept such an extreme deduction and still regard *Pennisetum* as a separate genus.

There were four species recorded in Taiwan before 2000 (Liu 2000), including *Pennisetum*

alopecuroides (L.) Spreng., *P. cladeustum* Hochst. ex Chiov., *P. polystachion* (L.) Schult., and *P. purpureum* Schumach. In addition, *P. setaceum* (Forsk.) Chiov. was first reported in Taiwan as a cultivated grass (Huang 1979) and was not formally described in any publication. It has been introduced into some countries as fodder or ornamental grass and usually becomes a disruptive invasive species (Benton 1998; Csurhes 2011). Similarly, it was introduced into Taiwan as fodder and then it escaped and became naturalized. In herbaria of Taiwan, the specimens of *P. setaceum* were usually misidentified as *P. polystachion* because both species have similar bristles characteristics which are densely silky-plumose at base. Nevertheless, we can easily distinguish them by the diagnostic character of panicle arrangements and upper florets in spikelets. In *P. polystachion*, flowering culms are much branched and forming a false panicle, instead of less branched, even solitary in *P. setaceum*. In addition, the upper lemmas are subcoriaceous, smooth and shiny in *P. polystachion* rather than chartaceous in *P. setaceum*.

This article provides the key to species of

the genus *Pennisetum* in Taiwan and a description of *P. setaceum* with line-drawing for identification.

Key to species of *Pennisetum*

- 1. Culms stoloniferous; inflorescence nearly enclosed in upper sheaths when flowering
..... *P. clandestinum*
- 1. Culms not stoloniferous; inflorescence exerted.
 - 2. Lemma dimorphic, inner bristles densely silky-plumose at base
 - 3. Flowering culms much branched; upper florets easily disarticulating at maturity; upper lemma subcoriaceous, surface smooth and shiny *P. polystachion*
 - 3. Flowering culms less branched or solitary; upper florets not disarticulating at maturity; upper lemma chartaceous, surface sparsely hispidulous
..... *P. setaceum*
 - 2. Lemma monomorphic; inner bristles not plumose.
 - 4. Spikelets with 2-3mm long pedicel; anthers without a tuft of hairs at one end *P. alopecuroides*
 - 4. Spikelets sessile; anthers with a tuft of hairs at one end *P. purpureum*

Taxonomic Treatment

Pennisetum setaceum (Forssk.) Chiov., Boll. Soc. Bot. Ital. 1923: 113. 1923; Clayton and Renvoize, Fl. Trop. East Afr. Gramineae:

675. 1982; Webster, Aus. Paniceae: 192. 1987; Chaudhary, Grasses Saud. Ara.: 385. 1989; Wipff in Barkworth *et. al.* (eds.), Fl. North America 25: 527. 2003.

羽絨狼尾草 Fig.1

Phalaris setacea Forssk., Fl. Aegypt.-Arab. 17. 1775.

Cenchrus setaceus (Forssk.) Morrone, Ann. Bot., 106: 129. 2010.

Perennials, tufted. Culms erect, of moderate texture, 50-130 cm tall, glabrous, culm nodes glabrous. Leaf sheaths surface glabrous to densely pilose. Ligule a ciliate membrane, 1-1.5 mm long. Blades cauline, linear, flat, 20-65 cm long, 3-5 mm wide, margins scaberulous, apex acuminate, surface densely, pilose on both sides. Inflorescence a panicle, terminal, cylindrical, 15-20 cm long, axis angular with sharp decurrent wings, base exerted from uppermost sheath, without conspicuous branches, branches contracted into spikelets clusters, spikelets subtended by an involucre of bristles. Involucres sessile, enclosing 1 spikelet, bristles slender and free to the base, margins densely silky-plumose in lower half, falling with spikelets when mature. Spikelets bisexual, dorsally compressed, narrowly lanceolate, 4.5-5 mm long, with 2 florets; lower floret reduced, usually sterile, sometimes staminate; upper floret fertile. Lower glume absent or reduced, minute. Upper glume broadly lanceolate, 3.5-4 mm long, membranous, 5-veined, not keeled, veins glabrous, surface glabrous, margins smooth, apex

acute, awnless. Lower lemma lanceolate, 4.5-5 mm long, chartaceous, 5-7-veined, midvein keeled, veins glabrous, surface hairy, sparsely hispidulous, margins smooth, apex acuminate, awnless. Lower palea well developed, membranous, lanceolate, 2-keeled, keel scaberulous. Upper floret pale gray. Upper lemma lanceolate, 3-4.5 mm long, chartaceous to subcoriaceous, but thinner, 5-7-veined, veins glabrous, surface hispidulous, margin smooth, apex mucronate. Upper palea oblong, subcoriaceous, but thinner, 2-veined, surface smooth. Anthers 3, 1.5 mm long.

Distribution: Native to northern and eastern Africa, south-western Asia. Introduction into Australia, North American, Hawaii and Mexico.

Habitat: Grassy places on mountain slopes, lawns, wastelands, roadsides.

Examined Taiwan specimen: MIAOLI: Tapu, *Hsu s.n. June 30, 1960* (TAI). NANTOU: Wandan, *Chen 6193* (TAIE). CHIAYI: Fanlu, *Kung & Chang 67* (TNM). KAOHSIUNG: Taoyuan, *Chen 7026* (TAIE). TAITUNG: Tawu, *Liu & Su s.n. June 28, 2003* (TAIF).

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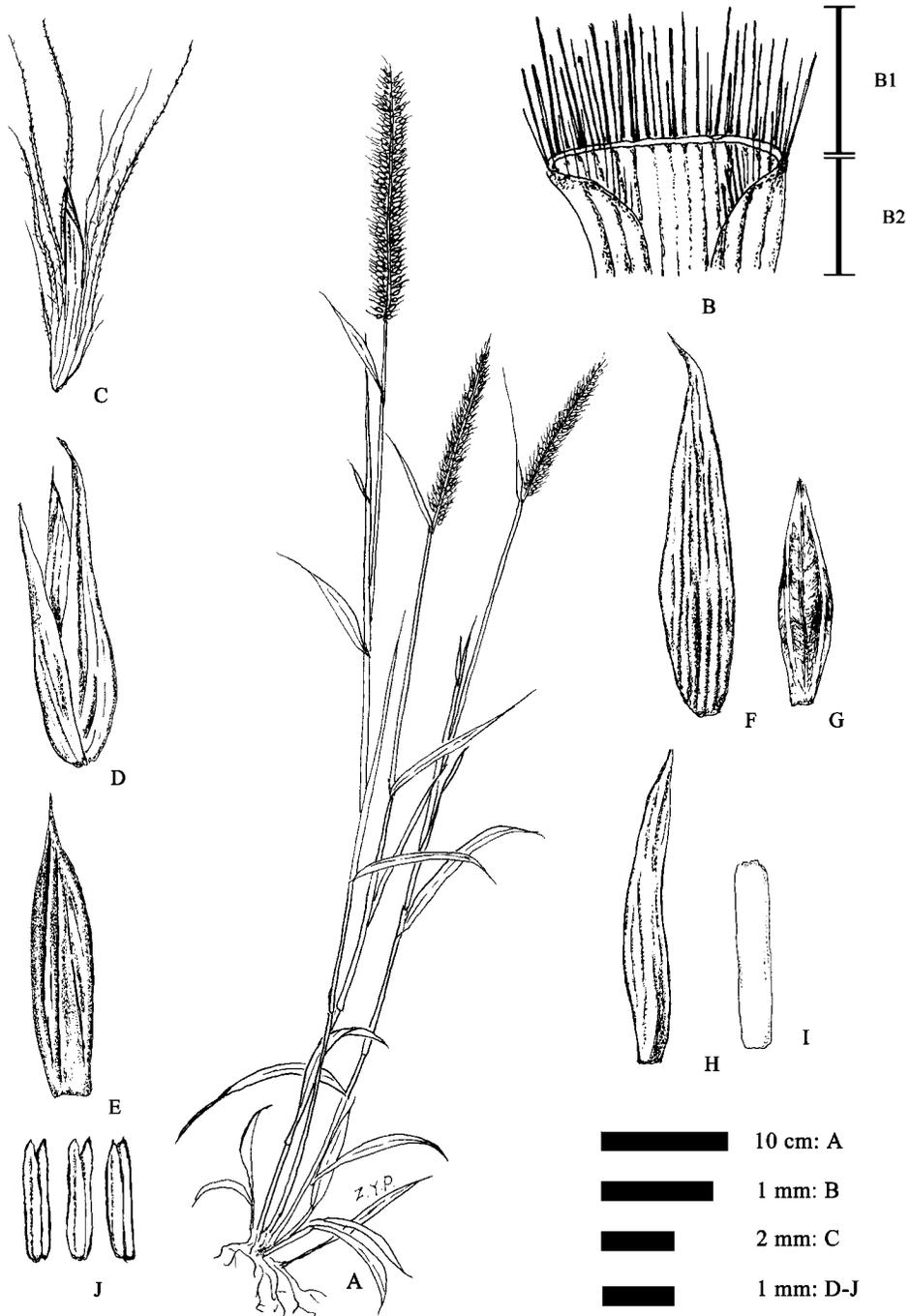


Fig. 1. *Pennisetum setaceum* (Forssk.) Chiov.

A. habit; B. joint between sheath and blade: B1. ligule, B2. Leaf sheath; C. spikelet with bristles; D. spikelet without bristles; E. upper glume; F. lower lemma; G. lower palea; H. upper lemma; I. upper palea; J. anthers.