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Notes on Grasses (Poaceae) for the *Flora of China*, VI. New Combinations in Stipeae and *Anthoxanthum*

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ABSTRACT. When *Oryzopsis* is confined to the type species, Chinese species are placed in *Achnatherum* and *Piptatherum*. This necessitates the following new combinations: *Piptatherum grandispiculum*, *Piptatherum aequiglume* var. *ligulatum*. *Piptatherum tibeticum* var. *psilolepis*. *Piptatherum munroi* var. *parviflorum*, *Achnatherum henryi*, and *Achnatherum henryi* var. *acutum*. *Achnatherum henryi* is lectotypified. The new name *Piptatherum kuoi* replaces the illegitimate name *Piptatherum obtusum*, and this species is lectotypified. *Hierochloe potaninii* is transferred to *Anthoxanthum* as *A. potaninii*, as *Hierochloe* is regarded as a synonym of *Anthoxanthum*. All the grass taxa (Poaceae) listed are endemic to China.

Key words: *Achnatherum*, *Anthoxanthum*, China, *Hierochloe*, *Oryzopsis*, *Piptatherum*, Poaceae.

When preparing the tribe Stipeae, Poaceae, for the *Flora of China*, it was necessary to consider generic concepts in the light of modern research, as discussed below. This has necessitated a few new combinations. The opportunity is also taken in this paper to publish a new combination in *Anthoxanthum* in the tribe Aveneae.

STIPEAE

Delimitation of genera in Stipeae is still in a state of flux, but recent work has led to a realignment of some familiar genera, based in part on molecular studies. Opinion has been divided in the Old World on whether to take a broad view of *Stipa* itself, including *Achnatherum* and some smaller genera, or whether to recognize *Achnatherum* separately. Freitag (1985) took a broad view, as did Cope (1982) and Noltie (2000). However, Russian and Chinese authors have generally kept the two genera separate, for example Tzvelev (1968, 1976) and Lu and Kuo (1987). Barkworth (1993) has published a

generic reassessment for North America and, with collaborators, followed this with a report on molecular studies (Jacobs et al., 2000). The two genera are now considered separate in America (Soreng, 2003) and will be also in the treatment of Poaceae for the *Flora of China*.

A further problem involves the genus *Oryzopsis* Michaux. This name has been widely used in both hemispheres, with *Piptatherum* regarded as a synonym, a view reinforced by Freitag's paper (1975) revising the species from southwest Asia. However, the type species of *Oryzopsis*, *O. asperifolia* Michaux (1803) from North America, has many unusual features and is not closely related to other species placed in *Oryzopsis* (Barkworth, 1993). *Oryzopsis* is therefore considered as monotypic in modern treatments (Jacobs et al., 2000; Soreng, 2003), with the other species placed in *Piptatherum* and *Achnatherum*.

Most Chinese species placed in *Oryzopsis* in the Chinese flora (Lu & Kuo, 1987) already have combinations in either *Piptatherum* or *Achnatherum*. However, a few new combinations are required, as set out below. All the taxa listed are endemic to China, or almost so (*Piptatherum kuoi* extends to the Ryukyu islands in Japan and Taiwan).

Piptatherum kuoi S. M. Phillips & Z. L. Wu, nom. nov. Replaced name: *Piptatherum obtusum* (Stapf) Roshevitz, in Bot. Mater. Gerb. Bot. Inst. Komarova Acad. Nauk SSSR 14: 102. 1951, non *Piptatherum obtusum* Nees & Meyen, 1841. *Oryzopsis obtusa* Stapf, in Hooker's Icon. Pl. 24(4): t. 2393. 1895. TYPE: China, Hubei: Ichang and immediate neighborhood, A. Henry 3507 (lectotype, designated here, K).

This species differs markedly from other *Piptatherum* species in China by its plump, ellipsoid,

glabrous floret and large callus with circular scar. It also has glabrous anthers. The other eight Chinese species (e.g., *P. munroi* (Stapf) Mez) have lanceolate, usually pubescent florets and a very shallow callus with a transversely elliptic scar. The anthers are normally bearded.

The species *Piptatherum aequiglume* (Duthie ex Hooker f.) Roshevitz, *P. tibeticum* Roshevitz, and *P. munroi* (Stapf) Mez belong to a group of closely related species in high parts of western China and the western Himalaya. The following taxa described within this group require transfer from *Oryzopsis*.

Piptatherum grandispiculum (P. C. Kuo & Z. L. Wu) S. M. Phillips & Z. L. Wu, comb. nov. Basionym: *Oryzopsis grandispicula* P. C. Kuo & Z. L. Wu, Acta Phytotax. Sin. 19: 435. t. 1. 1981. TYPE: China. Xizang: Xigazê, Daiduka, 3700 m, 25 Aug. 1963, *Zhi-ye Gin 10210* (holotype, HNWP).

This is a variant with large 8–9 mm spikelets, close to *P. munroi* (Stapf) Mez, but distinguished from that species and others of the group by its smooth leaves and panicle branches.

Piptatherum aequiglume (Duthie ex Hooker f.) Roshevitz var. ***ligulatum*** (P. C. Kuo & Z. L. Wu) S. M. Phillips & Z. L. Wu, comb. nov. Basionym: *Oryzopsis aequiglumis* Duthie ex Hooker f. var. *ligulata* P. C. Kuo & Z. L. Wu, Acta Phytotax. Sin. 19: 435. 1981. TYPE: China. Yunnan: Lijiang–Heqing, 2800 m, 10 Sep. 1962, *Exped. Zhongdian 2270* (holotype, KUN).

This taxon appears to be a local element from the *Piptatherum aequiglumis*–*P. munroi* species group. The 8–13 mm ligule is remarkably long, and the 0.4 mm lemma pubescence is longer than in either aforementioned species. It may prove to merit separate specific status when better known.

Piptatherum tibeticum Roshevitz var. ***psilolepis*** (P. C. Kuo & Z. L. Wu) S. M. Phillips & Z. L. Wu, comb. nov. Basionym: *Oryzopsis tibetica* (Roshevitz) P. C. Kuo var. *psilolepis* P. C. Kuo & Z. L. Wu, Acta Phytotax. Sin. 19: 435. 1981. *Oryzopsis psilolepis* (P. C. Kuo & Z. L. Wu) L. Liu, Vasc. Pl. Hengduan Mountains 2: 2257. 1994. TYPE: China. Sichuan: Anning, 2400 m, 4 July 1959, *Xin Li 78029* (holotype, PE).

This taxon differs from the typical variety by its smooth glabrous lemmas.

Piptatherum munroi (Stapf) Mez var. ***parviflorum*** (Z. L. Wu) S. M. Phillips & Z. L. Wu, comb. nov. Basionym: *Oryzopsis munroi* Stapf var. *parviflora* Z. L. Wu, Acta Phytotax. Sin. 30(2): 174. 1992. TYPE: China. Qinghai: Menyuan, Zhugu, Xuelongtan, 2700 m, 7 July 1962, *Geobotanical Group 1651* (holotype, HNWP).

This taxon differs only slightly from *P. tibeticum* Roshevitz, but that species is reported to have an ovate floret and 3 to 5 branches at the panicle nodes, whereas *P. munroi* var. *parviflorum* has a lanceolate floret and usually paired panicle branches.

Two species within *Oryzopsis* in the Chinese flora (Lu & Kuo, 1987) fit better into *Achnatherum* than *Piptatherum*, namely *O. chinensis* and *O. henryi*. These had previously been recognized as different from other Chinese species in *Oryzopsis* (Wu & Zhou, 1981), when a new section *Sinoryzopsis* was erected to accommodate them. They are best placed in *Achnatherum* on account of their more or less terete florets with a pubescent callus. The first has already been transferred as *Achnatherum chinense* (Hitchcock) Tzvelev. The second, with its variety, is transferred below.

Achnatherum henryi (Rendle) S. M. Phillips & Z. L. Wu, comb. nov. Basionym: *Stipa henryi* Rendle, J. Linn. Soc., Bot. 36: 382. 1904. *Oryzopsis henryi* (Rendle) Keng ex P. C. Kuo, Fl. Tsinlingensis 1: 145. 1976. TYPE: China. Sichuan: S. Wushan, *A. Henry 5530* (lectotype, designated here, K).

The specimen selected as lectotype from the three syntypes listed in the protologue already bears a lectotype label “selected by H. Freitag.” However, this lectotypification has never been published. The selected specimen is the best of the three original syntypes, the other two being poor specimens consisting of only one culm.

Achnatherum henryi var. ***acutum*** (L. Liu ex Z. L. Wu) S. M. Phillips & Z. L. Wu, comb. nov. Basionym: *Oryzopsis henryi* var. *acuta* L. Liu ex Z. L. Wu, Acta Phytotax. Sin. 19(4): 435. 1981. *Oryzopsis acuta* (L. Liu ex Z. L. Wu) L. Liu, Vasc. Pl. Hengduan Mountains 2: 2257. 1994. TYPE: China. Yunnan: Weixi, 2500 m, 8 Mar. 1940, *K. M. Feng 3729* (holotype, PE).

ANTHOXANTHUM

The genus *Hierochloë* R. Brown was included within *Anthoxanthum* by Schouten and Veldkamp

(1985) because of the morphological intermediates between them. This decision was followed by Noltie (2000) and has been borne out by work on the group for the *Flora of China*, where several intermediates also occur. By unifying these two genera, their close relationship is emphasized, as evidenced by their unusual 3-flowered spikelet structure, with the two lower florets sterile or staminate and modified, and all three falling together from the glumes as one unit. The possession of coumarin, found in this group, does not occur elsewhere in the grasses.

Schouten and Veldkamp made new combinations in *Anthoxanthum* for those species of *Hierochloë* where combinations did not already exist, but omitted one species from China.

Anthoxanthum potaninii (Tzvelev) S. M. Phillips & Z. L. Wu, comb. nov. Basionym: *Hierochloë potaninii* Tzvelev, Rast. Centr. Azii, Mater. Bot. Inst. Komarov 4: 35. 1968. TYPE: China. W Gansu: Li-Dsha-Pu, 20 June 1885. *G. Potanin* s.n. (holotype, LE not seen).

This was reduced to synonymy under *Hierochloë laxa* R. Brown ex Hooker f. (*Anthoxanthum laxum* (R. Brown ex Hooker f.) Veldkamp) by Y. H. Sun and P. C. Kuo (1987). However, the two taxa can be distinguished as follows:

KEY TO DISTINGUISH *ANTHOXANTHUM POTANINII* AND *A. LAXUM*

- 1a. Leaf blades scabrous; glumes unequal; bisexual floret scabrid near apex *A. potaninii*
- 1b. Leaf blades smooth; glumes subequal; bisexual floret pilose or hirsute toward apex *A. laxum*

Anthoxanthum laxum occurs on high mountain ledges and in alpine pasture over 3000 m in eastern Afghanistan, northern Pakistan, Kashmir, and Nepal (Cope, 1982), and *A. potaninii* is known only

from southern Gansu and western Sichuan provinces of China.

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