

***Neotrinia* gen. nov. and *Pennatherum* sect. nov. in *Achnatherum* (Poaceae: Stipeae)**

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Summary. *Stipa splendens* (syn. *Achnatherum splendens*) has been transferred to *Neotrinia* (Tzvelev) M. Nobis, P. Gudkova et A. Nowak gen. nov. as *N. splendens* (Trin.) M. Nobis, P. Gudkova et A. Nowak, based on a comparison of the macromorphology and lemma micromorphology of the Asian representatives of the tribe *Stipeae*. Lemma epidermal patterns in the examined species are presented and discussed. Additionally, a new section *Pennatherum* M. Nobis comprising *Achnatherum pelliotii*, a species recently transferred to *Achnatherum* from *Ptilagrostis* is also proposed. This taxon clearly differs from *Ptilagrostis* by the lemma micromorphology. The species with typical maize-like lemma micromorphological pattern is apparent member of *Achnatherum*, however, because of having plumose awns and short, blind calluses, it was earlier included into *Ptilagrostis*. *Achnatherum pelliotii* is the only Old World *Achnatherum* species, with long pilose awns, thus, we propose to place it in the new section.

***Neotrinia* gen. nov. и *Pennatherum* sect. nov. рода *Achnatherum* (Poaceae: Stipeae)**

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Ключевые слова: новая секция, новый род, таксономия, Poaceae, *Stipeae*.

Аннотация. В статье приводится новый род *Neotrinia* (Tzvelev) M. Nobis, P. Gudkova et A. Nowak gen. nov., принадлежащий трибе *Stipeae* (Poaceae), включающий *N. splendens* (Trin.) M. Nobis, P. Gudkova et A. Nowak, (syn. *Stipa splendens*, *Achnatherum splendens*). Описание основано на сравнении макро- и микроморфологического строения нижних цветковых чешуй азиатских представителей трибы *Stipeae*. Также представлено обсуждение паттернов микроморфологического строения нижних цветковых чешуй исследованных (азиатских) видов трибы *Stipeae*. Кроме того, описана новая секция *Pennatherum* M. Nobis рода *Achnatherum*, включающая *A. pelliotii*, вид, недавно переведенный в *Achnatherum* из близкородственного рода *Ptilagrostis*. *Achnatherum pelliotii* отличается от *Ptilagrostis* по микроморфологическому строению нижних цветковых чешуй и относит-

ся к типичному «maize-like» паттерну; этот вид является явным представителем рода *Achnatherum*, однако из-за наличия перистых остей и короткого тупого каллуса он был ранее отнесен к роду *Ptilagrostis*. В настоящее время *A. pelliottii* – единственный вид *Achnatherum* из Старого света с опушенными остями, поэтому данный вид был отнесен к новой секции.

The number of genera recognized within the tribe *Stipeae* Dumort. (Poaceae) and their treatment have varied considerably over the years (Roshvitz, 1916, 1934; Tzvelev, 1976; Wu, Phillips, 2006; Barkworth, 2007; Hamasha et al., 2012; Romaschenko et al., 2012; Nobis, 2013). This is particularly noticeable in the genus *Stipa* L., which some authors has interpreted as including almost all members of the tribe with elongated florets (e.g., Steudel, 1854; Hitchcock, 1951; Bor, 1970; Freitag, 1985), but which most of researchers currently studying the tribe treat as an Old World genus with around 150 species (Hamasha et al., 2012; Nobis, 2013, 2014). Similarly is in the case of *Achnatherum* P.Beauv., which is treated as separate genus, comprising species occurring in the Old and the New World (Tzvelev, 1976; Romaschenko et al., 2012). Recently, based on molecular evidence, some species have been separated from *Achnatherum* and transferred to such genera like *Stipellula* M. Röser et H. R. Hamasha, *Aristella* (Trin.) Bertol. and *Patis* Ohwi (Hamasha et al., 2012; Romaschenko et al., 2014). However, the placement of some species within these above mentioned genera requires further studies (Nobis et al., unpubl).

Achnatherum is a genus comprising approximately 56 widely distributed taxa, of which 35 occur in Eurasia and Africa, 25 in Americas and one in New Zealand (Tzvelev, 1976; Romaschenko et al., 2012). *Achnatherum* is regarded as polyphyletic genus, split into few clades (Hamasha et al., 2012; Romaschenko et al., 2012), that slightly differ in both morphology and molecular traits. Nevertheless, all species representing the genus are clearly distinguishable by the lemma micromorphological patterns, which are considered as conservative and important phylogenetic character (Tzvelev, 1977; Barkworth et al., 1987; Romaschenko et al., 2012; Nobis, Nobis, 2013; Nobis et al., 2014, 2015). Members of the genus *Achnatherum* have typical maize-like pattern of the lemma micromorphology (Romaschenko et al., 2012), with very frequent silica bodies and short fundamental cells (Fig. 1). Based on molecular studies, *Achnatherum pelliottii* (Danguy) M. Röser et H. R. Hamasha has been transferred from the genus *Ptilagrostis* (Hamasha et al., 2012). This taxon clearly differs from all the

members of the genus *Ptilagrostis* by the lemma micromorphology. The species with typical maize-like lemma micromorphological pattern is apparent member of *Achnatherum* (Fig. 1), however, because of the presence of plumose awns and short, blind calluses, it was earlier included in *Ptilagrostis*. Currently, *Achnatherum pelliottii* is the only Old World *Achnatherum* species, with long pilose awns, thus, we propose to place it in the new section *Pennatherum* (see below).

A similar problem applies to *Achnatherum splendens* (Trin.) Nevski [= *Stipa splendens* Trin.]. This species also distinctly differs from *Achnatherum* and *Stipa* species both by molecular traits (Hamasha et al., 2012; Romaschenko et al., 2012) and the lemma micromorphology (Fig. 1). In phylogenetic studies on the tribe *Stipeae* (Hamasha et al., 2012; Romaschenko et al., 2012, 2014), the species is located outside of Eurasian and American clades comprising *Achnatherum*, *Stipa*, *Ptilagrostis* and *Trickeraia*. *Stipa splendens* was described from Transbaikalian region in the Central Asia, however, based on its morphology it was transferred by Knuth (1829) to *Lasiagrostis* Link, and later by Nevskiy (1937) to *Achnatherum*. The placement of this species in *Achnatherum* was later confirmed and established by Pazij (1968), Tzvelev (1972, 1976), Lomonosova (1990), Wu and Phillips (2006), however, rejected and treated in traditional concept as *Stipa splendens* by Bor (1960, 1970), Cope (1982) and Freitag (1985). *Achnatherum splendens* has a broad distribution. It occurs in southern Russia, Mongolia, China, Japan, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Turkmenistan, Afghanistan, Iran, Pakistan, India (Bor, 1968, 1970; Pazij, 1968; Tzvelev, 1976; Freitag, 1985; Wu, Phillips, 2006). It is very well distinguishable species, forming dense (large and wide) tufts with high and hard stems, with long, hard and rigid leaves, long and dense panicles with numerous flowers. On the basis of these characters, the discussed species does not resemble any of the remaining species of *Achnatherum*. Moreover, the lemma epidermal pattern of *A. splendens* is somewhat similar to those having by the members of *Ptilagrostis*, *Trickeraia*, *Orthoraphium* and *Psammochloa*, rather than *Achnatherum* and *Stipa* (Fig. 1; Romaschenko et al., 2012; Nobis, 2013, 2014;

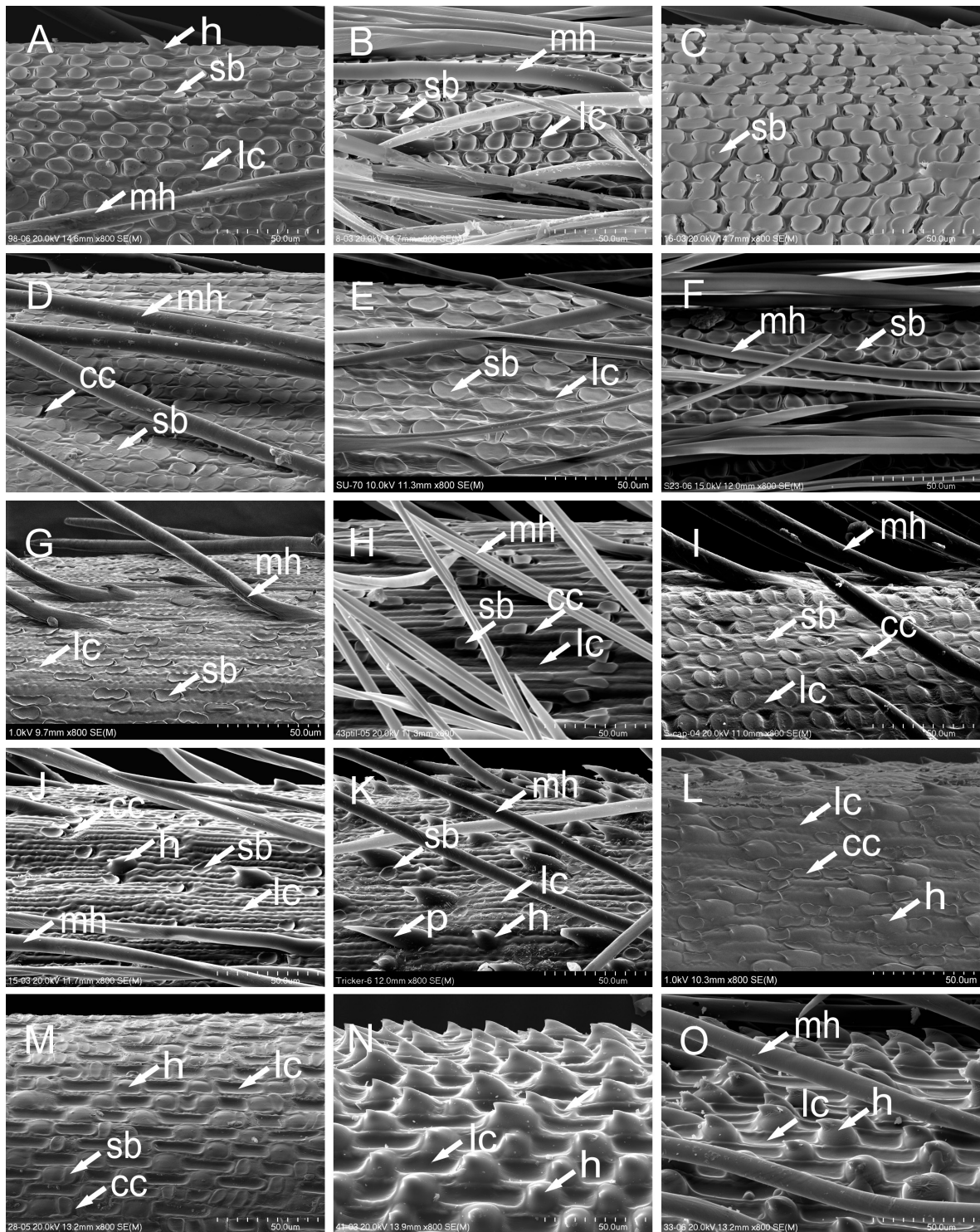


Fig. 1. SEM morphology of lemma epidermal patterns of: A – *Achnatherum calamagrostis* (L.) Beauv., France, 24 Jul 1964, S. and B. Pawłowsky (KRA122557); B – *A. pelliotii* (Danguy) M. Röser et H.R. Hamasha, China, 31 May 1957, A.A. Yuantov et al. (LE); C – *A. turkomanicum* (Roshev.) Tzvelev, Kyrgyzstan, 2 Jul 2015, M. Nobis, A. Nowak (KRA); D – *A. brandisii* (Mez) Z. L. Wu, India, 8 Aug 1939, R. R. Stewart 18120 (NY); E – *A. inebrians* (Hance) Keng, China, 08 Jul 1873, N. M. Przewalski (LE); F – *A. caragana* (Trin.) Nevski, Tajikistan, 10 Jun 2012, M. Nobis, A. Nowak (KRA); G – *Ptilagrostis alpina* (Fr. Schmidt) Sipl., Russia, 10 Aug 1978, S. Kharkevich, T. Bush (NY); H – *P. malyshevii* Tzvelev, Kyrgyzstan, 8 Aug 1956, L. I. Popova, A. Noldoyarov (FRU); I – *Stipellula capensis* (Thunb.) M. Röser et H.R. Hamasha, Spain, May 2009, R. Piwowarczyk (KRA); J, K – *Neotrinia splendens* (Trin.) M. Nobis, P. Gudkova et A. Nowak, Tajikistan, 30 Jul 1958, Yu. Gusev (LE), China, Quighai, 26 Jul 2010, B. Paszko (KRA); L – *Orthoraphium roylei* Nees, Nepal, 22 Oct 1981, M. A. Farille (E); M – *Stipa grandis* P.A. Smirn., Mongolia, 50 km SW of Choibalsan, 19 Aug 2011, Safronova et al. (KRA); N – *S. bungeana* Trin., Kyrgyzstan, 08 Jul 2015, M. Nobis, A. Nowak (KRA); O – *S. lessingiana* Trin. et Rupr., Kazakhstan, 18 May 2014, M. Nobis (KRA). Abbreviations: lc – long cell (fundamental cell), sc – silica cell (silica body), cc – cork cell, h – hook, p – prickle, mh – macrohair.

Nobis et al., 2013, 2014, 2015, 2016). In *A. splendens*, the fundamental (long) cells are elongate with deeply sinuous side walls; silica bodies are rounded, square to elongated with straight or sinuous edges; cork cells are adjacent to silica bodies; hooks, prickles and macrohairs are sparse and scattered on the whole lemma surface (Fig. 1J–K). Because molecular, macromorphological and micromorphological characters do not support its affiliation to *Achnatherum* as well as to any other related genera from the tribe *Stipeae*, the following transfer is necessary:

***Neotrinia* (Tzvelev) M. Nobis, P. Gudkova et A. Nowak, stat. et gen. nov.**

Basionym: *Achnatherum* sect. *Neotrinia* Tzvelev, Nov. Syst. Vyssh. Rast. 9: 55, 1972.

Type: *Neotrinia splendens* (Trin.) M. Nobis, P. Gudkova et A. Nowak

***Neotrinia splendens* (Trin.) M. Nobis, P. Gudkova et A. Nowak, comb. nov.**

Basionym: *Stipa splendens* Trinius in Sprengel, *Neue Entdeck. Pflanzenk.*, 2: 54, 1821.

Type: (USSR, Transbaikalia) *Agrostis longiaristata*, herb. Fischer (holotype LE!).

Based on the same type: *Lasiagrostis splendens* (Trin.) Knuth (1829, p. 58); *Achnatherum splendens* (Trin.) Nevski (1937, p. 224).

Taxonomic synonym: *Stipa altaica* Trin. (1929, p. 80); *Stipa schlagintweitii* Mez (1921, p. 208); *Sti-*

pa kokonorica Hao (1938, p. 583); *Stipa munroana* Bor (1955, p. 500).

A new section in the genus *Achnatherum*

***Achnatherum* sect. *Pennatherum* M. Nobis, sect. nov.**

Description: Perennial, densely tufted from a short rhizome, old basal sheaths persistent. Leaf blades gray-green, fairly rigid, setaceous; ligules truncate, ca. 1 mm, margin ciliate. Panicle lax. Glumes lanceolate, 5–6 mm, 3-veined with lateral veins short, membranous, smooth, apex sharply acuminate; lemma 3–4 mm, 3-veined, veins convergent at apex, evenly pubescent throughout, apex minutely 2-toothed; awn 2–3 cm, strongly curved near base, column short, twisted, plumose; palea subequal to lemma.

Type: *Achnatherum pellicotii* (Danguy) Röser et H. R. Hamasha, *Plant. Syst. Evol.*, 298: 365, 2012.

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