

A Revision of *Aniselytron* with Some New Combinations in *Deyeuxia* in SE. Asia (Gramineae)

H. M. KORTHOF & J. F. VELDKAMP

Rijksherbarium, Leiden, The Netherlands

EFFECTIVE-PUBLICATION DATE: 7 MAR. 1985

Abstract

Aniselytron Merr. (Gramineae), better known as *Aulacolepis* Hack. (1934), *non* Ettingsh. (1893), has two species in SE. Asia and Malesia. A key and descriptions are given. *Anisachne* Keng is reduced to *Deyeuxia* Beauv. and some new combinations in that related genus are proposed. *Deyeuxia abnormis* Hook. f. is not identical with *D. zenkeri* (Trin.) Veldk., which is an enigmatic species known only from the type from the Nilgiris, India.

Introduction

Aniselytron Merr. resembles *Deyeuxia* Beauv. best in the induration of the lemma but differs in that its lemma is distinctly longer than the lower glume. This feature is so aberrant in the *Aveneae* (including *Agrostideae*) in which, according to most descriptions, the glumes might be as long as or longer than the only or lowest lemma, that *Aniselytron* can not usually be identified with general keys. Its very short callus hairs, its minute, glabrous rachilla process and the usual absence of an arista are causes of the resemblance in the spikelets with those of uniflorous forms of *Poa* Linné. In fact, before it was realized that such species occur in *Poa*, one of its forms was included in *Aulacolepis* Hack. by which name the genus was known until recently. That *Aniselytron* obviously belongs to the alliance of *Agrostis* Linné can be noticed when callus hairs are seen; when present in *Poa*, they are abaxial and then usually somewhat arachnoid or woolly; in *Agrostis* and its related genera, they form a ring around the base of the lemma, often with the lateral hairs somewhat longer and giving the impression that there are two tufts. Moreover, in *Poa*, the lemmas are more or less keeled at the back while in the other genera, they are more rounded.

A similar reduction in glume size, though rarely as extreme as in *Aniselytron*, occurs sporadically in the *Aveneae* as in some species of *Deyeuxia* e.g., *D. abnormis* Hook. f. from India to S. China; *D. exilis* Veldk. and *D. pusilla* (Reeder) Jansen from New Guinea, the Australian *D. gunniana* (Nees) Benth., the circumarctic genus *Arctagrostis* Griseb., and the New Zealand *Simplicia* Kirk (1897). *Simplicia* especially is very similar to *Aniselytron* as was pointed out by Zotov (1971). Indeed, if its two species had been found in Asia, *Aniselytron* of 1910 would probably have been included in *Simplicia*. However, with the present great disjunction, we get the impression that we are dealing with the results of two convergent lines in the reduction of the spikelet, the cause of the apparent resemblance. The difficulty remains that there seem to be no clear differences whereby the two genera can be separated satisfactorily at the generic level. The most obvious distinctions are the width of the leaves: 1.5-3 mm in *Simplicia* and 3-17 mm in *Aniselytron*; the lemma: 3-nerved in *Simplicia* and 5-nerved in *Aniselytron* (although Zotov has remarked that in *S. laxa* Kirk there may be weak additional nerves...); the absence of callus hairs (at least in the single specimen seen by us of the same and neither mentioned nor depicted by Zotov); and the sub-terminal arista.

Zotov and the few other authors who have dwelt on *Aniselytron* repeated Hackel's remark (1907) that having the two proximate nerves of the palea would not make it

distinct from *Aulacolepis* (means "fluted scale"). These nerves are indeed close to one another, with a more or less narrow depression in between, hardly a furrow. The minute rachilla process lies in this depression for which reason it is difficult to detect. It seems to us that Zotov had not actually seen material of *Aniselytron* for such a nervation is present also in at least the isotype of *S. laxa* in Kew. This proximity of the nerves seems to depend on the extent the palea is covered by the lemma; such close-set nerves are sometimes present in species of *Agrostis* and *Deyeuxia* as well.

It is therefore not surprising that Hitchcock (1934) was misled by the apparent similarity when he distinguished between *Aul. clemensae* Hitchc. from Sabah and *Aul. petelotii* Hitchc. from North Vietnam. Again, in 1936, he fell into the trap provided by the uniflorous *Poa* species when he proposed the combination *Aul. epileuca* for a taxon from New Guinea, one which was described by Stapf in *Deyeuxia*. However, it turned out that *Aul. epileuca* is not Stapf's species but another uniflorous *Poa* (see under "Excluded Names"). *Aul. petelotii* has had a rather chequered history: up to now the taxon has been included in *Agrostis*, *Anisachne* Keng and *Deyeuxia*. We regard the species as a member of the last genus.

The first mention of a representative of *Aniselytron* was based on material from Sikkim. Kuntze (1891) thought that it represented a *Milium* Linné. This was soon corrected by Stapf (1895), admitting that he included the species in *Deyeuxia*(!) for technically unsatisfactory reasons. He compared it with his *D. epileuca*, the *Poa* intended by Hitchcock (see above). Hooker f. (1896) also regarded it as a "very anomalous" species for *Deyeuxia*.

Hackel (1907) proposed a separate genus *Aulacolepis* for Kuntze's species and for some collections from Japan which he suspected might prove to be merely subspecies of one taxon. This suspicion was affirmed by Ohwi (1941), who regarded them as varieties while we think that they are merely two local races, not warranting any nomenclatural status.

In a number of instances, some authors have used *Index Nominum Generi-corum* to achieve results by proposing all the new combinations under another generic name without any specialistic knowledge of the group concerned or without a laborious search for relevant material and/or literature. For them entries in the *Index Kewensis* apparently gave enough information. Thus three persons have made all the "necessary" combinations under *Aniselytron*, and a fourth, in the blissful ignorance of that name even proposed a new one, *Neoaulacolepis* (see also Wilson's comment, 1983).

As more collections from different places became available, more taxa were added to *Aulacolepis*. Ohwi (1935) included *Aul. milioides*(!) from Taiwan, which had previously been described as a *Poa*(!) by Honda (1927). As mentioned above, Hitchcock (1934; 1936) distinguished between *Aul. clemensae*, *Aul. petelotii* and *Aul. epileuca*. Ohwi (1956) included *Aul. pseudopoa*(!), a new combination of a species from North Sumatra, described previously by Jansen. The latter, as can be deduced from his correspondence in Leiden, had described it as a *Deyeuxia* on Ms. Vickery's suggestion, who had revised that genus for Australia where some species also have similar relatively short glumes.

The distribution of *Aniselytron* species is very scattered. The plants apparently prefer shaded, moist, rocky ravine floors, places out of reach except perhaps in Japan, and thus material is rare in herbaria. The form of Mt. Kinabalu, for instance, has been collected only by Ms. Clemens along the Masilau River and the Silau basin. The first locality seems close to the Paka Caves, a site frequently visited by botanists. The grass probably grows in the deep gorge below the Caves. Merrill (1910) remarked that *An. agrostoides* was uncommon on Mt. Pulog. As far as we know, it has been collected only twice again [BS 44989 (*Ramos & Edano*); Santos 7854]. The scarcity could be

attributed to its close resemblance with *Agrostis rigidula* Steud. as had been observed by Merrill. That is a rather common grass on Mt. Pulog.

From the present study we think that *Aniselytron* has only two species: one, *An. agrostoides*, occurring in Luzon and in Taiwan, the other, *An. treutleri*, ranging from Sikkim through Assam, north Burma, China, north Vietnam and Taiwan to Japan, Sabah and North Sumatra. The second species has a number of local races as is to be expected in disjunctive populations scattered over such a wide area. In Japan, only one form is rather widely spread but the situation in China is not clear because too few collections are available. The races can only be distinguished by a certain set of characters which occur in a different expression and/or combination in each individual race. Provenance is usually the best guide but is most unsatisfactory. We have therefore refrained from naming them officially. Although they are allopatric, the rank of subspecies automatically and uncritically bestowed on such taxa by some seems to be too honorific for the little-impressive differences.

Aniselytron

Aniselytron Merr.

In Merr. & Merritt, Philip. J. Sc. 5, Bot (1910) 329; Soják, Čas. Nár. Muz. 148 (1980) 202; Raizada & Bennett, Ind. For. 107 (1981) 433. — Type: *Aniselytron agrostoides* Merr.

Aulacolepis Hack. in Fedde, Repert. 3 (1907) 241; Hitchc., J. Washington Ac. Sc. 24 (1934) 290; Ohwi, Bot. Mag. Tokyo 55 (1941) 361; Bor, Grasses (1960) 394; Hsu, Fl. Taiwan 5 (1978) 433; non Ettingshausen (1893). — *Neoaulacolepis* Rauschert, Taxon 31 (1982) 561. — Lectotype: *Aulacolepis treutleri* (O. Ktze) Rauschert = *Aniselytron treutleri* (O. Ktze) Soják.

Tufted perennials, branching extra-vaginally at base. Culms simple, glabrous, smooth, but cataphylls and lowest sheaths finely puberulous. Ligules membranous, enlarging upward, the lower collar-shaped, usually rather thick, outside puberulous, the upper triangular, thinner, glabrous or not. Blades flat, flaccid, slightly unequal-sided, glabrous, smooth or scaberulous. Panicles of lax spikelets. Spikelets somewhat laterally compressed, 1-flowered, articulating above the glumes. Glumes membranous to slightly indurated in fruit, unequal to very unequal, at least the lower one (much) shorter than the lemma. Rachilla process minute, glabrous. Lemma ovate-lanceolate, indurated, scabrous. 5-nerved, mucicous or (rarely) with an apical filiform arista, callus hairs very small, inconspicuous, around the base of the lemma, the laterals \pm longest. Palea as the lemma, nearly completely clasped by it, nerves 2, rather close-set and slightly impressed in between. Lodicules glabrous, sometimes slightly fimbriate, thin, veinless, free. Anthers 3. Styles 2, free at base. Caryopsis ellipsoid, \pm terete, not furrowed; hilum subbasal, punctiform; embryo 0.2-0.25 times the length of the caryopsis.

Distribution. Two species from Sikkim, N. Burma through China to Japan, Taiwan, Luzon, Sabah, N. Sumatra.

Ecology. High mountains, in shaded, moist forest.

Chromosome number. $\times = 7$ (see under *A. treutleri*).

KEY

1. Lateral spikelets with rather uniform, short, up to 1-mm long pedicels. Lower glume virtually absent or a nerveless scale, up to 0.75 mm long, up to 0.2 times the length of the spikelet. Upper glume 1-nerved 1. *An. agrostoides*
1. Lateral spikelets with filiform pedicels of variable length. Lower glume 0.5-2.5 mm long, 1-nerved, 0.25-0.71 times the length of the spikelet. Upper glume 3-nerved 2. *An. treutleri*

1. *Aniselytron agrostoides* Merr.

In Merr. & Merritt, Philip. J. Sc. 5, Bot. (1910) 329; Enum. Philip. Fl. Pl. 1 (1923) 82. — *Aulacolepis agrostoides* Ohwi, Acta Phytotax. & Geobot. 4 (1935) 30; Bot Mag. Tokyo 55 (1941) 361, *comb. ill.* — Type: Merrill 6483 (PNH, † holo; K, L, W Hb. J.V. Santos, *n.v.*), Philippines, Luzon, Mt. Pulog, 2400 m, May 1909.

Aulacolepis agrostoides (Merr.) Ohwi var. *formosana* Ohwi, Acta Phytotax. & Geobot. 4 (1935) 30; Hsu, Taiwan Gr. (1975) 303, t. 46; Fl. Taiwan 5 (1978) 434, t. 1389. *comb. ill.* — Type: Ohwi 2363 (KYO, holo; K), Taiwan, Ilan Co., (Mt.) Taiheisan (Taipingshan), 26 May 1933.

Culms erect to geniculately ascending, up to 90 cm high, sometimes rooting in the lower nodes. Ligule 0.3-1.5 mm high, margin erose to fimbriate. Blades 10-24 cm by 2.3-6 (-8.5) mm. Panicle erect to slightly nodding, usually \pm contracted, to effuse with patent, sometimes slightly reflexed branches, 9-22 by 0.7-13.5 cm diam., axis glabrous, smooth, branches smooth to scaberrulous, lowermost 2-5 together, the longest up to 7.5 cm long, naked in the lower 0.5-0.7th, spikelets 3-15 (-many), pedicels of lateral spikelets 0.3-1 mm long, of the terminal ones much longer. Spikelets 2.5-4 mm long. Lower glume virtually absent to a small, scabridulous, nerveless scale up to 0.75 (-1) mm long, up to 0.2 (-0.3) times as long as the spikelet; upper glume ovate-oblong to ovate-lanceolate, very variable, 1-2.75 mm long, (0.2-) 0.5-0.75 times the length of the spikelet, long-acuminate, 1-nerved, glabrous, smooth. Rachilla process 0.35-0.8 mm long. Lemma with the margins becoming scarious, attenuating upward into an acute to acuminate and then sometimes hook-like apex, muticous; callus hairs 0.05-0.2 mm long. Anthers (0.6-) 1.25-1.5 mm long, yellow. Caryopsis 1.25-1.5 mm long.

Distribution. Taiwan: Chiayi (Mt.) Arisan, ((Mt.) Morrison), Hsinchu ((Mt.) Taihasensan), Hualien (Mt.) Chilaihan, Ilan ((Mt.) Daikansan, ((Mt.) Loyehweisan, (Mt.) Pahsiensan); Malesia; Philippines, Luzon (Mt. Pulog).

Ecology. Mixed montane forest, 2150-2850 m, or open grassland just below the summit of Mt. Pulog (but notes usually lacking on the labels).

Note. Merrill (1910) reported that this species was uncommon on Mt. Pulog. In fact it has been collected only twice again [BS 44989 (*Ramos & Edano*); Santos 7854]. There seem to be no collections present in PNH (Dr. Santos, Manila, *in litt.*). A poor juvenile isotype (W) and some scraps of the second collection and Santos' specimen were all that were available but these fall well into the range of variability shown by the ample Taiwan material. When Ohwi proposed a distinct variety for Taiwan, as far as can be ascertained, he never saw any Philippine material but relied on descriptions only. His proposal cannot stand.

2. *Aniselytron treutleri* (O. Ktze) Soják

Câs. Ndr. Muz. 148 (1980) 202; Bennett & Raizada, Ind. For. 107 (1981) 434. — *Milium treutleri* O. Ktze, Rev. Gen. Pl. 2 (1891) 780. — *Deyeuxia treutleri* Stapf in Hook., Icon. Pl. 24 (1895) t. 2396; Hook. f. Fl. Br. Ind. 7 (1896) 269. — *Aulacolepis treutleri* Hack. in Fedde, Repert. 3 (1907) 242; Honda, J. Fac. Sc. Imp. Univ. Tokyo III, 3 (1930) 195; Schmid, l'Agron. Trop. 13 (1958) 484, f. 2; Bor, Grasses (1960) 394; Hsu, Taiwan Gr. (1975) 305, t. 47; Anon., Icon. Corm. Sin. 5 (1976) 104, t. 7037; Hsu, Fl. Taiwan 5 (1978) 434, t. 1390; *comb. ill.* — Lectotype: *Treutler* 486 (K, holo; L, W; CAL, *n.v.*), Sikkim, Tanglo, 3050 m, 5 August 1874.

Aulacolepis japonica Hack. In Fedde, Repert. 3 (1907) 241; Honda, J. Fac. Sc. Imp. Univ. Tokyo III, 3 (1930) 195; Anon., Icon. Corm. Sin. 5 (1976) 104; *comb. ill.* — *Aulacolepis treutleri* (O. Ktze) Hack. var. *japonica* Ohwi, Bot. Mag. Tokyo 55 (1941) 361; Fl. Japan (1965) 158; *comb. ill.* — *Aniselytron japonicum* Bennett & Raizada, Ind. For. 107 (1981) 434. — *Neoaulacolepis japonica* Rauschert, Taxon 31 (1982) 561. — Lectotype: *Faurie* 6394 (W, holo; P, *n.v.*; KYO, L), Japan, Honshu, Prov. Shinano, Mt. Komagetake, July 1905.

Poa milioides Honda, Bot. Mag. Tokyo 41 (1927) 641. — *Aulacolepis milioides* Ohwi, Acta Phytotax. & Geobot. 2 (1933) 161, 169; *comb. ill.* — *Aulacolepis treutleri* (O. Ktze) Hack. var. *milioides* Ohwi, Acta Phytotax. & Geobot. 6 (1937) 151; *comb. ill.* — *Aniselytron milioides* Bennett & Raizada, Ind. For. 107 (1981) 434. — Lectotype: *Faurie 205* (KYO, holo; L; P, *n.v.*), Taiwan, Chiayi Co., (Mt.) Arisan, 2500 m, December 1914.

Aulacolepis clemensae Hitchc., J. Washington Acad. Sc. 24 (1934) 290; *comb. ill.* — *Aniselytron clemensae* Soják, Čas. Nár. Muz. 148 (1980) 202; Bennett & Raizada, Ind. For. 107 (1981) 434. — *Neoaulacolepis clemensae* Rauschert, Taxon 31 (1982) 561. — Type: *Clemens 34448* (US, holo; BM, G, K, L), Sabah, Mt. Kinabalu, Masilau River, 26 December 1933.

Deyeuxia pseudopoa Jansen, Acta Bot. Neerl. 2 (1953) 363, f. 1. — *Aulacolepis pseudopoa* Ohwi, J. Jap. Bot. 31 (1956) 137; *comb. ill.* — *Aniselytron pseudopoa* Soják, Čas. Nár. Muz. 148 (1980) 202; Bennett & Raizada, Ind. For. 107 (1981) 434. — Type: *Van Steenis 9135* (L, holo; BO, *n.v.*), Sumatra, Aceh, summit Goh Lembuh, 3000 m, 21/22 February 1937.

Culms erect, up to 1 m high, rarely somewhat geniculate or decumbent and rooting in the lower nodes. Ligules 0.5-7.5 mm long. Blades 10-26.5 cm by 3-17 (-21) mm. Panicle effuse, erect, 9-26 by 0.7-15.5 cm diam.; axis smooth; branches scabrid, the lowermost 2-7, usually 5 together, the longest up to 12.5 cm long, naked in the lower 0.45-0.7th, spikelets 7-many; pedicels of the lateral spikelets filiform and variable in length. Spikelets 2.35-4.6 mm long. Glumes usually distinctly unequal, ovate-lanceolate, acute, scabrous; lower glume 0.5-2.6 mm long, 0.25-0.85 times as long as the upper one, 0.2-0.7 times as long as the spikelet, 1-nerved; upper glume 1.6-3.8 mm long, 0.6-1 times as long as the spikelet, 3-nerved. Rachilla process 0.2-1.3 (-2) mm long. Lemma with an acute to acuminate apex, sometimes with a thinner tissue and then sometimes incurved, rarely with an apical, filiform arista up to 0.25 mm long, callus hairs up to 0.8 mm long. Anthers 0.75-1.5 (-2) mm long when chasmogamous, 0.75-1.35 mm long when cleistogamous. Caryopsis 1.25-2 mm long.

Distribution. (Most collections were summarily labeled with often just a rough indication of provenance. Many localities could not be traced, e.g. in Japan. Field notes were usually meager or absent). Sikkim (Jongri, Nanki, Shimong, Tonglo), Burma (Kachin: Uring Bum), China (Guizhou, Fan Ching Shan; Sichuan; north Guangxi), Taiwan (Chiayi, Ilan, Nantou, Taipei), north Vietnam (Fan Si Pan Mts., Chapu), Japan (Honshu: North to Shina; Prov. Kyushu: Bungo, Mt. Kuju), Malesia (Sabah: Mt. Kinabalu; Sumatra: Aceh, Mt. Leuser).

Ecology. Moist, shaded, often rocky places in midmontane to upper montane areas, often in ravines (see also under the entities).

Chromosome number. $2n = 42$ (here published with the kind permission of Dr. T. Tateoka; vouchers: *Tateoka 9389, 9395*, KYO).

Notes. Although local forms seem to be present, the collections were usually so few that no clear idea of their variability could be formed. The differences between the entities, moreover, are expressions of a mixture of recurring characters each time with a slightly different value. We thought that it was therefore premature to describe different taxa for the various localities and have not accepted the varieties *japonica*, *milioides* and *treutleri* of previous authors. Short diagnoses should suffice here as an aid in future research.

Sikkim, Burma ('treutleri'). Lower glume 0.5-1.75 mm long, 0.25-0.8 time length of the upper, 0.2-0.65 time length of the lemma; upper glume 1.6-2.5 mm long, 0.7-0.9 time length of the lemma. Lemma 2.35-2.75 mm long. Rachilla process 0.2-0.4 mm long. Callus hairs up to 0.2 mm long. Anthers 0.75-1.25 mm long, often cleistogamous, if so, then of same size. Alt. 2275-3660 m.

China (Guizhou, Sichuan?, N. Guangxi). Lower glume (0.65-) 1-1.5 mm long, (0.3-) 0.45-0.7 time length of the upper, (0.2-) 0.3-0.5 time length of the lemma; upper

glume 2.15-2.5 mm long, 0.67-0.8 time length of the lemma. Lemma 2.75-3.3 mm long. Rachilla process 0.35-0.75 mm long. Callus hairs 0.25-0.5 mm long. Anthers c. 1.1 mm long. No altitudes given.

Taiwan (*'milioides'*). Lower glume 1-1.9 mm long, (0.33-) 0.45-0.8 time length of the upper, 0.35-0.55 time length of the lemma; upper glume 2.1-2.75 mm long, 0.7-0.85 time length of the lemma. Lemma 2.8-3.5 mm long. Rachilla process 1-1.35 mm long. Callus hairs 0.25-0.3 mm long. Anthers c. 1.25 mm long. An altitude of c. 2500 m was once mentioned, other ecological notes are lacking on the field labels and in the literature.

North Vietnam (and China, Sichuan?). Lower glume 2-2.1 mm long, 0.8-0.85 time length of the upper, 0.5-0.55 time length of the lemma; upper glume 2.35-2.55 mm long, 0.6-0.67 time length of the lemma. Lemma 3.8-4 mm long. Rachilla process 1-1.25 mm long. Callus hairs c. 0.3 mm long. Anthers 1-1.25 mm long. *N.B.* Only 1 collection seen (*Pételot 8025*, L, US), the duplicate in P, which could not be found, was presumably described by Schmid as *Au. treutleri*. His dimensions differ thus: 'lower glume 1.7-2 mm long, upper glume 2.2-3 mm long, lemma 3-4 mm long', measurements resembling those of *'milioides'*. The anonymous author(s) of the *Icon. Corm. Sin.* may have described this form as *Au. japonica*; if so, it would also occur in Sichuan Alt. c. 2900 m in Vietnam.

Japan (*'japonica'*). Lower glume 0.9-1.6 mm long, 0.4-0.65 time length of the lemma; upper glume 2-3 mm long, (0.6-) 0.65-0.85 (-0.95) time length of the lemma. Lemma (2.65-) 3-3.55 mm long. Rachilla process (0.6-) 0.75-1.3 (-2) mm long. Anthers 1-1.35 (-2) mm long when chasmogamous, 0.75-1.35 mm long when cleistogamous. Alt. 1300-2500 m. $2n = 42$. *N.B.* Some specimens have dorsally pilose lemmas.

Sabah (*'clemensae'*). Lower glume 2-2.5 mm long, 0.7-0.8 time length of the upper, 0.55-0.7 time length of the lemma; upper glume 2.85-3.25 mm long, 0.8-1 time length of the lemma. Lemma 3.25-3.5 mm long. Rachilla process 0.4-1.15 mm long. Callus hairs 0.4-0.5 mm long. Anthers 1.25-1.5 mm long. Alt. c. 2100 m, with *Astilbe*, *Galium*, *Gunnera*, *Juncus*. Only found by Ms. Clemens!

Sumatra (*pseudopoa*). Lower glume 1.9-2.6 mm long, 0.55-0.75 time length of the upper one, 0.45-0.65 time length of the lemma; upper glume 3-3.8 mm long, 0.75-0.95 time length of the lemma. Lemma 3.75-4.6 mm long. Rachilla process 0.35-1.15 mm long. Callus hairs 0.25-0.35 mm long. Anthers 1-1.5 mm. Alt. 2500-3350 m. *N.B.* The lemmas in *Van Steenis 8660* and *De Wilde & De Wilde-Duyfjes 16816* are sparsely pilose on the midrib and the outer nerves, those in *Van Steenis 9135* and *De Wilde & De Wilde-Duyfjes 16371* are glabrous.

Excluded names and some new combinations in *Deyeuxia*

1. *Deyeuxia abnormis* Hook. f.

Fl. Br. Ind. 7 (1896) 268; Keng, J. Washington Acad. Sc. 48 (1958) 188, *in passim*. — Lectotype: *Hooker f. & T. Thomson s.n. (Agrostis 12)*, (K, holo, *n.v.*; L), India, Meghalaya, Mt. Khasia, 1525 — 1830 m. (Here designated).

Agrostis pleiophylla Mez In Fedde, Repert. 17 (1921) 301. — Syntypes: *C.B. Clarke s.n.* (B, †, holo; K, *n.v.*), Himalaya, Darjeeling; Khasia, Soynung (probably syntypes of *D. abnormis*).

Aulacolepis petelotti Hitchc. J. Washington Acad. Sc. 24 (1934) 291; Schmid, l'Agron. Trop. 13 (1958) 484, *comb. ill.* — *Aniselytron petelotii* Soják, Cäs. Nár. Muz. 148 (1980) 202; Bennett & Raizada, Ind. For. 107 (1981) 434. — *Neoaulacolepis petelotii* Rauschert, Taxon 31 (1982) 561. — Type: *Pételot 4743* (US, holo; L; P, *n.v.*), north Vietnam, Fan Si Pan Mts, Chapu, 1900 m, August 1933.

Anisachne gracilis Keng, J. Washington Acad. Sc. 48 (1958) 117, f. 2; Anon., *Icon. Corm. Sin.* 5 (1976) t. 7036. — Type: *Hou Hsueh-Yuh 2143* (N, holo, *n.v.*), China, Kweichow, Pichieh Hsien, 1440 m, 1 June 1943.

That *Deyeuxia abnormis* is a rare but rather widely distributed species in SE. Asia was unknown until now as the species in each area went by a different name. When Keng described *Anisachne gracilis* he actually did think of *D. abnormis* but in the absence of material had to rely on Hooker f.'s description (1896) of it. Moreover, he remarked that he would have included his new species in *Deyeuxia* if the glumes had been longer. We now know (see also the Introduction) that glumes shorter than the lemma do occur sporadically in *Deyeuxia*. The additional presence of a relatively thickish, subterminal aristule, a hairy rachilla process, and fairly long callus hairs led us therefore to agree with Hooker f. that the species is better accommodated in *Deyeuxia*. Although we have not seen Keng's original material his description and plate are a good match for the material of *Au. petelotii* and *D. abnormis*.

Agrostis zenkeri Trin. was equated with *D. abnormis* Hook. f. by Bor (1954) in an extensive discussion on its provenance and identity. However, having seen the type specimens of both, we have to disagree with his conclusion and it would seem that the problem is even more complicated and enigmatic.

The description of *Ag. zenkeri* as given by Bor does not fit the actual type, but refers to the true *D. abnormis*, which is a different species. Both belong to *Deyeuxia* as accepted here and a new combination is necessary:

2. *Deyeuxia zenkeri* (Trin.) Veldk. comb. nov.

Agrostis zenkeri Trin., Mém. Acad. Sc. St. Pétersburg VI, 6 (1841) 363; Steud., Syn. 1 (1854) 170; Hook. f., Fl. Br. Ind. 7 (1896) 258, sp. dub.; Bor, Kew Bull. (1954) 441; Grasses (1960) 392. — Type: Schmid, s.n. (?) in Hb. Zenker (LE, holo; Kew neg. 2303), India, Tamil Nadu, Nilgiris.

The type of *D. zenkeri* consists of a single flowering culm, slightly geniculate, c. 35 cm long, with 5 leaves but without a base. Its life cycle can therefore not be determined. The internodes are glabrous, smooth, and also the sheaths, although the uppermost is slightly retrorsely scaberulous. Ligules truncate, erose, scaberulous outside, the lowermost longest, 2.25 mm long. Blades infolded, slightly expanded at the very base, the largest 4.5 cm long, 2.25 mm wide, smooth, glabrous. Panicle lax, spikelets few, 6.5 by 4.5 cm. Axis, branches, and pedicels smooth, axils swollen, glabrous. Branches short, filiform, wavy, the 2 lowermost together, the longest 3 cm long, spikelets 8, nearly perpendicularly forked several times, the pedicels subequal, 3-7 mm long, apex clavate, the spikelets apparently all terminal at the end of the branches. Spikelets 2.6-3.25 mm long. Lower glume as long as the spikelet, 0.1-0.3 mm the length of the upper, 1.05-1.15 times as long as the lemma. Lemma 2.25-2.95 mm long, 5-nerved, microscopically scaberulous, apex muticous, 5-dentate, callus hairs c. 1 mm long, process c. 0.5 mm long with c. 1-mm long hairs. Palea as long as the lemma to slightly longer. Anthers c. 1.2 mm long (1 seen).

The inflorescence of *D. zenkeri* is reminiscent of the plate of *Ag. tenuis* in Hubbard's well-known 'Grasses' (1968, f. 300), but with much fewer spikelets and is quite different from that of *D. abnormis*, as can be seen in Keng's plate of *Anisachne gracilis*, although that plate seems to have been based on a rather depauperate specimen. There the panicle is contracted with nearly erect, rather long, more or less straight, scaberulous branches with many appressed spikelets, usually with short, obconical (0.75-1 or more mm long) pedicels. The glumes and palea are distinctly shorter than the 5- but not the 3-nerved lemma, which often has an inconspicuous, subapical, straight arista hardly exceeding its apex. The anthers are 0.8-1 mm long.

The species was named after J. C. Zenker by Trinius and described from the Nilgiris. We agree with Bor that the type was probably collected by B. Schmid, who gave his material to Zenker to study (he never was in India) and that Zenker apparently passed on the grasses to Trinius. Now, no matching specimens have been collected ever since in the area, under this or another name and mention is not even made in the local floras of Fyson (Fl. Nilg. & Puln., 1915) and Fischer (in Gamble, Fl. Presid. Madras 3, 1928). So either this represents a very rare or overlooked species, or a mix-up has

taken place and a non-Indian species was instead represented. We have been unable, however, to identify it with anything else. Because of the smooth, short, forked branches of the panicle, the long pedicels, the smooth glumes, the relatively short callus hairs (c. 1 mm long) and process (c. 0.5 mm long, overlooked by Trinius), and the glabrous, dentate, at least the unawned lemma here, it seems to differ from any American, Asian, Australian, European, or Indian species known to us.

3. *Deyeuxia brachytricha* (Steud.) Veldk., *comb. nov.*

Calamagrostis brachytricha Steud. Syn. 1 (1854) 189. — *Calamagrostis brevipila* Steud. ex Miq., Cat. Mus. Lugd. Bat. 1 (1870) 112, *nomen* (copied from label but the name had been changed by Steudel, 1854). — *Calamagrostis arundinacea* (Linne) Roth var. *brachytricha* Hack., Bull. Hb. Boiss. 7 (1899) 652. — *Deyeuxia silvatica* (Schrad.) Kunth var. *brachytricha* Hack. ex Rendle, J. Linn. Soc. London, Bot. 36 (1904) 396; Ohwi, Fl. Jap. (1965) 147. — Type: *Anon.*, s.n. (L, holo, '*Calamagrostis brevipila*' Steud. ms.), Japan, probably ex Hb. *Von Siebold* in view of the rice-paper label with Japanese handwriting (For further synonymy see Ohwi, 1965).

When regarded as a variety, the epithet should be taken from *Calamagrostis varia* (Schrad.) Host var. *longiaristata* Korsh., Acta Hort. Petrop. 12 (1892) 420 ('longearistata'), which is older than Hackel's use of '*brachytricha*'.

4. *Deyeuxia debilis* (Hook. f.) Veldk., *comb. nov.*

Calamagrostis debilis Hook. f., Fl. Br. Ind. 7 (1896) 262. — *Agrostis debilis* Bor, Grasses (1960) 387, non Poir. (1810). — *Agrostis neodebilis* Bennett & Raizada, Ind. For. 107 (1981) 433. — Type: *Hooker f.*, s.n. ('*Calamagrostis*'), (K, holo; L), Sikkim, Chola, 3050 m.

Aniselytron agrostoides Marr. J. V. Santos no. 7854

	Reduced xerox copy of original illustration.	Actual size of specimen
	Magnification	
a. Habit of plant	X 1.43	49 cm. tall
b. Junction between sheath & blade	X 10.32	blade 2.3 mm wide ligule 1.4 mm long
<i>Spikelet</i> (3 views)	X 24.5	2.9 mm long
c. lateral view:		
Glume I	.....	0.17 mm long
Glume II	.....	1.2 mm long
d. dorsal view		
e. ventral view		
<i>Lemma</i>	X 24.5	2.8 mm long
f. lateral view:		
hairs of callus	.....	0.05 — 0.2 mm long
g. spread out lemma	.....	2.8 mm long 1.4 mm wide
		— 2.7 mm long
<i>Palea</i> (3 views)	X 24.5	
h. lateral view		
i. dorsal view:		
rachilla produced into an awn	.....	0.5 mm long
j. ventral view		
k. Pistil and stamens	X 24.5	2.4 mm long ovary 1.23 mm long style 0.4 mm long stigma 0.8 mm long anther 0.86 mm long filament 1.75 mm long lodicules 0.3 mm long
l. <i>Caryopsis</i>	X 24.5	1.35 mm long 0.35 mm wide



Fig. 1. *Aniselytron agrostoides* (Santos 7854).

a. Habit; b. ligule; c. spikelet lateral view; d. id., dorsal view; e. id., ventral view; f. lemma, lateral view; g. id., flattened; h. palea lateral view i. id., dorsal view j. id., ventral view; k. pistil and stamens; l. caryopsis. (a' x 0.9; b: x 6.7; c-l: x 16.

5. *Deyeuxia epileuca* Stapf

Trans. Linn. Soc. London, Bot. II, 4 (1894) 247, t. 20c, 10-16. — *Aulacolepis epileuca* Hitchc., Brittonia 2 (1936) 177, *pro comb. comb. ill.* — *Aniselytron epileuca* Soják, Cás. Nár. Muz. 148 (1980) 202 (*'epileucum'*); Bennett & Raizada, Ind. For. 107 (1981) 434. — Type: *Haviland 1401* (K, holo), Sabah, Mt. Kinabalu, 3200 m.

= *Poa epileuca* (Stapf) Stapf in Hook., Icon. Pl. 27 (1899) t. 2607, *in obs.*; t. 2608.

This has long been a misunderstood taxon, partly because the spikelet is uniflorous, partly because it has generally been confused with *Poa papuana* Stapf (e.g., by Hitchcock, 1936), *Poa wisselii* Jansen (cf. Chase, J. Arn. Arb. 24, 1943, 84) and other uniflorous *Poa* species (see also Veldk. in Van Royen, Alp. Fl. N. G. 2, 1980, 1100). For the differences with *Aniselytron* see the Introduction.

6. *Deyeuxia mazettii* Veldk., *nom. nov.*

Calamagrostis stenophylla Hand.-Maz., Symb. Sin. 7 (1936) 1298, t. 40, f. 1, *non D. stenophylla* Jansen (1952). — Type: *Handel-Mazetti 5173* (W, holo, n.v.; L), China, Sichuan, Lungchushan Mts., Huili, 3100-3400 m, 16 September 1914.

Index of collectors

Only numbered collections have been included. Specimens cited in literature but not seen are also included with their identifications (between brackets) when these seemed acceptable; otherwise they have been deleted.

BS 44989 (Ramos & Edano): 1.

Ching 6062: 2; Chuang 316: 1; Clarke 26044, 26046, 27482, 27438, Clemens 29692, 34448, 34448-A: 2.

Faurie 205, 6394, 6397: 2; Fukuyama 4778: 1.

Henry 4777, Hosomi 8970: 2; Hsu 437: 1; 5942: (2); 5942-A, Huang *et al.* 5766: (1).

Kao 5201: (2); 5868: (1); King 3101, Kingdon Ward 21568, Kunio 35886, Kuntze 2396: 2; Kuoh 1297, 7453: (1).

Matsuda Gram. 10, T-381: (2); Merrill 6483: 1.

Ohwi 2363, 2485, 3548, 3623: 1; Oka 35891: 2; Okamoto 32: 1.

Pételot 8025: 2.

Santos 7854, Shimizu & Chuang 20182, Shimada 5103-B: 1; Van Steenis 8660, 9135, Steward *et al.* 514, Sun Yat Sen Univ. 51196: 2.

Tagawa 389, 3856: 2; Tamura & Koyama 23353: 1; Tanaka 15970, 25701, Tateoka 9389, 9395, Treutler 486: 2.

De Wilde & De Wilde-Duyfjes 16371, 16816: 2.

Acknowledgements

This revision was started by Ms. H. M. Korthof during a course in advanced Angiosperm taxonomy at the Rijksherbarium, Leiden. It was finished by Dr. J. F. Veldkamp. The Keepers and Curators of BM, BO, G, K, KYO, L, MAK, NY, SING, TI, UC, US, and W are gratefully acknowledged for making available the necessary materials. From LE the type of *Ag. zenkeri* Trin. was received for inspection. No specimens could be found in P by JFV and in PNH by Dr. J. V. Santos (Manila), but

Dr. Santos did have one in his private collection (dupl. in L. now), from which Mr. L. M. Gregorio prepared the drawing, which is reproduced here with their kind permission and we are most grateful. Dr. T. Tateoka, Tokyo, kindly allowed us to cite his unpublished chromosome count for the Japanese form of *An. treutleri*.

Literature Cited

- Bor, N. L. (1960). *The grasses of Burma, Ceylon, India and Pakistan*: 392, 394. Oxford.
- Ettingshausen, C. von. (1893). Über fossile Pflanzenreste aus der Kreideformation Australiens. *Sitzungsber. Kais. Akad. Wiss. Wien, Math-Naturw. Classe* 102, 1: 135, 147.
- . (1895). Beiträge zur Kenntniss der Kreideflora Australiens. *Denkschr. Kais. Akad. Wiss. Wien, Math-Naturw. Classe* 62: 12, t. 1. f. 10.
- Hackel, E. (1907). Gramineae novae. II. In Fedde, *Repert.* 3: 241-244.
- Hitchcock, A. S. (1934). New species of *Aulacolepis* and other grasses. *J. Washington Acad. Sc.* 24: 290-291.
- . (1936). Botanical results of the *Archibold* Expedition. 1. Papuan grasses collected by L. J. Brass. *Brittonia* 2: 117.
- Honda, M. (1927). Revisio graminū Japoniae. XIV. *Bot. Mag. Tokyo* 41: 641.
- Hooker, J. D. (1896). *Flora of British India* 7: 269. London.
- Jansen, P. (1953). Notes on Malaysian grasses. III. *Acta Bot. Neerl.* 2: 363-265, f. 1.
- Keng, Y. L. (1958). Two new genera of grasses from China. *J. Washington Acad. Sc.* 48: 117-118, f. 1.
- Kirk, T. (1897). *Trans. & Proc. New Zeal. Inst.* 29: 497, t. 44.
- Kuntze, O. (1891). *Revisio genera plantarum* 2: 780. Leipzig.
- Merrill, E. D. (1910). In E. D. Merrill & M. L. Merritt, The flora of Mount Pulog. *Philip. J. Sc.* 5, *Bot.*: 328-330.
- Ohwi, J. (1933). Symbolae ad floram Asiae orientalis. 9. *Acta Phytotax. & Geobot.* 2: 161-162.
- . (1935). Symbolae ad floram Asiae orientalis. 11. *Acta Phytotax. & Geobot.* 4: 30.
- . (1941). The tribe *Agrostideae* of Japan, excluding the genus *Calamagrostis*. *Bot. Mag. Tokyo* 55: 361.
- . (1956). Notes on some plants from Japan and its neighbours. (2). *J. Jap. Bot.* 31: 137.
- Stapf, O. (1895). *Deyeuxia treutleri* Stapf, in Hook., *Icon. Pl.* 24: t. 2396.
- Wilson, K. L. 1983. Publication of superfluous names. *Taxon* 32: 644-645.
- Zotov, V. D. 1971. *Simplicia* Kirk (Gramineae). *New Zeal. J. Bot.* 9: 539-544.