

POACEAE

A NEW SPECIES OF *PENTAMERIS* FROM JONASKOP, SOUTH AFRICA

INTRODUCTION

The genera *Pentameris* P.Beauv., *Prionanthium* Desv. and *Pentaschistis* (Nees) Spach have received much attention in the last two decades.

Pentaschistis was revised by Linder & Ellis (1990), who recognised 68 species from the whole of Africa and Madagascar, as well as the Indian Ocean island of Amsterdam. Subsequently, Sylvia Phillips investigated the taxonomically very complex species-groups from the tropical African mountains (Phillips 1986, 1994, 1995a, b), and Chloé Galley described three new species from

the southwestern Cape of South Africa (Galley & Linder 2006). At the moment, the authors recognize 73 species, and six infraspecific taxa. However, this number may need correcting, as the species delimitation in the difficult *P. pallida* group may need revising, and the current resolution of the *P. pictigluma* group may also not be optimal.

Pentameris was revised by Nigel Barker (1993), and *Prionanthium* by Gerrit Davidse (1988). During a recent field trip in South Africa, the first author located yet another new species, indicating that there may well still be even more undiscovered species, especially in the

species-rich and topographically complex mountains of the Cape Floristic Region.

Recent molecular phylogenetic work (Barker *et al.* 2007; Pirie *et al.* 2008) has indicated that these three genera are phylogenetically intermingled. It is evident that the generic delimitations, especially of *Rytidosperma* sensu Clayton & Renvoize (1986), cannot be resolved with local analyses. This research has already revealed the existence of several groups of genera within the Danthonioideae (Barker *et al.* 2000, 2007). A detailed phylogenetic analysis of *Pentaschistis* (Galley & Linder 2007) revealed that the genus is paraphyletic relative to *Pentameris* and *Prionanthium*. As a result, we will include *Pentaschistis* within *Pentameris* (Linder *et al.* in press). Consequently, the new species is described in the genus *Pentameris*.

***Pentameris ellisii* H.P.Linder, sp. nov.**

A *Pentaschistis barbata* foliis involuto, columna aristas limbis aequans, et indumento lemmatis differt.

TYPE.—Western Cape, 3319 (Worcester): Jonaskop, 33° 56.318' S, 19° 31.153' E, 970 m, (–DC), 24 January 2008, H.P. Linder 7898 (Z, holo.; K, PRE, BOL, MO).

Plants perennial, caespitose, without stolons or rhizomes. Culms glabrous, straight, with 8 nodes, 400–600 mm tall; basal sheaths pale, glabrous; culm bases not swollen; prophylls bilobed, upper margin bristly, keels remaining parallel, scaberulous, extended up to 0.5 mm long, scaberulous awns; innovation buds intravaginal. Leaves cauline; ligule ciliate, simple, 0.3–0.5 mm long; sheath mouth villous (along the converging upper sheath margins); leaf blades 50–150 × 0.5–0.7 mm, very sparsely long-villous, rolled, apically blunt, soft-tipped. Inflorescence with 50–100 spikelets, widely paniculate, obliquely ovate to linear-lanceolate, 50–100 × 40–60 mm; internodes and pedicels longer than spikelets, glabrous, densely set with multicellular glands; nodes villous. Spikelets 2-flowered, all florets bisexual. Glumes both similar, 5.5–6.0 × ± 2 mm, acute to acuminate, glabrous, base and most of back purple, upper marginal areas yellow-green, central nerve well developed, densely set with multicellular glands, lateral nerves 2, poorly developed, overtopping florets. Callus and rachilla internode less than 3 mm long, junction oblique, two lateral hair tufts overtopping base of lemma, callus rounded. Lemmas 2.5–2.8 mm long, chartaceous, backs smooth, dull, with 9 veins, sparsely villous between keel and first set of nerves; shape of lemma lobes acute, 0.25–0.30 mm long, outer margins villous; setae 2.0–2.5 mm long, exerted from glumes, fused to inner margin of lemma lobes; awn 7–8 mm long, differentiated into a tightly corkscrewed column 3.4–4.5 mm long, and a scaberulous limb 3.5–4.5 mm long. Palea linear, ± 3 mm long, slightly overtopping lemma sinus, 0.3–0.5 mm wide, apically rounded to truncate, ciliate, otherwise totally glabrous; keels parallel, scarcely reaching palea apex. Lodicules 2, glabrous, cuneate, with 1 or 2 veins. Anthers yellow, 3 mm long. Ovary stalked, glabrous, style bases separated by a small indented outgrowth. Flowering time: January. Figure 18.

Etymology: the specific epithet honours Roger Ellis, who worked for many years at the Botanical Research

Institute, Pretoria, and published extensively on the southern African grasses.

Diagnostic characters and relationships: the affinities of this species are obscure, as it shows diverse morphological relationships. The presence of glands, the size of the spikelet, and the inflorescence structure suggest an affinity to *Pentameris barbata* (Nees) Steud. However, the species differs by the position of the glands (absent from the leaves, present on pedicels and glumes), by the rolled leaves, by the awns with the column equalling the limb, and by the sparse indumentum on the lemma. In general appearance there is a similarity to *P. tortuosa* (Trin.) Nees, with which it shares the dark colour of the spikelets and the rolled leaves, but it differs by the presence of glands and by the generally smaller florets (as well as numerous other attributes). The growth form suggests an affinity to the common *P. colorata* (Steud.) Galley & H.P.Linder, ined., but the small, numerous spikelets and the presence of glands offer a distinction.

Distribution and ecology: this species is known from a single collection from the northern slopes of Jonaskop, where it was collected at 970 m on shallow soils over sandstone, in young fynbos (± 10 yrs after fire) with *Protea neriifolia*, in well-drained soil. Despite the late season, the population was in full flower. The species was common in the area, and was very distinctive by the open, dark-coloured inflorescences.

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REFERENCES

- BARKER, N.P. 1993. A biosystematic study of *Pentameris* (Arundineae, Poaceae). *Bothalia* 23: 25–47.
- BARKER, N.P., GALLEY, C., VERBOOM, G.A., GILBERT, M. & LINDER, H.P. 2007. The phylogeny of the austral grass subfamily Danthonioideae: evidence from multiple data sets. *Plant Systematics and Evolution* 264: 135–156.
- BARKER, N.P., MORTON, C.M. & LINDER, H.P. 2000. The Danthonioideae: generic composition and relationships. In S.W.L. Jacobs & J. Everett, *Grasses: systematics and evolution*: 221–230. CSIRO, Melbourne.
- CLAYTON, W.D. & RENVOIZE, S.A. 1986. *Genera graminum. Grasses of the world*. Her Majesty's Stationary Office, London.
- DAVIDSE, G. 1988. A revision of the genus *Prionanthium* (Poaceae: Arundinaceae). *Bothalia* 18: 143–153.
- GALLEY, C. & LINDER, H.P. 2006. New species and taxonomic changes within *Pentaschistis* (Danthonioideae, Poaceae) from Western Cape, South Africa. *Bothalia* 36: 157–162.
- GALLEY, C. & LINDER, H.P. 2007. The phylogeny of *Pentaschistis* (Danthonioideae, Poaceae) based on cpDNA, and the evolution and loss of complex characters. *Evolution* 61: 864–884.
- LINDER, H.P., BAEZA, C.M., BARKER, N.P., GALLEY, C., HUMPHREYS, A.M., LLOYD, K.M., ORLOVICH, D.A., PIRIE, M.D., SIMON, B.K., WALSH, N.G. & VERBOOM, G.A. In press. A taxonomic classification of the Danthonioideae (Poaceae). *Annals of the Missouri Botanical Garden*.
- LINDER, H.P. & ELLIS, R.P. 1990. A revision of *Pentaschistis* (Arundineae: Poaceae). *Contributions from the Bolus Herbarium* 12: 1–124.
- PHILLIPS, S.M. 1986. Four new grasses from North East tropical Africa. *Kew Bulletin* 41: 1027–1030.
- PHILLIPS, S.M. 1994. Variation in the *Pentaschistis pictigluma* complex (Gramineae). In J.H. Seyani & A.C. Chikuni, *Proceedings of the XIII Plenary Meeting of AETFAT, Zomba, Malawi, 2–11*



FIGURE 18.—*Pentameris ellisii*, Linder 7898: A, several tillers; B, portion of inflorescence; C, glumes; D, spikelet; E, floret from side; F, lemma from back; G, anther; H, palea from back with callus; I, palea from front, showing lodicules and gynoecium. Scale bar: A, B, 30 mm; C, D, 2.5 mm; E–I, 4 mm. Artist: Jasmin Baumann.

April 1991: 359–372. National Herbarium and Botanic Gardens of Malawi, Zomba.

PHILLIPS, S.M. 1995a. A new species of *Pentaschistis* (Gramineae) from Ethiopia. *Kew Bulletin* 50: 615–617.

PHILLIPS, S.M. 1995b. Poaceae (Gramineae). In I. Hedberg & S.V. Edwards, *Flora of Ethiopia and Eritrea*: 1–420. The National Herbarium, Addis Ababa University, Addis Ababa.

PIRIE, M.D., HUMPHREYS, A.M., GALLEY, C., BARKER, N.P., VERBOOM, G.A., ORLOVICH, D., DRAFFIN, S.J., LLOYD, K., BAEZA, C.M., NEGRITTO, M., RUIZ, E., COTA, J.H.S.,

REIMER, E. & LINDER, H.P. 2008. A novel supermatrix approach improves resolution of phylogenetic relationships in a comprehensive sample of danthonioid grasses *Molecular Phylogenetics and Evolution* 48: 1106–1119.

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