

Ornithogalum perdurans A.P.Dold & S.A.Hammer, sp. nov., *O. juncifolium* Jacq. affinis sed folio semitereti pagina supera tenuiter canaliculata atroviridi et tota pagina rugosa cum sulcis plus minusve parallelis transversis undulatisque et subinde trichomatibus brevibus rigidis albidis omnino differt.

TYPE.—Eastern Cape, 3325 (Port Elizabeth); Kommadagga Farm, Kommadagga, (–BB), 500 m, 6-9-1999, Dold & Hammer 4441 (GRA, holo.).

Plant xerophytic, dwarf. *Bulb* globose, epigeal, 20–30 mm diam.; outer tunics thin, wrinkled, pale brownish grey, not neck-forming; inner tunics thin, clasping, persistent, transparent with green venation, narrowing abruptly to leaf base. *Leaves* 4–13, persistent, semi-terete, linear, 40–60 × 1.0–1.4 mm, erect, wiry, twisting 2–3 times, narrowly channelled adaxially, apices subacute, dark green (almost black), entire surface rugose with ± parallel, undulating, transverse grooves, with occasional short, stiff, whitish trichomes 0.6 mm long throughout. *Raceme* solitary, 20–40-flowered; peduncle 190–250 mm long, up to 1.2 mm diam., stiffly erect, glabrous, dark shiny green; bracts deltoid, 4.4 × 2.8 mm, auriculate, clasping, attenuate, transparent with fawn-coloured keel; lower pedicels longest, held at ± 45°, 7 mm long, up to 0.8 mm diam., green. *Perianth* segments spreading–reflexed; inner elliptic, up to 6.4 × 2.8 mm; outer ovate, 7.0–7.4 × up to 3.2 mm, pale fawn-coloured with thin, green midrib (turning brown at senescence), apices incurved. *Stamens* patent; filaments lanceolate, broadest just above base, flattened, white, outer up to 4.5 × 0.8 mm, inner up to 4.5 × 1.2–1.6 mm; anthers ovoid, up to 1.4 × 0.6 mm; ovary ovoid, up to 3 × 2 mm, green; style up to 2.5 mm long, terete, white; stigma 3-lobed, densely glandular-haired,

1 mm broad, white. *Capsule* ovoid-acute, 4.5–5.0 × 3–4 mm, deeply 3-lobed, membranous, fragile, apices separating, becoming erect at dehiscence, pale brown, perianth segments persistent, drying and withering irregularly, equal to or just longer than capsule, pale brown with dark brown midrib. *Seed* angular, up to 1.4 × 0.5 mm, rugose, black. Figure 10.

Ornithogalum perdurans falls into subgenus *Aspasia* (Salisb.) Oberm. emend. U.Müll.-Doblies & D.Müll.-Doblies section *Linaspasia* U.Müll.-Doblies & D.Müll.-Doblies series *Juncifolia* U.Müll.-Doblies & D.Müll.-Doblies together with *O. juncifolium* but is distinguished from that species (Obermeyer 1978; Müller-Doblies & Müller-Doblies 1996) primarily on vegetative characters, although some differences also occur in floral morphology (Table 2). The long-lived leaves (persisting for over two years), are almost black in colour and are semi-terete in section with a narrow groove along the upper surface and weak longitudinal ribs on the abaxial surface, occasional, scattered white trichomes are found throughout. The entire leaf surface is rugose with ± parallel, undulating, transverse grooves within which fine sand particles are held firmly (Figure 11A, B), giving the leaf a dry, dusty appearance, not easily removed even with washing. This phenomenon in the suborder Liliiflorae has been suggested to be an adaptation against herbivory, high insolation and wind abrasion (Neinhuis *et al.* 1996). The leaves do not sheath at the base and, being persistent, do not form a fibrous neck of old leaf bases. The specific epithet *perdurans* refers to the perennial leaves. A single inflorescence is produced. The perianth segments are 6.4–7.4 mm long. The deciduous leaves of *O. juncifolium* are filiform to linear (involute or flat), conspicuously longitudinally ribbed abaxially with



FIGURE 10.—*Ornithogalum perdurans*, Dold & Hammer 4441. A, plant habit; B, inflorescence in bud; C, inflorescence at anthesis; D, perianth. Scale bars: 10 mm.

strigose margins (Figure 11C) and are green in colour. Sheathing at the base, the leaves form a membranous neck that persists and often later becomes fibrous. One to three inflorescences are produced. The perianth segments are 7–10 mm long.

Although Obermeyer (1978) includes 16 synonyms for the variable *O. juncifolium*, only one of which is resurrected by Müller-Doblies & Müller-Doblies (1996), type material of all of these has been examined and the leaf characters of *O. perdurans* are distinctive. *O. comp-*

TABLE 2.—Morphological differences between *Ornithogalum perdurans* and *O. juncifolium*

	<i>O. perdurans</i>	<i>O. juncifolium</i>
Leaf	long-lived almost black semi-terete weakly longitudinally ribbed and rugose with undulating transverse grooves occasional short, stiff, whitish trichomes throughout not membranous sheathing fibrous neck absent	deciduous variably green filiform to linear strongly longitudinally ribbed margin strigose basally membranous sheathing fibrous neck present or absent
Raceme	1	1–3
Perianth segments	6.4–7.4 mm long	7–10 mm long

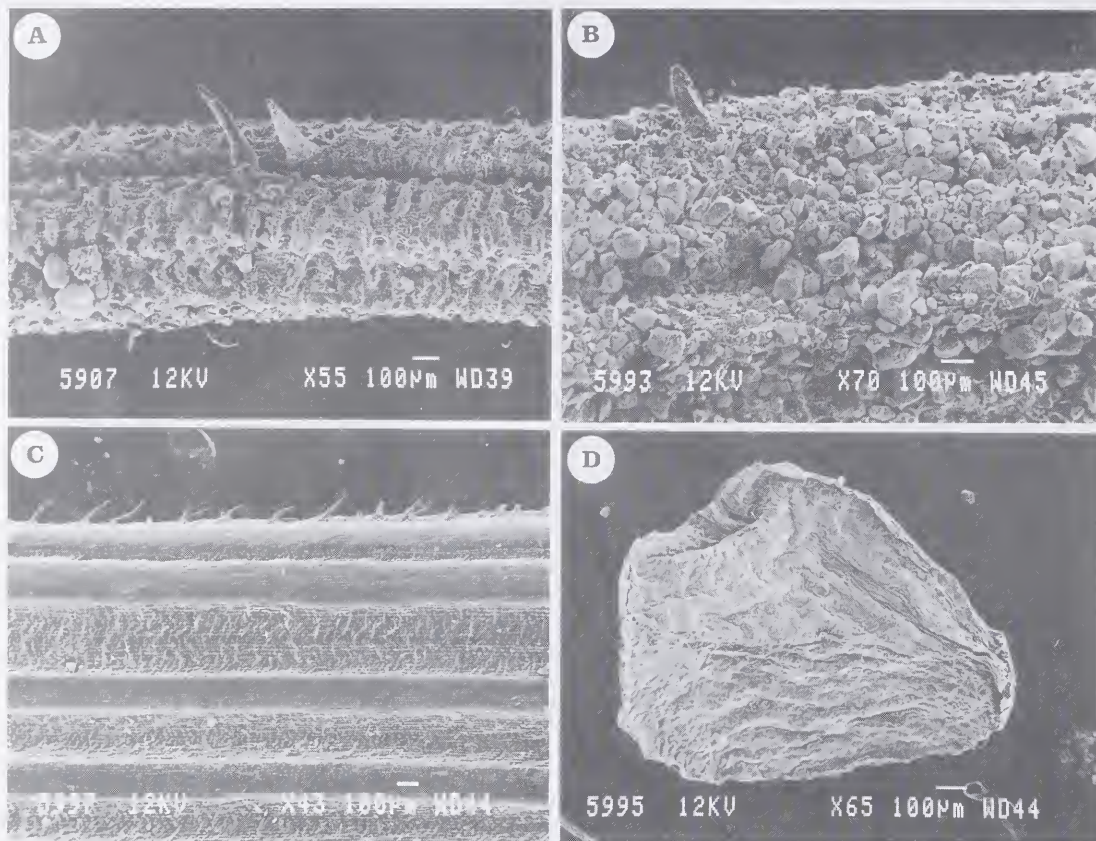


FIGURE 11.—A, B, D, *Ornithogalum perdurans*, Dold & Hammer 441. A, leaf surface with sand particles removed showing undulating transverse grooves; B, leaf surface showing strongly adhering sand particles; D, seed. C, *O. juncifolium*, leaf showing longitudinally ribbed surface with strigose margin. Dold 447. Scale bars: 100 µm.

tum Baker and *O. sardienii* Van Jaarsv. have erect, wiry leaves resembling those of *O. perdurans*, however the former is distinguished by its flattened lamina, without adhering sand particles, and conspicuously thickened, ± cartilaginous margin. Furthermore, the lower pedicels are 2–3 mm long, whereas the lower pedicels of *O. perdurans* are up to 7 mm long. *O. sardienii* is easily distinguished by its unique mucronate leaf and tuberculate ovary.

Ornithogalum perdurans is known from two localities, Table Farm, 12 km west of Grahamstown (33°10'50"S 26°25'15"E), at an altitude of 550 m, with an average annual rainfall of 389 mm (R. White pers. comm., Table Farm, Grahamstown 2002), and Kommadagga Farm, 60 km west of Grahamstown (33°09'30"S 25°53'00"E), at 500 m, with an average annual rainfall of 420 mm (J. Moolman pers. comm., Kommadagga Farm) (Figure 12). The vegetation type is classified as Eastern Mixed Nama-Karoo by Hoffman (1996), which was previously known as False Karroid Broken Veld (Acocks 1988). Dominant species at these localities are *Aristida congesta*, *Felicia muricata*, *Merxmüllera disticha*, *Nenax microphylla*, *Pentzia globosa* and *Tragus koelerioides*. Succulent species include *Corpuscularia lehmannii*, *Euphorbia meloformis*, *E. gorgonis*, *Senecio radicans* and *Trichodiadema bulbosum*. The geological formation underlying

Table Farm is Grahamstown Silcrete that comprises silcrete remnants overlying kaolinized bedrock (Johnson & Le Roux 1994). The soil is consequently very shallow and nutrient poor. The rock types at Kommadagga Farm are made up of the Kommadagga subgroup of the Witteberg group comprising shales, siltstones and subordinate sandstones (Toerien & Hill 1989).

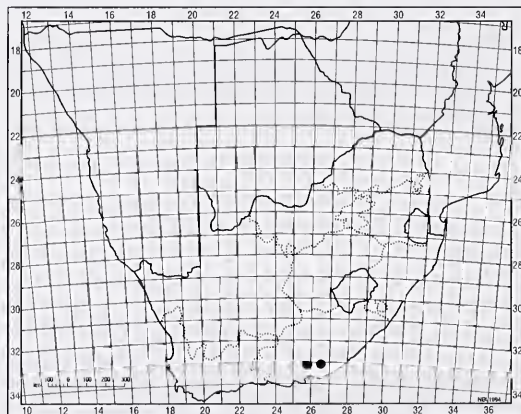


FIGURE 12.—Known distribution of *Ornithogalum perdurans*.

In his description of *Ornithogalum unifolium* (= *O. dyeri*) from Table Farm, Dyer (1930) noted that the species is associated with many other miniature species of specialized growth form, viz., *Eriospermum dregei*, *Schizobasis* cf. *macowanii* and *Bulbine mesembryanthemoides*—in reality an undescribed species (H. Baijnath pers. comm.) referred to as *Bulbine 'inae'* by Vanderplank (1998). Dyer's (1930) observation is supported by the recent discovery of *Brachystelma luteum* (Peckover 1992) and a dwarf variant of *Orthopterum waltoniae* (Hammer 2001) from the same locality. It is suggested that this high succulent species diversity is found on the ecotone between Succulent Thicket in the east and Nama-Karoo in the west and deserves further investigation. Dyer (1930) however, did not collect or record *Ornithogalum perdurans* despite its close proximity to *O. unifolium*, most likely due to its cryptic habit and evident rarity. The IUCN (2000) conservation status category Vulnerable (VU D2) is applied to this species.

Other specimens examined

O. comptonum

EASTERN CAPE.—3325 (Uitenhage): Zwartkops River. (–DC), no date, Ecklon & Zeyher 942 (SAM, isolecto., –PRE, photo.).

O. juncifolium

KWAZULU-NATAL.—2930 (Pietermaritzburg): near Botha's Railway Station, (DC), 4-10-1892, Wood 4774 (PRE, iso.); Fields Hill, (–DD), no date, Wood 1973 (SAM, iso., PRE, iso.); Umzindusi River (precise locality unknown), 1875–1880, Rehmann 7636 (–PRE, photo.).

WESTERN CAPE.—3319 (Tulbagh): precise locality unknown, 1884, Pappé s.n. (SAM, iso., –PRE, photo). 3320 (Montagu): Whitehill Karoo Garden, Laingsburg Dist., (–BA), 01-12-1941, Compton 12629 (BOL, holo.); Whitehill Karoo Garden, Laingsburg Dist., (–BA), 23-10-1943, Leighton 269 (BOL, holo., PRE). 3321 (Ladismith): Langeberg (precise locality unknown), Mossel Bay Division, (–CC, –CD), 04-1914, Muir 1314 (BOL, holo., –PRE, photo). 3323 (Willowmore): headwaters of Wagenbooms River, (–CA), 11-1922, Fourcade 2396 (BOL, holo.). 3418 (Simonstown): Patrysvlei (exact locality not found), 03-02-1941, Salter 8602 (BOL, holo.).

EASTERN CAPE.—3424 (Humansdorp): Witt Els Bosch, (–AA), 11-1920, Fourcade 1011 (BOL, holo.); Kromme River, east of Assegai Bosch, (–BB), no date, Fourcade 3940 (BOL, holo.). 3325 (Port Elizabeth): Port Elizabeth neighbourhood, (–DC), no date, Drège 8674 (G, holo., –PRE, photo.).

Locality unknown

WESTERN CAPE.—Cape of Good Hope, 1820, Bowie 1921/731, (–PRE, icono., photo.).

O. perdurans

EASTERN CAPE.—3326 (Grahamstown): Table Farm, 12 km west of Grahamstown, (–BC), 550 m, 14-07-2001, Dold 4431 (GRA).

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A.P. DOLD* and S.A. HAMMER**

* Selmar Schonland Herbarium, P.O. Box 101, Rhodes University, 6140 Grahamstown, South Africa.

** Sphaeroid Institute, 845 Mason Road, Vista, California 92084, USA. MS. received: 2002-04-10.