



A new species of *Disa* (Orchidaceae) from Mpumalanga, South Africa

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Abstract

A new species, *Disa vigilans* D. McMurtry and T.J. Edwards, is described from the Mpumalanga Escarpment. The species is a member of the *Disa* Section *Stenocarpa* Lindl. Its alliances are discussed in terms of its morphology and its phylogenetic placement is elucidated using molecular data. *D. vigilans* has previously been considered as an anomalous form of *Disa montana* Sond. but is more closely allied to *Disa amoena* H.P. Linder.

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1. Introduction

Disa is the largest genus of Orchidaceae in southern Africa (162 spp.) and has been the focus of considerable taxonomic investigation (Linder, 1981a,b, 1986; Linder and Kurzweil, 1994). The genus is widespread south of the Sahara with a single species extending into the Arabian Peninsula (Linder and Kurzweil, 1999). The species are mostly confined to southern Africa in pyrophytic vegetation of the Cape and eastern highlands (Linder, 1983). This pattern of diversity is reflected in the biogeography of the Disinae in which Linder (1983) recognized 7 centres of endemism and defined 3 refugial regions, the Cape fold mountains, the KwaZulu–Natal–Mpumalanga Escarpment and the African Rift Valley mountains.

Disa vigilans D. McMurtry and T.J. Edwards, sp. nova., similaris *D. montanae* sed minus robusta, foliis angustioribus; inflorescentia pauciflora; flores albi, punctis marroninis; perianthium omne angustius, praesertim sepalum dorsale anguste oblongum non orbiculare, petalis lateralibus brevioribus, 5 mm non 6–9 mm longis, labio oblanceolato, non ovato.

TYPE.—South Africa, Mpumalanga, Lydenburg district, south of Long Tom Pass, Farm Blyfstaanhoogte 209JT, (-BA), McMurtry 12251 (PRE, holo.; NU, iso.). Fig. 1A.

Erect terrestrial herb, 160–280 mm tall. Leaves 7–9, cauline, erect or slightly spreading, rigid, linear-lanceolate, 50–90 × 2–4 mm,

with 3 main veins, margins thickened and translucent. Inflorescence lax, cylindrical, 40–75 mm long; bracts light green suffused pinkish with darker green veins, linear-lanceolate, acuminate, 11–29 × 2–3 mm, scarious at anthesis. Flowers white suffused with carmine-pink and green, blotched and speckled maroon; lateral sepals very pale green to white, blotched maroon, with green median veins, patent, oblanceolate, apiculate, 11–14 × 3.0–3.5 mm; dorsal sepal narrowly galeate, apiculate, margin weakly revolute, 10–14 × 5–7 mm, spur spring-green and blotched maroon, straight, terete, 12–16 × 0.75–1.0 mm, nectariferous; lateral petals translucent white with maroon markings along distal margin, erect, narrowly ovate, ±5 × 3 mm, tapered, apex curved within the galea, 1.5 mm broad, basal anticose lobe small, apex pustulate-erose; lip white, distally maroon blotched, narrowly oblanceolate, slightly decurved, 10–14 × 3 mm. Anther reflexed, 2 mm long, deep blue-maroon basally and spring-green at the apex. Stigma white with a pink margin, 1.5 × 1.0 mm; rostellum as broad as the stigma, flat, lateral lobes short, raised at 45°, central lobe vestigial. Ovary obliquely patent, narrowly oblong, 12–18 × 2–3 mm.

2. Diagnostic characters

This species was initially considered a geographic colour form of *Disa montana* (Linder, pers. com.), a rare high altitude species of the Eastern Cape (Fig. 2) which is allopatric from *D. vigilans* (Fig. 3). *D. montana* (Fig. 1D) differs in its larger

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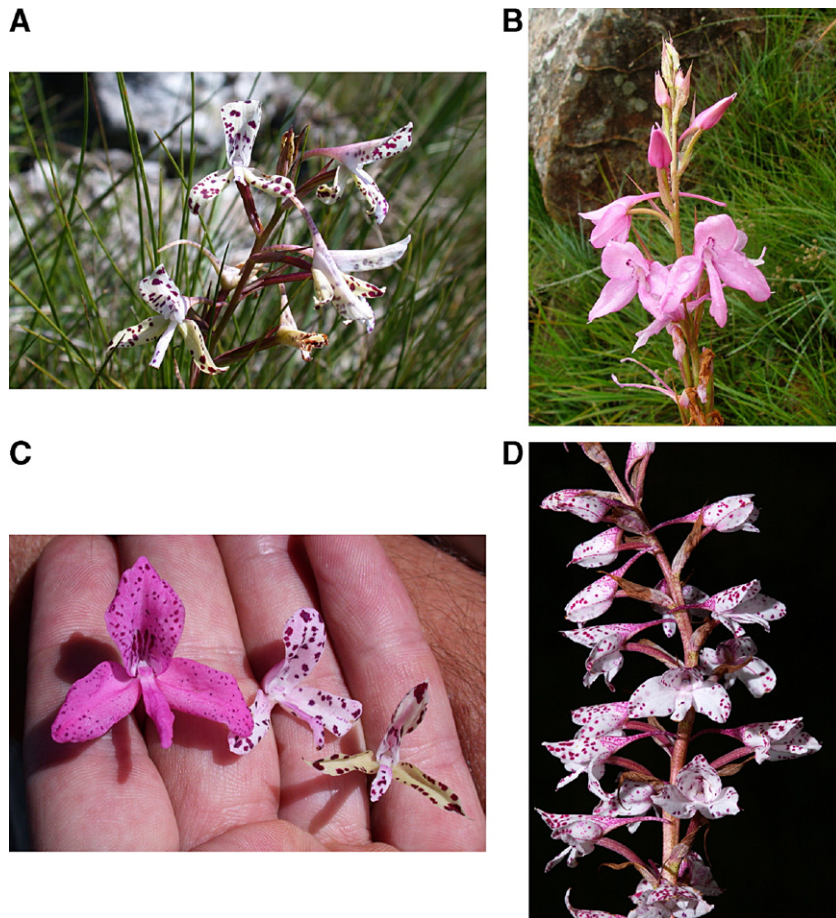


Fig. 1. (A) *D. vigilans*, flowering plant; (B) *D. amoena*, flowering plant; (C) single flower of *D. amoena* (right), a putative hybrid (centre) and *D. vigilans* (left); (D) *D. montana*, flowering plant.

stature, broader leaves (± 6 mm vs 2–4 mm broad), longer ovaries (20–26 mm vs 12–18 mm) and much broader perianth segments, the dorsal sepals in particular. In *D. montana* the dorsal sepals are flattened and usually orbicular, 10–18 \times 9–16 mm, whereas those of *D. vigilans* are oblong, galeate, and 10–14 \times 5–7 mm. The species also differ in the size and shape of the lip. In *D. montana* the lip is ovate-acuminate, oblong or rounded and 10–15 \times 3–5 mm. In *D. vigilans* the lip is oblanceolate, broadest in the distal third, and 10–14 \times 3 mm. In *D. montana* the lateral sepals are broader, 12–17 \times 4.0–6.5 mm. In *D. vigilans* the lateral sepals and droop are obliquely patent and narrow, 11–14 \times 3.0–3.5 mm.

D. vigilans is sympatric with its close ally *Disa amoena* (Fig. 1B). Both are very narrow endemics limited to the Mt. Mauch–Mt. Anderson area, although the latter is locally frequent. *D. amoena* is a larger species 300–600 mm tall with longer leaves and larger inflorescences. The flowers are deep pink in *D. amoena* (Fig. 1B) and all the segments are larger (dorsal sepals 15–20 \times 6–9 mm vs 10–14 \times 4–7 mm; lateral sepals 13–20 \times 6–10 mm vs 11–14 \times 3.0–3.5 mm; lip 15–18 \times 3–4 mm vs 10–14 \times 3 mm). The spur of *D. amoena* is also considerably longer (25–35 mm vs 12–16 mm).

In colour, *D. vigilans* is similar to *D. nivea* of the southern Drakensberg. The pollination of *D. nivea* was recently de-

scribed (Anderson et al., 2005). This nectarless species appears to mimic *Zaluzianskya microsiphon* (Scrophulariaceae) and is pollinated by the long-tongued fly *Prosoeca ganglbaueri* (Nemestrinidae). It is possible that *D. vigilans* relies on a similar system however the spur length is short for pollination by *P. ganglbaueri* despite the remarkable range of tongue lengths recorded in the species (Anderson et al., 2005).

3. Phylogenetic relationships

D. vigilans is a member of the diverse section *Stenocarpa* Lindl., which currently comprises sixteen species (Linder and Kurzweil, 1999). Fifteen of these species are endemic to southern Africa, with only *Disa saxicola* Schltr. extending into South-central and East Africa. (Linder and Kurzweil, 1999). The section is defined by square lateral rostellum lobes, flat or shallowly concave viscidia, tapering horizontal perianth spurs and the absence of sterile vegetative shoots (Linder, 1981a). A molecular phylogenetic analysis (Bytebier et al., in press) based on two chloroplast and one nuclear gene region, and confirmed the classification of *D. vigilans* within section *Stenocarpa*. This analysis included 13 of the 16 members of the section and these resolved as a monophyletic clade sister to sections *Herschelianthe* and *Amphigena*. Rather than being

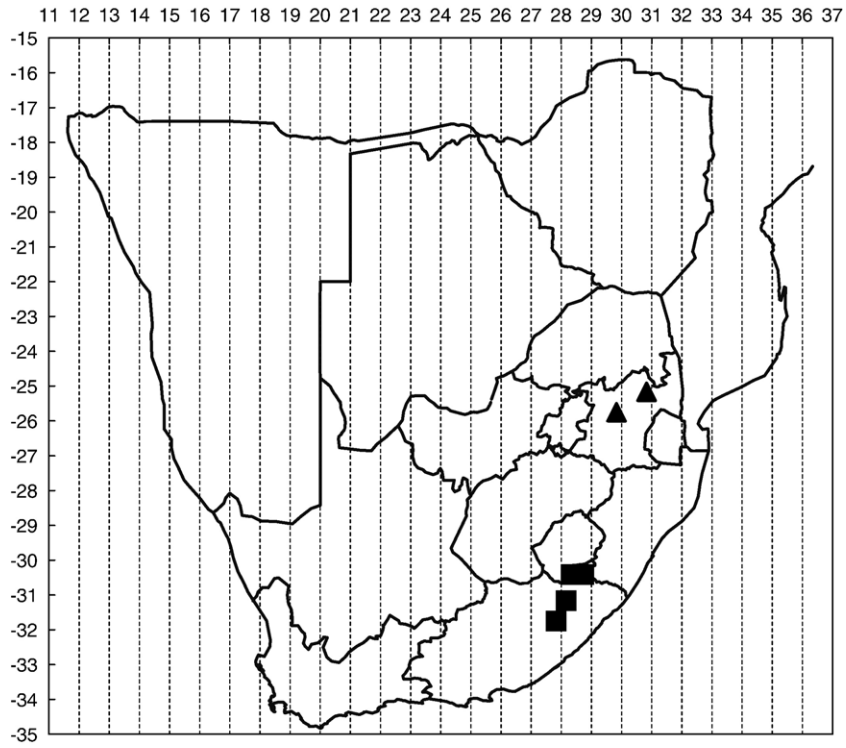


Fig. 2. *D. montana* (■) and *D. amoena* (▲) known distributions.

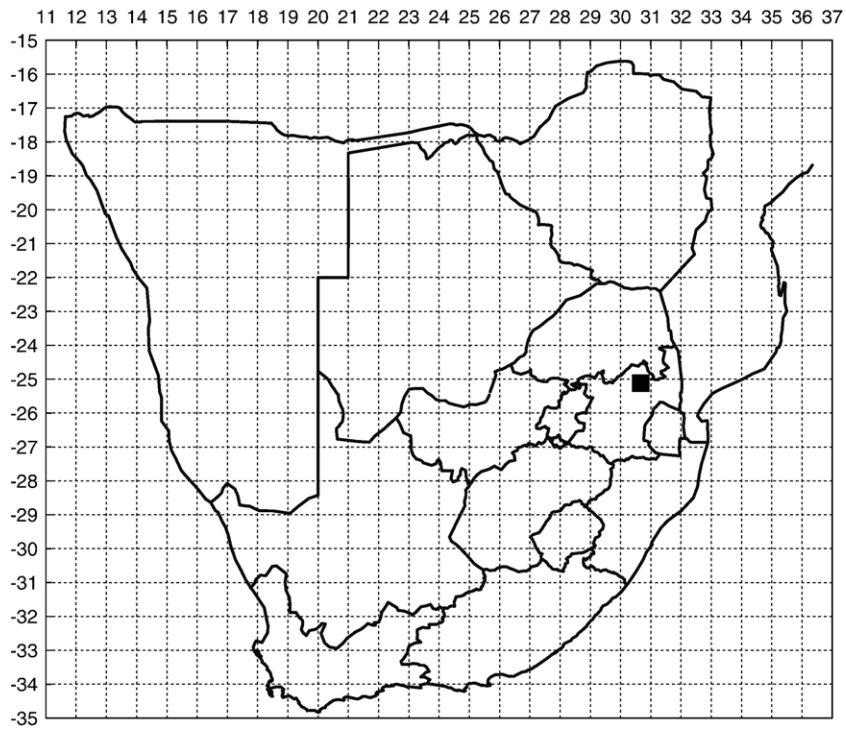


Fig. 3. *D. vigilans* known distribution.

closely related to *D. montana*, *D. vigilans* is retrieved with high bootstrap support as a sister to *D. amoena*, with which it occurs sympatrically (Figs. 2 and 3). A putative hybrid between the two species has been observed (Bellstedt and Lotter, pers. com.) (Fig. 1C).

4. Flowering time

Flowering occurs between December and January.

5. Etymology

The specific epithet alludes to the high vantage point in which the species grows.

6. Habitat

Elizabeth and Dale Parker discovered *D. vigilans* on the edge of the Drakensberg Escarpment in Mpumalanga and brought it to our attention. Only two populations are known and these are separated by about a kilometer, between altitudes of 2100 and 2150 m. The species occurs on the lip of the escarpment, in well-drained North-Eastern Mountain Sourveld between Black Reef Quartzite boulders. The localities are isolated, exposed and windswept. Associated angiosperms include *Berkheya echinacea* (Harv.) O. Hoffm. ex Burt Davy, *Helichrysum opacum* Klatt and *Helichrysum mariepsopicum* Hilliard (Asteraceae), *Erica atherstonei* Diels ex Guthrie and Bolus (Ericaceae), and *Cyphia elata* Harv. (Campanulaceae). The species falls within the Wolkberg Centre of Plant Endemism (Mathews et al., 1993) which is severely threatened by wide scale timber plantations.

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