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The endemic and near-endemic angiosperms of the Drakensberg Alpine Centre

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Abstract

The Drakensberg Alpine Centre (DAC) of southern Africa supports a speciose number of angiosperms. Its compliment of 2520 native angiosperms is comparable with the native floras of northern hemisphere countries such as Germany or Switzerland, and is almost double that of Great Britain. Levels of angiosperm endemism and near-endemism in the DAC too are high, that are here treated within a conservation framework to draw attention to the local and global significance of its biodiversity. The DAC supports some 334 endemic and 595 near-endemic angiosperms, meaning that almost 37% of its flora is confined to a core region south of the Limpopo River. Strict endemism is c. 13%, slightly lower than the 16% endemism for KwaZulu-Natal, and substantially lower than endemism (c. 69%) in the Cape Floristic Region. Most endemic and near-endemic taxa belong to the Asteraceae, Scrophulariaceae and Iridaceae, which are the largest, fourth largest and seventh largest angiosperm families in the DAC respectively. *Helichrysum* and *Senecio* contribute the most endemics and near-endemics. Many of the endemics are rare, and have very specific habitat preferences. Some 42% of the endemic taxa, and 16% of the near-endemic taxa, are Red Data species. Here we add a further 42 endemic taxa (c. 13%) to the Orange List, bringing the total number of endemics that are now either Red or Orange Data listed to 182 (c. 55%); their conservation needs to be prioritised. A strong plea is made for the continued sustainable management and protection of biota in the DAC, and the mitigation of any threats that may lead to their demise.

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1. Introduction

The Drakensberg Alpine Centre (DAC) (CPD Site Af82, WWF and IUCN, 1994) covers some 40,000 km² (Fig. 1) within the greater Drakensberg Range, the latter extending for almost 1000 km along the eastern boundary of the southern African plateau (Partridge and Maud, 1987). Politico-geographically, the DAC is subdivided into four domains (Fig. 1): the KwaZulu-Natal Drakensberg, the Eastern Cape Drakensberg and Witteberge, the Maloti Mts. of Lesotho, and the highlands of the eastern Free State (Carbutt and Edwards, 2004). The DAC is subdivided floristically into the alpine region of the KwaZulu-Natal Drakensberg summit and Lesotho Malotis; its outliers (e.g. Mahwaqa and Ngeli Mts.); the northern KwaZulu-Natal Drakensberg scarp face; the southern KwaZulu-Natal Drakensberg scarp face; the southern Eastern

Cape Drakensberg and Witteberge; and the Sehlabathebe/East Griqualand/Naude's Nek region (Hilliard and Burtt, 1987).

The DAC occurs within White's (1983) archipelago-like centre of endemism, comprising the Afromontane and Afroalpine phytochoria. At a finer scale, White's (1978) classification of the Afromontane archipelago recognised seven regional mountain systems, of which the Drakensberg Range (including the DAC) is the most southern. The DAC is regarded as being the only true alpine region in southern Africa (Linder, 1990), and, in conjunction with the Cape Floristic Region (CFR) (Goldblatt and Manning, 2002; Linder, 2003), has been proposed as the southern (Gondwanan) source of the temperate flora of Africa (Hilliard and Burtt, 1987; Linder, 1990, 1994).

Among the centres of plant endemism recognised by Van Wyk and Smith (2001), the DAC (using Carbutt and Edwards' (2004) estimate of 2618 species of vascular plants) ranks as having the fourth richest regional flora in southern Africa, surpassing even the richness of many of the subtropical and semi-arid floras of southern Africa. Despite its recognition as a

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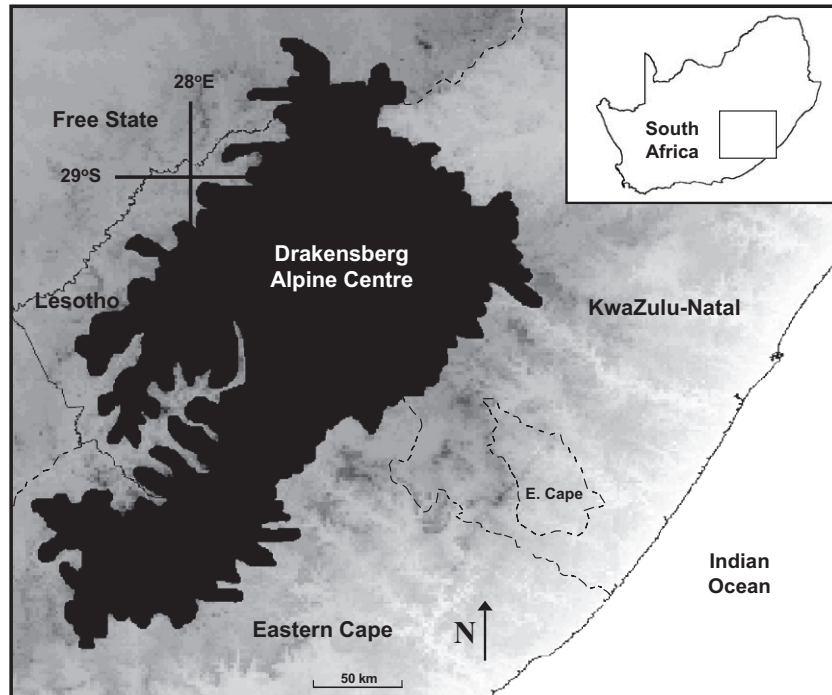


Fig. 1. The Drakensberg Alpine Centre (DAC) comprising eastern Free State, KwaZulu-Natal Drakensberg, Lesotho Maloti Mts. and Eastern Cape Drakensberg/Witteberge.

regional centre of endemism, its endemic plants, and their conservation status, remain poorly known.

Only a small fraction (c. 5.5%) of the DAC is currently conserved (Cowling and Hilton-Taylor, 1994; Killick, 1994). The great majority of this (c. 97%; Killick, 1994) lies within the uKhahlamba-Drakensberg Park (KwaZulu-Natal, South Africa), recently declared a World Heritage site for outstanding biological and cultural attributes (Derwent et al., 2001). This Park, covering 242,813 ha (Porter et al., 1999), is a region of strategic conservation importance and one that contains much (c. 80%) of the DAC's vascular plant diversity. Less than a handful of small parks protect biodiversity in the Lesotho portion of the DAC, namely the Sehlabathebe (proclaimed), Bokong and Ts'ehlanyane National Parks (proclamation pending). Despite the Lesotho Maloti Mts. encompassing much of the DAC, only 3% of the conserved land in the DAC falls within this region (Killick, 1994). The Basuto people of this region are rural herdsman and pastoralists, who follow a subsistence-based form of agriculture. As a result, biodiversity threats to this area include severe overstocking of domestic animals (and therefore overgrazing), large-scale soil erosion, invasive exotic plants and inappropriate cropping practices in an area poorly suited to arable agriculture (Hall et al., 1984; Killick, 1994; Talukdar, 1994; Carbutt and Edwards, 2004). A further threat to plant diversity in the DAC is the Lesotho Highlands Water Project (LHWP), which once (or if) all phases are completed, will inundate more than one-third of Lesotho's total surface area with water. The proposed five large dams (Katse and Mohale Dams completed) are destined to supply water to the highly industrialised Witwatersrand complex in South Africa (Talukdar, 1994). Other threats include afforestation and the subsistence and commercial

harvesting of native plants (Cowling and Hilton-Taylor, 1994, Talukdar, 1994). The implications of improper protection do not bear solely on the DAC's phytodiversity: the DAC also serves as southern Africa's premier water catchment, and is home to a diverse fauna (Porter et al., 1999). It is therefore a region of strategic biological and socio-economic importance and concern, with national and international ramifications.

The aims of this study, therefore, were to accurately document the full quota of endemic and near-endemic angiosperms of the DAC (and not solely for its sub-floras defined by political boundaries as in the past); make comparisons with the endemic angiosperms of other (mostly high-altitude) floras in southern and south-central Africa; scrutinise the number of Red Data (IUCN, 1994) and Orange Data (Victor and Keith, 2004) species in order to assign them conservation priority; draw international attention to a poorly known southern hemisphere temperate flora; and highlight the difficulties and problems associated with such a study.

1.1. History of endemic accounts

Hilliard and Burt (1987) estimated that 394 angiosperm taxa are endemic to the Eastern Mountain Region. This Region, however, extends slightly beyond the DAC, and a number of their 394 taxa are therefore referred to as near-endemic in this account. Hilliard and Burt's (1987) Eastern Mountain Region extended to as low as 1500 m a.s.l. in parts, to include the highlands of the former Transkei (e.g. Baziya, Insikeni, Insizwa and Tabankulu), and the hills as far south as Queenstown. These outliers are not considered part of the DAC, and the DAC and Eastern Mountain Region are therefore only loosely equivalent.

Hilliard and Burt's (1987) estimate of angiosperm endemism for the Eastern Mountain Region (c. 29%) was inflated because the floras of the Lesotho Highlands and Eastern Cape Drakensberg, ill-explored at the time, were never incorporated into their calculation of endemism (Carbutt and Edwards, 2001). A concurrent regional overview of endemism by Van Wyk and Smith (2001) recognised the DAC as one of 18 centres of plant endemism in southern Africa, and estimated the number of endemics in the DAC at >400 taxa, out of a total of c. 2200 taxa (c. 18% endemism). These figures were used by Pooley (2003), whom makes mention of Eastern Mountain Region endemics, rather than DAC endemics, and refers to the two regions as synonymous. Pooley (2003) refers to Eastern Mountain Region endemics as species occurring above the 1500 m contour. A recent study (Carbutt and Edwards, 2004) documented 2520 native angiosperm taxa, and c. 16% endemism. The precise number of endemics, as well as their conservation status, was not investigated.

2. Materials and methods

The following sources were used for the compilation of this inventory: Hilliard and Burt (1987), Van Wyk and Smith (2001), Pooley (1993, 1998, 2003), and Germishuizen and Meyer (2003). The selection of taxa was verified using specific taxon treatments, in combination with specimens lodged in the Bews Herbarium (NU) of the University of KwaZulu-Natal. Certain plant literature was sourced using 'The International Plant Names Index' (IPNI, 2004). Dubious records were omitted. The 1800 m contour limit was used as the delimiting boundary of the DAC, following Hilliard and Burt (1987) and Van Wyk and Smith (2001), thereby including outlying enclaves such as Little Bamboo Mountain (2421 m), Kamberg (2095 m), Mahwaqa Mountain (2083 m) and the Ngele Range (2268 m). Floristic ties between the southern KwaZulu-Natal Drakensberg and these outliers are strong (JE Granger, unpublished data), which further justified their inclusion into the DAC. The 1800 m cut-off was difficult to maintain because the DAC's alpine regions spread to slightly lower elevations at its northern and southernmost limits (≥ 1700 m). The checklist arrangement conforms mostly to the Englerian system followed by Germishuizen and Meyer (2003), with Scrophulariaceae following Hilliard (1994, 1999). Three newly described species of *Hesperantha* were sourced from Goldblatt (2003), and recent changes to *Cliffortia* were updated from Whitehouse (2004). The endemic and near-endemic angiosperms of the DAC are presented as two appendices; both include infraspecific taxa (subspecies and varieties).

Major's (1988) definition of endemism was followed: 'a taxon is endemic if confined to a particular area through historical, ecological or physiological reasons'. A DAC endemic is defined as any taxon restricted to the DAC, occurring ≥ 1800 m a.s.l. Taxa occurring marginally lower (i.e. 1700–1799 m), yet within the uKhahlamba-Drakensberg Park, were included. Taxa occupying similar altitudes immediately beyond the boundaries of the uKhahlamba-Drakensberg Park were regarded as near-endemic.

A near-endemic taxon is one marginally present elsewhere, sometimes in the form of distant satellite populations (Matthews et al., 1993). Admittedly, determining a region's near-endemic flora is, to a measure, a subjective exercise. This study in no way attempted to invoke centres of origin and directions of migration, but aimed rather at recording all taxa that have a definite present-day station in the DAC, and are mostly restricted to the Eastern Region (refer to 'shared distribution ranges'). Documenting the near-endemic flora is important, as it serves as the 'safety net' to accommodate a number of taxa that are almost confined wholly to the DAC. Their outlying stations are seldom within conservation areas (e.g. outliers occurring in Mistbelt grassland in the KwaZulu-Natal Midlands, of which only c. 3.7% remains untransformed, and a meagre 0.3% is formally conserved, Scott-Shaw et al., 1996). A taxon currently near-endemic to the DAC may in the future be rendered strictly endemic, as its outlying stations may be lost from unconserved rangelands. The benefit of including a near-endemic appendix is that it also allows the inclusion of taxa that may be true endemics, but have been excluded from the endemic appendix because outlying records still await taxonomic scrutiny.

The DAC endemics and near-endemics had their conservation status assessed within the framework of the International Union for Conservation of Nature and Natural Resources (IUCN, 1994) criteria, using the treatments of Scott-Shaw (1999), Talukdar (2002) and Victor (2002). The broad categories of 'extinct or threatened', 'at lower risk' and 'data deficient' were used to comply with existing Red Data treatments (see Talukdar, 2002; Victor, 2002). Treatments by Hall et al. (1980) and Hilton-Taylor (1996a, b, 1997), using IUCN criteria that are now outdated, were also consulted. Taxa assessed using the treatments of the latter two authors were listed separately from those mentioned formerly because of the disparity in the criteria used to assign them to their particular Red Data categories. Certain poorly known and rare DAC endemics, previously unlisted, were added to the newly developed Orange List of Victor and Keith (2004). This safety net is a proactive measure towards protecting the species-rich flora of southern Africa (FSA), and will hopefully preclude 'borderline' taxa from future Red Listing (Victor and Keith, 2004).

The endemics of the DAC were compared with the endemics of other (mostly high-altitude) floras in southern and south-central Africa. Their species-area relationships were represented as double-log plots. The near-endemics were represented as a number of 'phytogeographical' groups based on their shared distribution ranges.

2.1. Challenges

A number of taxa (*Alchemilla*, Cyperaceae, *Delosperma*, *Erica*, *Thesium* and *Wahlenbergia*) were difficult to assess due to the paucity of updated or comprehensive botanical revisions. The lack of congruency between botanical accounts often made the placement of taxa difficult. Borderline taxa were omitted.

3. Results and discussion

3.1. Habitat specificity

A number of DAC endemics (47 or c. 14%) are highly localized and are probably holoendemic. Those taxa known from only one or two sites are listed in Table 1. Restricted ranges may be a true reflection of small populations of low abundance; otherwise, they may be the subjects of under-collection.

3.2. Conservation

Scott-Shaw (1999), Talukdar (2002) and Victor (2002) afforded 219 of the taxa (133 endemic; 86 near-endemic) Red Data status following the IUCN's (1994) criteria (Table 2A). Hilton-Taylor's (1996a, b, 1997) accounts, mostly following the earlier IUCN categories (Davis et al., 1986), included a further 15 taxa (7 endemic; 8 near-endemic), not treated by the previous three authors (Table 2B). The analysis of Hall et al. (1980) contributed a single taxon near-endemic to the DAC (Table 2B). In total, therefore, 235 taxa, or c. 25% of all endemics and near-endemics are Red Data listed. Separate

analyses reveal that c. 42% (140) of the endemics and c. 16% (95) of the near-endemics are Red Data listed.

The task of assessing the conservation status of the remaining endemics was a difficult one. Most aspects of their natural history, especially their population biology (estimates of population size, range, evidence of recruitment, breeding systems) and pollination biology are unknown. Here we add a further 42 endemics (c. 13%) to the Orange List (Table 3). A total of 182 endemics (c. 55%) are now either Red or Orange Data listed and their conservation needs to be prioritised. This is five times greater than the percentage of rare and threatened plants in KwaZulu-Natal, and the World (see Scott-Shaw, 1999), adding further support to southern Africa being recognised as having the highest known concentration of threatened plants in the World (Hilton-Taylor, 1996a). A large proportion (30 or c. 70%) of the 42 Orange Listed endemics, however, are protected in the uKhahlamba-Drakensberg Park (Table 3).

3.3. Diversity, endemism and near-endemism

The DAC (\approx Eastern Mountain hot-spot) is recognised as one of southern Africa's eight 'hot-spots' (Cowling and Hilton-

Table 1
Endemic taxa of the DAC recorded only from one or two sites

Taxa recorded from one site		Taxa recorded from two sites	
Taxon	Family	Taxon	Family
<i>Anthoxanthum brevifolium</i> Stapf	Poaceae	<i>Alepidea insculpta</i> Hilliard & B.L. Burt	Apiaceae
<i>Aponogeton ranunculiflorus</i> Jacot Guill. & Marais ^a	Aponogetonaceae	<i>Athanasia grandiceps</i> Hilliard & B.L. Burt	Asteraceae
<i>Brachystelma perditum</i> R.A. Dyer	Apocynaceae	<i>Cephalaria galpiniana</i> Szabó subsp. <i>galpiniana</i>	Dipsacaceae
<i>Carex killickii</i> Nelmes	Cyperaceae	<i>Cyrtanthus erubescens</i> Killick	Amaryllidaceae
<i>Clutia alpina</i> Prain	Euphorbiaceae	<i>Euryops evansii</i> Schltr. subsp. <i>parvus</i> B. Nord.	Asteraceae
<i>Crassula goatlambensis</i> Hargr.	Crassulaceae	<i>Festuca vulpioides</i> Steud.	Poaceae
<i>Diascia lilacina</i> Hilliard & B.L. Burt	Scrophulariaceae	<i>Fuirena tenuis</i> P.L. Forbes	Cyperaceae
<i>Dracosciadium saniculifolium</i> Hilliard & B.L. Burt	Apiaceae	<i>Hesperantha brevistyla</i> Goldblatt	Iridaceae
<i>Drimia saniensis</i> (Hilliard & B.L. Burt) J.C. Manning & Goldblatt	Hyacinthaceae	<i>Jamesbrittenia jurassica</i> (Hilliard & B.L. Burt) Hilliard	Scrophulariaceae
<i>Euryops brevipes</i> B. Nord.	Asteraceae	<i>Jamesbrittenia lesutica</i> Hilliard	Scrophulariaceae
<i>Felicia caespitosa</i> Grau	Asteraceae	<i>Lotononis jacottetii</i> (Schinz) B.-E. van Wyk	Fabaceae
<i>Gladiolus loteniensis</i> Hilliard & B.L. Burt	Iridaceae	<i>Lotononis minor</i> Dummer & Jenn.	Fabaceae
<i>Gnidia singularis</i> Hilliard	Thymelaeaceae	<i>Pentastichis praecox</i> Linder	Poaceae
<i>Helichrysum hypocephalum</i> Hilliard	Asteraceae	<i>Romulea macowanii</i> Baker var. <i>alticola</i> (B.L. Burt) M.P. de Vos	Iridaceae
<i>Indigofera pseudoevansii</i> Hilliard & B.L. Burt	Fabaceae	<i>Selago leptothrix</i> Hilliard	Scrophulariaceae
<i>Isolepis pellocolea</i> B.L. Burt	Cyperaceae	<i>Senecio parentalis</i> Hilliard & B.L. Burt	Asteraceae
<i>Jamesbrittenia beverlyana</i> (Hilliard & B.L. Burt) Hilliard	Scrophulariaceae	<i>Senecio submontanus</i> Hilliard & B.L. Burt	Asteraceae
<i>Kniphofia hirsuta</i> Codd	Asphodelaceae	<i>Trachyandra smalliana</i> Hilliard & B.L. Burt	Asphodelaceae
<i>Nemesia glabriuscula</i> Hilliard & B.L. Burt	Scrophulariaceae		
<i>Protea nubigena</i> Rourke	Proteaceae		
<i>Schoenoxiphium burtii</i> Kukkonen	Cyperaceae		
<i>Schoenoxiphium distinctum</i> Kukkonen	Cyperaceae		
<i>Schoenoxiphium molle</i> Kukkonen	Cyperaceae		
<i>Schoenoxiphium strictum</i> Kukkonen	Cyperaceae		
<i>Senecio cristimontanus</i> Hilliard	Asteraceae		
<i>Wahlenbergia doleritica</i> Hilliard & B.L. Burt	Campanulaceae		
<i>Wurmbea burtii</i> B. Nord.	Colchicaceae		
<i>Wurmbea tenuis</i> (Hook.f.) Baker subsp. <i>australis</i> B. Nord.	Colchicaceae		
<i>Xerophyta longicaulis</i> Hilliard	Velloziaceae		

^a 'Two sites' refers to two separate gatherings from disparate quarter degree grids.

^a A tentative inclusion for the present time owing to a possible gathering from the Bokkeveld Mts. near Nieuwoudtville in the Western Cape (see Goldblatt and Manning, 2000). This also applies to its inclusion in Appendix 1.

Table 2A

Red Data treatments for plant taxa forming part of the flora of southern Africa (FSA), which are either endemic or near-endemic to the Drakensberg Alpine Centre (DAC)

Red Data treatment by Talukdar (2002) and Victor (2002)	Red Data treatment by Scott-Shaw (1999)
‘Extinct or threatened’ (n=24)	
<i>Aloe polyphylla</i> Schönland ex Pillans	<i>Crocoshmia pearsei</i> Oberm.
<i>Aloe pratensis</i> Baker	<i>Protea nubigena</i> Rourke
<i>Aponogeton ranunculiflorus</i> Jacot Guill. & Marais	
<i>Brachystelma alpinum</i> R.A. Dyer	
<i>Carex killickii</i> Nelmes	
<i>Crassula goathambensis</i> Hargr.	
<i>Disa scullyi</i> Bolus	
<i>Drimia saniensis</i> (Hilliard & B.L. Burt) J.C. Manning & Goldblatt	
<i>Ehrharta longigluma</i> C.E. Hubb.	
<i>Euryops brevipes</i> B. Nord.	
<i>Felicia wrightii</i> Hilliard & B.L. Burt	
<i>Gnaphalium griquense</i> Hilliard & B.L. Burt	
<i>Helichrysum alticolum</i> Bolus	
<i>Helichrysum haygarthii</i> Bolus	
<i>Helichrysum nimbicola</i> Hilliard	
<i>Jamesbrittenia beverlyana</i> (Hilliard & B.L. Burt) Hilliard	
<i>Jamesbrittenia lesutica</i> Hilliard	
<i>Macowania conferta</i> (Benth.) E. Phillips	
<i>Macowania deflexa</i> Hilliard & B.L. Burt	
<i>Macowania hamata</i> Hilliard & B.L. Burt	
<i>Thamnocalamus tessellatus</i> (Nees) Soderstr. & R.P. Ellis	
<i>Wahlenbergia tetramera</i> Thulin	
‘At lower risk’ (n=140)	
<i>Aloe aristata</i> Haw.	<i>Asclepias oreophila</i> Nicholas
<i>Athanasia grandiceps</i> Hilliard & B.L. Burt	<i>Aspidonepsis cognata</i> (N.E.Br.) Nicholas & Goyder
<i>Brachystelma perditum</i> R.A. Dyer	<i>Aspidonepsis flava</i> (N.E.Br.) Nicholas & Goyder
<i>Brachystelma petraeum</i> R.A. Dyer	<i>Aspidonepsis reenensis</i> (N.E.Br.) Nicholas & Goyder
<i>Brunsvigia undulata</i> F.M. Leight.	<i>Aster ananthocladus</i> Hilliard & B.L. Burt
<i>Corycium flanaganii</i> (Bolus) Kurzweil & H.P. Linder	<i>Aster confertifolius</i> Hilliard & B.L. Burt
<i>Cyrtanthus epiphyticus</i> J.M. Wood	<i>Berkheya draco</i> Roessler
<i>Disa basatorum</i> Schltr.	<i>Berkheya pannosa</i> Hilliard
<i>Disa cephalotes</i> Rchb.f. subsp. <i>frigida</i> (Schltr.) H.P. Linder	<i>Comborhiza virgata</i> (N.E.Br.) Anderb. & K. Bremer
<i>Disa montana</i> Sond.	<i>Cotula lineariloba</i> (DC.) Hilliard
<i>Disa oreophila</i> Bolus subsp. <i>erecta</i> H.P. Linder	<i>Cotula paludosa</i> Hilliard
<i>Disa pulchra</i> Sond.	<i>Cotula radicalis</i> (Killick & C. Claassen) Hilliard & B.L. Burt
<i>Disa sankeyi</i> Rolfe	<i>Crocoshmia pottsii</i> (Macnab ex Baker) N.E.Br.
<i>Disa thodei</i> Schltr. ex Kraenzl.	<i>Cyrtanthus erubescens</i> Killick
<i>Disa tysonii</i> Bolus	<i>Cyrtanthus falcatus</i> R.A. Dyer
<i>Disperis concinna</i> Schltr.	<i>Diascia anastrepta</i> Hilliard & B.L. Burt
<i>Disperis cooperi</i> Harv.	<i>Diascia austromontana</i> K.E. Steiner
<i>Disperis stenoplectron</i> Rchb.f.	<i>Diascia megathura</i> Hilliard & B.L. Burt
<i>Disperis tysonii</i> Bolus	<i>Diascia purpurea</i> N.E.Br.
<i>Disperis wealei</i> Rchb.f.	<i>Diascia tugelensis</i> Hilliard & B.L. Burt
<i>Eulophia zeyheriana</i> Sond.	<i>Diascia vigilis</i> Hilliard & B.L. Burt
<i>Glumicalyx lesuticus</i> Hilliard & B.L. Burt	<i>Dierama cooperi</i> N.E.Br.
<i>Helichrysum amplexans</i> Hilliard	<i>Dierama tysonii</i> N.E.Br.
<i>Helichrysum longinquum</i> Hilliard	<i>Dracosciadium saniculifolium</i> Hilliard & B.L. Burt
<i>Helichrysum palustre</i> Hilliard	<i>Erica anomala</i> Hilliard & B.L. Burt
<i>Helichrysum sessile</i> DC.	<i>Erica dominans</i> Killick
<i>Huttonaea woodii</i> Schltr.	<i>Erica ebracteata</i> Bolus
<i>Jamesbrittenia jurassica</i> (Hilliard & B.L. Burt) Hilliard	<i>Erica straussiana</i> Gilg
<i>Macowania corymbosa</i> M.D.Hend.	<i>Erica thodei</i> Guthrie & Bolus
<i>Nerine bowdenii</i> Watson	<i>Erica tysonii</i> Bolus var. <i>tysonii</i>
<i>Nerine pancratioides</i> Baker	<i>Fanninia caloglossa</i> Harv.
<i>Neobolusia tysonii</i> (Bolus) Schltr.	<i>Galtonia princeps</i> (Baker) Decne.
<i>Osteospermum attenuatum</i> Hilliard & B.L. Burt	<i>Galtonia regalis</i> Hilliard & B.L. Burt
<i>Othonna burtii</i> B. Nord.	<i>Geranium drakensbergensis</i> Hilliard & B.L. Burt
<i>Rhodohypoxis incompta</i> Hilliard & B.L. Burt	<i>Gladiolus loteniensis</i> Hilliard & B.L. Burt
<i>Rhodohypoxis thodiana</i> (Nel) Hilliard & B.L. Burt	<i>Gladiolus symonsii</i> F. Bolus
<i>Satyrium microrrhynchum</i> Schltr.	<i>Glumicalyx flanaganii</i> (Hiern) Hilliard & B.L. Burt

(continued on next page)

Table 2A (continued)

Red Data treatment by Talukdar (2002) and Victor (2002)	Red Data treatment by Scott-Shaw (1999)
<i>Schizochilus flexuosus</i> Harv. ex Rolfe	<i>Gnidia renniana</i> Hilliard & B.L. Burt
<i>Senecio austromontanus</i> Hilliard	<i>Helichrysum drakensbergense</i> Killick
<i>Senecio saniensis</i> Hilliard & B.L. Burt	<i>Helichrysum evansii</i> Hilliard
<i>Wahlenbergia cuspidata</i> Brehmer	<i>Helichrysum hyphocephalum</i> Hilliard
<i>Zaluzianskya oreophila</i> Hilliard & B.L. Burt	<i>Helichrysum tenax</i> M.D.Hend. var. <i>pallidum</i> Hilliard & B.L. Burt
	<i>Hemizygia cinerea</i> Codd
	<i>Hesperantha alborosea</i> Hilliard & B.L. Burt
	<i>Hesperantha curvula</i> Hilliard & B.L. Burt
	<i>Hesperantha ingeliensis</i> Hilliard & B.L. Burt
	<i>Hesperantha woodii</i> Baker
	<i>Hilliardia zuurbergensis</i> (Oliv.) B. Nord.
	<i>Hoffmannseggia sandersonii</i> (Harv.) Engl.
	<i>Hypoxis ludwigii</i> Baker
	<i>Indigofera evansii</i> Schltr.
	<i>Kniphofia angustifolia</i> (Baker) Codd
	<i>Kniphofia brachystachya</i> (Zahlbr.) Codd
	<i>Kniphofia breviflora</i> Baker
	<i>Kniphofia evansii</i> Baker
	<i>Kniphofia ichopensis</i> Schinz var. <i>aciformis</i> Codd
	<i>Kniphofia ichopensis</i> Schinz var. <i>ichopensis</i>
	<i>Kniphofia northiae</i> Baker
	<i>Lessertia harveyana</i> L. Bolus
	<i>Lessertia ingeliensis</i> M. Balkwill
	<i>Manulea florifera</i> Hilliard & B.L. Burt
	<i>Miraglossum superbum</i> Kupicha
	<i>Moraea hiemalis</i> Goldblatt
	<i>Moraea unibracteata</i> Goldblatt
	<i>Ornithogalum diphyllum</i> Baker
	<i>Ornithogalum septonii</i> Hilliard & B.L. Burt
	<i>Otholobium fumeum</i> C.H. Stirt.
	<i>Pachyacris</i> sp. nov. <i>rhodantha</i> Stewart & Langley
	<i>Pachycarpus campanulatus</i> (Harv.) N.E.Br. var. <i>campanulatus</i>
	<i>Pachycarpus natalensis</i> N.E.Br.
	<i>Passerina drakensbergensis</i> Hilliard & B.L. Burt
	<i>Peucedanum thodei</i> Arnold
	<i>Protea dracomontana</i> Beard
	<i>Protea subvestita</i> N.E.Br.
	<i>Saniella verna</i> Hilliard & B.L. Burt
	<i>Satureja grandibracteata</i> Killick
	<i>Schizochilus bulbinella</i> (Rchb.f.) Bolus
	<i>Schizoglossum elingue</i> N.E.Br. subsp. <i>elingue</i>
	<i>Schizoglossum stenoglossum</i> Schltr. subsp. <i>flavum</i> (N.E.Br.) Kupicha
	<i>Selago monticola</i> J.M. Wood & M.S. Evans
	<i>Selago trinervia</i> E. Mey.
	<i>Senecio basalticus</i> Hilliard
	<i>Senecio brevilorus</i> Hilliard
	<i>Senecio hirsutilobus</i> Hilliard
	<i>Senecio kalingenwae</i> Hilliard & B.L. Burt
	<i>Senecio mauricei</i> Hilliard & B.L. Burt
	<i>Senecio polelensis</i> Hilliard
	<i>Senecio praeteritus</i> Killick
	<i>Senecio thamathuensis</i> Hilliard
	<i>Strobilopsis wrightii</i> Hilliard & B.L. Burt
	<i>Struthiola angustiloba</i> Peterson & Hilliard
	<i>Syncolostemon macranthus</i> (Gürke) M. Ashby
	<i>Thesium decipiens</i> Hilliard & B.L. Burt
	<i>Wahlenbergia pallidiflora</i> Hilliard & B.L. Burt
	<i>Wahlenbergia polytrichifolia</i> Schltr. subsp. <i>dracomontana</i> Hilliard & B.L. Burt
	<i>Xysmalobium tysonianum</i> (Schltr.) N.E.Br.
	<i>Xysmalobium woodii</i> N.E.Br.
	<i>Zaluzianskya chrysops</i> Hilliard & B.L. Burt
'Data deficient' (n=55)	
<i>Agrostis subulifolia</i> Stapf	<i>Berkheya griquana</i> Hilliard & B.L. Burt

Table 2A (continued)

Red Data treatment by Talukdar (2002) and Victor (2002)	Red Data treatment by Scott-Shaw (1999)
<i>Anisodonteia julii</i> (Burch. ex DC.)	<i>Berkheya leucaugeta</i> Hilliard
Bates subsp. <i>prostrata</i> (E. Mey. ex Turcz.) Bates	<i>Craterocapsa insizwae</i> (Zahlbr.) Hilliard & B.L. Burt
<i>Anthoxanthum brevifolium</i> Stapf	<i>Cyphia natalensis</i> E. Phillips
<i>Aristida monticola</i> Henrad	<i>Erica flanaganii</i> Bolus
<i>Asclepias xysmalobioides</i> Hilliard & B.L. Burt	<i>Erica wyliei</i> Bolus
<i>Bromus firmior</i> (Nees) Stapf	<i>Geranium angustipetalum</i> Hilliard & B.L. Burt
<i>Carex monotropa</i> Nemes	<i>Helichrysum album</i> N.E.Br.
<i>Colpodium drakensbergense</i> Hedberg & I. Hedberg	<i>Hemizygia bolusii</i> (N.E.Br.) Codd
<i>Corycium alticola</i> Parkman & Schelpe	<i>Hesperantha pubinervia</i> Hilliard & B.L. Burt
<i>Cynoglossum alticola</i> Hilliard & B.L. Burt	<i>Indigofera pseudoevansii</i> Hilliard & B.L. Burt
<i>Delosperma ashtonii</i> L. Bolus	<i>Lessertia dykei</i> L. Bolus
<i>Delosperma clavipes</i> Lavis	<i>Polygala praticola</i> Chodat
<i>Delosperma nubigenum</i> (Schltr.) L. Bolus	<i>Senecio telmateius</i> Hilliard
<i>Dierama jucundum</i> Hilliard	<i>Schizoglossum quadridens</i> N.E.Br.
<i>Disa galpinii</i> Rolfe	<i>Schizoglossum singulare</i> Kupicha
<i>Disa sanguinea</i> Sond.	<i>Stachys rudatisii</i> Skan
<i>Euryops evansii</i> Schltr. subsp. <i>dendroides</i> B. Nord.	<i>Tetraria</i> sp. nov. (<i>Killick 1596 NU</i>)
<i>Euryops inops</i> B. Nord.	<i>Thesium cordatum</i> A.W. Hill
<i>Festuca dracomontana</i> H.P. Linder	<i>Tulbaghia montana</i> Vosa
<i>Festuca killickii</i> Kenn.-O'Byrne	<i>Xerophyta longicaulis</i> Hilliard
<i>Gnidia singularis</i> Hilliard	
<i>Gymnopenzia bifurcata</i> Benth.	
<i>Hesperantha crocopsis</i> Hilliard & B.L. Burt	
<i>Lessertia thodei</i> L. Bolus	
<i>Merwillia plumbea</i> (Lindl.) Speta	
<i>Merxmullera aureocephala</i> (J.G. Anderson) Conert	
<i>Merxmullera guillarmodiae</i> Conert	
<i>Pentastichis praecox</i> H.P. Linder	
<i>Romulea luteoflora</i> (M.P. de Vos) M.P. de Vos var. <i>sanisensis</i> M.P. de Vos	
<i>Schizoglossum elingue</i> N.E.Br. subsp. <i>purpureum</i> Kupicha	
<i>Schizoglossum montanum</i> R.A. Dyer	
<i>Schoenoxiphium strictum</i> Kukkonen	
<i>Setaria obscura</i> de Wit	
<i>Wahlenbergia doleritica</i> Hilliard & B.L. Burt	

All treatments used the International Union for Conservation of Nature and Natural Resources criteria (IUCN, 1994).

Table 2B

Red Data treatments for plant taxa forming part of the flora of southern Africa (FSA), which are either endemic or near-endemic to the Drakensberg Alpine Centre (DAC)

Red Data treatment by Hilton-Taylor (1996a, b, 1997)	Red Data treatment by Hall et al. (1980)
'Vulnerable' (n=1)	'Uncertain' (n=1)
<i>Kniphofia hirsuta</i> Codd	<i>Cyrtanthus attenuatus</i> R.A. Dyer
'Rare' (n=1)	
<i>Lotononis minor</i> Dummer & Jenn.	
'Not threatened' (n=11)	
<i>Eucomis humilis</i> Baker	
<i>Eucomis schiffii</i> Reyneke	
<i>Galtonia viridiflora</i> I. Verd.	
<i>Gerbera parva</i> N.E.Br.	
<i>Gladiolus flanaganii</i> Baker	
<i>Gladiolus microcarpus</i> G.J. Lewis	
<i>Gladiolus oppositiflorus</i> Herb.	
<i>Kniphofia fibrosa</i> Baker	
<i>Kniphofia thodei</i> Baker	
<i>Rhus krebsiana</i> C. Presl ex Engl.	
<i>Watsonia gladioloides</i> Schltr.	
'Indeterminate' (n=1)	
<i>Pachycarpus stenoglossus</i> (E. Mey.) N.E.Br.	
'Insufficiently known' (n=1)	
<i>Phylica tysonii</i> Pillans var. <i>tysonii</i>	

Hilton-Taylor's (1996a, b, 1997) treatments were mostly based on earlier IUCN criteria (Davis et al., 1986). Criteria used by Hall et al. (1980) were not referenced.

Table 3
Recent additions to Victor and Keith's (2004) Orange List

Taxon	Orange List category	Met criteria	Locality	Habitat requirements	Conservation measures	Major threat(s)	History of threat	Current population trends	Data source(s)
<i>Dicotyledonae</i>									
<i>Apiaceae</i>									
<i>Alepidea insculpta</i> Hilliard & B.L. Burt	Rare (R)	Occurrence <5000 km ² , <5 locations, southern KwaZulu-Natal Drakensberg only	DAC	Short subalpine grassland on high basalt ridges (c. 2200–2600 m)	Protected in UDP	Incorrect fire regime; soil erosion	Future threat	?	Hilliard and Burt (1985)
<i>Asteraceae</i>									
<i>Euryops evansii</i> Schltr. subsp. <i>parvus</i> B. Nord.	Rare (R)	Occurrence <5000 km ² , <5 locations, Giant's Castle and Cathedral Peak only	DAC	Alpine summit only (c. 2700–2900 m)	Protected in UDP	Incorrect fire regime	Future threat	?	Nordenstam (1968); Pooley (2003)
<i>Helichrysum inornatum</i> Hilliard & B.L. Burt	Rare (R)	Occurrence <5000 km ² , <5 locations, Mpendhle, Underberg and Ngeli Mts. only	DAC	Damp or marshy grassland (c. 1800–2100 m)	Protected in UDP and by DWAF	Habitat loss in Mpendhle and Ngeli; overgrazing	Future threat	?	Hilliard (1983)
<i>Helichrysum mollifolium</i> Hilliard	Rare (R)	Occurrence <5000 km ² , <5 locations, KwaZulu-Natal Drakensberg only	DAC	Damp grasslands and forest margins (c. 2100–2450 m)	Protected in UDP	Alien invasives	Current threat	?	Hilliard (1983)
<i>Helichrysum pagophilum</i> M.D. Hend.	Rare (R)	Occurrence <5000 km ² , <5 locations, Cathedral Peak to Garden Castle and Black Mountains (Lesotho) only	DAC	Rock pavements and cliff faces of alpine summit (c. 2750–3400 m)	Protected in UDP	Harvesting for fire wood	Current and future threat	?	Hilliard (1983); Pooley (2003)
<i>Helichrysum paleatum</i> Hilliard	Rare (R)	Occurrence <5000 km ² , <5 locations, southern and central KwaZulu-Natal Drakensberg only	DAC	Short subalpine grassland on stony mountain slopes (c. 1900–2500 m)	Protected in UDP	Incorrect fire regime; soil erosion	Future threat	?	Hilliard (1983)
<i>Helichrysum qathlambanum</i> Hilliard	Rare (R)	Occurrence <5000 km ² , <5 locations, Butha Buthe (Lesotho), Mpendhle and Underberg only; highly disjunct range	DAC	Damp rocky subalpine grassland and scrubby slopes of alpine summit (c. 1800–3000 m)	Protected in UDP	Cropping in Lesotho; habitat loss; trampling by livestock	Current and future threat	?	Hilliard (1983)
<i>Helichrysum tenuifolium</i> Killick	Rare–Sparse (RS)	Occurrence <20,000 km ² , <10 locations, KwaZulu-Natal Drakensberg only	DAC	Rocky gullies, boulder beds, streamsides, subalpine fynbos (>c. 1650 m)	Protected in UDP	Incorrect burning regime; soil erosion	Past, current and future	?	Hilliard (1983)
<i>Imulanthera thodei</i> (Bolus) Källersjö	Rare (R)	Occurrence <5000 km ² , <5 locations, alpine summit of northern Maloti Mts. only (?)	DAC	Rocky slopes, rocky gullies and alpine fynbos, on basalt (c. 2300–3200 m)	?	Harvesting for firewood and fumigation of huts; soil erosion; fire	Past, current and future	?	Pooley (2003)
<i>Pentzia tortuosa</i> (DC.) Fenzl ex Harv.	Rare (R)	Occurrence <5000 km ² , <5 locations, Witteberge Mts. only (?)	DAC	Rock sheets, scrubby subalpine grassland (c. 2100–2600 m)	?	Habitat loss; soil erosion; fire; farming	Current and future	?	Harvey and Sonder (1894); Pooley (2003)
<i>Senecio cristimontanus</i> Hilliard	Rare–Critically (RC)	Occurrence <100 km ² , 1 location, Kamberg Nature Reserve only, central KwaZulu-Natal Drakensberg	DAC	Short dry stony grassland and steep S-facing sandstone ridges of Little 'Berg (c. 1980–2100 m)	Protected in UDP	Infrequent burning; soil erosion	Future	?	Hilliard (1977); Hilliard and Burt (1982)
<i>Senecio parentalis</i> Hilliard & B.L. Burt	Rare (R)	Occurrence <5000 km ² , <5 locations, Garden Castle Nature Reserve and Ngeli Mt. only, southern KwaZulu-Natal Drakensberg	DAC	Grows in damp marshes on Clarens Sandstone (c. 1800–2150 m)	Protected in UDP and by DWAF	Habitat loss in Ngeli (afforestation)	Current and future	?	Hilliard and Burt (1976); Hilliard (1977)

<i>Senecio qathlambanus</i> Hilliard	Rare (R)	Occurrence <5000 km ² , <5 locations, Naude's Nek (E. Cape Drakensberg) to Giant's Castle	DAC	Damp subalpine and alpine grassland, on steep slopes and along watercourses (c. 2300–3100 m)	Protected in UDP	Habitat loss in E. Cape; infrequent burning	Current and future	?	Hilliard and Burt (1975); Hilliard (1977)
<i>Senecio submontanus</i> Hilliard & B.L. Burt	Rare (R)	Occurrence <5000 km ² , <5 locations, Garden Castle and Bushman's Nek only, southern KwaZulu-Natal Drakensberg	DAC	Damp grassland near marshes on Clarens Sandstone (c. 1600–2400 m)	Protected in UDP	Infrequent burning; alien invasives	Past, current and future	?	Hilliard and Burt (1976); Hilliard (1977)
Brassicaceae <i>Heliophila alpina</i> Marais	Rare (R)	Occurrence <5000 km ² , <5 locations, known only from Ben McDhui (E. Cape Drakensberg) to Thabana Ntlenyana (Lesotho Malotis)	DAC	Damp grassy and scree slopes of alpine summit and wet silt patches and turf on summit plateau (c. 2800–3400 m)	Protected in UDP	Habitat loss in E. Cape; trampling by livestock; soil erosion	Current and future	?	Marais (1966); Pooley (2003)
Campanulaceae <i>Wahlenbergia lobulata</i> Brehmer	Rare (R)	Occurrence <5000 km ² , <5 locations, recorded only from Ben McDhui (E. Cape Drakensberg), Sani Pass/Top and Blue Mt. Pass (Lesotho)	DAC	Short sloping subalpine grassland and cracks in basalt pavements on alpine summit (c. 2600–3100 m)	Protected in UDP	Habitat loss in E. Cape; infrequent fire	Current and future	?	Herbarium records (NU)
Dipsacaceae <i>Cephalaria galpiniana</i> Szabó subsp. <i>galpiniana</i>	Rare (R)	Occurrence <5000 km ² , <5 locations, recorded only from the Naude's Nek and Tsatsane environs (E. Cape/Lesotho Drakensberg)	DAC	Short sloping subalpine and alpine grasslands and gravel beds on summit (c. 2400–3000 m)	?	Habitat loss in E. Cape; soil erosion; trampling by livestock	Current and future	?	Herbarium records (NU)
Ericaceae <i>Erica dracomontana</i> E.G.H. Oliv.	Rare–Sparse (RS)	Occurrence <20,000 km ² , <10 locations, known from 7 locations in the northern KwaZulu-Natal Drakensberg, central Malotis and Witteberge (E. Cape)	DAC	Alpine and subalpine grasslands (c. 2100–2500 m)	Protected in UDP	Frequent fires; harvesting for fire wood	Current and future	?	Oliver (1985)
<i>Erica trichoclada</i> Guthrie & Bolus	Rare (R)	Occurrence <5000 km ² , <5 locations, Ngeli Mt. and Liddesdale only	DAC (with outlier)	Rocky grassland (c. 2200 m)	DWAF	Habitat loss; frequent fires	Past, current and future	?	Guthrie and Bolus (1909), herbarium records (NU)
Fabaceae <i>Argyrolobium summomontanum</i> Hilliard & B.L. Burt	Rare (R)	Occurrence <5000 km ² , <5 locations, known only from the northern and central KwaZulu-Natal Drakensberg and northern Lesotho Malotis	DAC	Short alpine turf (c. 2500–3300 m)	Protected in UDP	Cropping and livestock in Lesotho	Current and future	?	Hilliard and Burt (1983)
<i>Lotononis jacottetii</i> (Schinz) B.-E. van Wyk	Rare (R)	Occurrence <5000 km ² , <5 locations, known only from 2 localities in the northern KwaZulu-Natal Drakensberg and southern Lesotho Malotis	DAC	Grassland (c. 1830–2010 m)	Protected in UDP	Habitat loss in Lesotho; frequent fires	Current and future	?	Van Wyk (1991); Germishuizen and Meyer (2003)
Gentianaceae <i>Sebaea pleurostigmata</i> Hilliard & B.L. Burt	Rare (R)	Occurrence <5000 km ² , <5 locations, known only from the northern and southern KwaZulu-Natal Drakensberg	DAC	Alpine and subalpine grassland (c. 2300–2700 m)	Protected in UDP	Infrequent fire	Future	?	Hilliard and Burt (1983)

Table 3 (continued)

Taxon	Orange List category	Met criteria	Locality	Habitat requirements	Conservation measures	Major threat(s)	History of threat	Current population trends	Data source(s)
Rosaceae									
<i>Cliffortia filicauloides</i> Weim.	Rare (R)	Occurrence <5000 km ² , <5 locations, known only from the northern and central KwaZulu-Natal Drakensberg	DAC	Montane and sub-alpine grassland; on wet rocks and damp earth banks along streams; occasionally <i>Widdringtonia</i> fynbos (c. 1800–2300 m)	Protected in UDP	Invasive alien plants; soil/riverbank erosion; incorrect burning regime	Future	?	Whitehouse (2004), herbarium records (NU)
<i>Cliffortia spathulata</i> Weim.	Rare (R)	Occurrence <5000 km ² , <5 locations, northern KwaZulu-Natal Drakensberg only	DAC	Montane and sub-alpine grassland, on Clarens Formation sandstone or basalt, on well-drained soils; full sun (c. 1800–2750 m)	Protected in UDP	Invasive alien plants; soil erosion; incorrect burning regime	Current and future	?	Whitehouse (2004)
Scrophulariaceae									
<i>Diascia lilacina</i> Hilliard & B.L. Burtt	Rare–Critically (RC)	Occurrence <100 km ² , 1 location, known only from the summit of Saalboom Nek Pass, Eastern Cape Drakensberg	DAC	Cliff-dwelling (c. 2100–2200 m)	?	Rockfalls; instability of the pass	Future	?	Hilliard and Burtt (1983, 1984)
<i>Glumicalyx apiculatus</i> (E. Mey.) Hilliard & B.L. Burtt	Rare (R)	Occurrence <5000 km ² , <5 locations, known only from a small portion of the Eastern Cape Drakensberg and Witteberge	DAC	Wet basalt gravel beds and rock sheets in subalpine grasslands (c. 2200–2560 m)	?	Afforestation	Future	?	Hilliard (1994)
<i>Limosella vesiculosa</i> Hilliard & B.L. Burtt	Rare–Sparse (RS)	Occurrence <20,000 km ² , <10 locations, recorded from 7 fairly disjunct localities on the KwaZulu-Natal Drakensberg escarpment, Maloti Mts. and Eastern Cape Drakensberg	DAC	Wet alpine turf and marshy areas near streams and tarns, mostly on summit plateau (c. 2000–3100 m)	Protected in UDP	Trampling by livestock in Lesotho; prolonged drought	Current and future	?	Hilliard and Burtt (1986a); Pooley (2003)
<i>Manulea dregei</i> Hilliard & B.L. Burtt	Rare (R)	Occurrence <5000 km ² , <5 locations, known only from a small portion of the Eastern Cape Drakensberg and Witteberge	DAC	Damp silty basalt gravel beds in alpine and subalpine grasslands (c. 2285–2835 m)	?	Habitat loss in E. Cape; infrequent fire; afforestation	Current and future	?	Hilliard (1994)
<i>Manulea platystigma</i> Hilliard & B.L. Burtt	Rare (R)	Occurrence <5000 km ² , <5 locations, known only from a small portion of Eastern Lesotho	DAC	Silt patches over rock sheets, loose scree and damp alpine turf on summit plateau (c. 2900–3300 m)	?	Trampling by livestock; overgrazing; infrequent burning	Current and future	?	Hilliard (1994); Pooley (2003)
<i>Nemesia glabriuscula</i> Hilliard & B.L. Burtt	Rare–Critically (RC)	Occurrence <100 km ² , 1 location, known only from Garden Castle NR, southern KwaZulu-Natal Drakensberg	DAC	Boulder bed scrub of the Mlambonja River Valley (c. 2060–2180 m)	Protected in UDP	Flooding and erosion; invasive exotic plants	Past, current and future	?	Hilliard and Burtt (1986b)
<i>Selago leptothrix</i> Hilliard	Rare (R)	Occurrence <5000 km ² , <5 locations, known only from a small portion of the Eastern Cape Drakensberg	DAC	Scrubby subalpine grassland (c. 2100–2500 m)	?	Habitat loss in E. Cape; infrequent fire; afforestation	Current and future	?	Hilliard (1999)

<i>Zaluzianskya turritella</i> Hilliard & B.L. Burtt	Rare (R)	Occurrence <5000 km ² , <5 locations, known only from the central and southern KwaZulu-Natal Drakensberg/Lesotho Escarpment	DAC	Gravel and silt beds overlying basalt rock sheets on alpine summit plateau (c. 2940–3300 m)	Protected in UDP	Trampling and overgrazing by livestock	Current and future	?	Hilliard (1994); Pooley (2003)
<i>Monocotyledonae</i>									
Colchicaceae									
<i>Wurmbea burttii</i> B. Nord.	Rare–Critically (RC)	Occurrence <100 km ² , 1 location, known only from the Sani Pass/Sani Top region of the southern KwaZulu-Natal/Lesotho Drakensberg	DAC	Wet silt and gravel patches amongst rocks in alpine and subalpine grassland (c. 2400–2900 m)	Protected in UDP	Trampling by livestock	Current and future	?	Nordenstam (1978)
<i>Wurmbea pusilla</i> E. Phillips	Rare (R)	Occurrence <5000 km ² , <5 locations, recorded from a few sites along the KwaZulu-Natal Drakensberg escarpment and Lesotho Maloti Mts.	DAC	Seasonally flooded turf and marshlands or gravel and silt patches on summit plateau (c. 2870–3050 m)	Protected in UDP	Trampling by livestock	Current and future	?	Nordenstam (1978)
<i>Wurmbea tenuis</i> (Hook. f.) Baker subsp. <i>australis</i> B. Nord.	Rare–Critically (RC)	Occurrence <100 km ² , 1 location, recorded only from the Mont-aux-Sources region of the northern KwaZulu-Natal/Lesotho/ Free State Drakensberg escarpment	DAC	Gravel and silt patches on summit plateau (c. 2900–3000 m)	Protected in UDP and by FSDAE	Trampling by livestock	Current and future	?	Nordenstam (1978)
Cyperaceae									
<i>Fuirena tenuis</i> P.L. Forbes	Rare (R)	Occurrence <5000 km ² , <5 locations, known only from the Eastern Cape Drakensberg and Lesotho Maloti Mts.	DAC	Marshy areas in montane grassland (c. 1800 m)	?	Afforestation; trampling by livestock	Current and future	?	Forbes (1984)
Iridaceae									
<i>Hesperantha</i> <i>altimontana</i> Goldblatt	Rare (R)	Occurrence <5000 km ² , <5 locations, recorded from a few sites along the KwaZulu-Natal Drakensberg escarpment and Lesotho Maloti Mts.	DAC	Open stony ground in alpine and subalpine grassland, often on slopes (c. 2500–3200 m)	Protected in UDP	Infrequent fires	Past, current and future	?	Goldblatt (2003)
<i>Hesperantha brevistyla</i> Goldblatt	Rare (R)	Occurrence <5000 km ² , <5 locations, recorded only from the northern KwaZulu-Natal/Lesotho/Free State Drakensberg escarpment	DAC	Rock pavements and shallow wet ground in alpine and subalpine grassland, often on slopes (c. 2200–3100 m)	Protected in UDP and by FSDAE	Infrequent fires	Past, current and future	?	Goldblatt (2003)
<i>Hesperantha exiliflora</i> Goldblatt	Rare (R)	Occurrence <5000 km ² , <5 locations, recorded only from a few Disjunct localities in the Lesotho Maloti Mts.	DAC	Marshy turf in alpine and subalpine grassland of summit plateau (c. 2500–2900 m)	?	Infrequent fires; trampling by livestock	Past, current and future	?	Goldblatt (2003)
<i>Romulea macowanii</i> Baker var. <i>alticola</i> (B.L. Burtt) M.P. de Vos	Rare (R)	Occurrence <5000 km ² , <5 locations, recorded only from two sites: Ngeli Mt. summit and the Lesotho Maloti Mts. (exact latter locality unknown)	DAC	Alpine grassland (c. 2200 m)	DWAF	Afforestation; trampling by livestock	Current and future	?	De Vos (1972)

(continued on next page)

Table 3 (continued)

Taxon	Orange List category	Met criteria	Locality	Habitat requirements	Conservation measures	Major threat(s)	History of threat	Current population trends	Data source(s)
Orchidaceae									
<i>Disa dracomontana</i> Schelpe ex H.P. Linder	Rare (R)	Occurrence <5000 km ² , <5 locations, northern and central KwaZulu-Natal Drakensberg only	DAC	Steep alpine and subalpine grasslands, often in rocky ground (c. 2100–2900 m)	Protected in UDP	Infrequent burning; orchid collectors	Current and future	?	Linder and Kurzweil (1999)
<i>Disa nivea</i> H.P. Linder	Rare (R)	Occurrence <5000 km ² , 5 locations, recorded only from a few sites along the southern KwaZulu-Natal/Lesotho Drakensberg	DAC	Rocky montane and subalpine grassland, sometimes <i>Protea</i> savanna, mostly on Clarens Sandstone (c. 2250–2500 m)	Protected in UDP	Afforestation; trampling by livestock; orchid collectors	Current and future	?	Linder and Kurzweil (1999), personal observations
Poaceae									
<i>Festuca vulpioides</i> Steud.	Rare (R) to Rare–Critically (RC) (?)	Occurrence <5000 km ² , <5 locations, Eastern Cape Drakensberg only	DAC	Steep montane and subalpine grassland (c. 1800–2000 m)	?	Afforestation	Current and future	?	Gibbs Russell et al. (1990); Germishuizen and Meyer (2003)

All taxa listed beneath are, with the exception of the near-endemic *Erica trichoclada* Guthrie and Bolus, angiosperms endemic to the Drakensberg Alpine Centre (DAC). Abbreviations for conservation bodies: DWAF=Department of Water Affairs and Forestry; FSDAE=Free State Department of Agriculture and Environment; UDP=uKhahlamba-Drakensberg Park (managed by Ezemvelo KZN Wildlife).

Table 4

Synopsis of the endemic and near-endemic angiosperm taxa of the Drakensberg Alpine Centre (DAC)

	Endemic angiosperms						Near-endemic angiosperms					
	Families		Genera		Species		Families		Genera		Species	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Dicotyledons	26	63.4	72	60.5	243	72.8	40	71.4	128	68.1	412	69.2
Monocotyledons	15	36.6	47	39.5	91	27.2	16	28.6	60	31.9	183	30.8
Totals	41	100	119	100	334	100	56	100	188	100	595	100

Taylor, 1994; Cowling and Hilton-Taylor, 1997), viz. bioregions that are characterised by high species richness, high levels of endemism and high levels of man-induced habitat transformation (Myers, 1988). Its complement of 2520 native angiosperms (Carbutt and Edwards, 2004) is comparable with the native floras of Northern Hemisphere countries such as Germany or Switzerland, and is almost double that of Great Britain (Hawksworth and Kalin-Arroyo, 1995). This total is also comparable with the diversity recorded in the centres of the world-renowned Succulent Karoo Region (Gariiep, Little Karoo and Hantam-Roggeveld Centres) (refer to Van Wyk and Smith, 2001).

Some 334 angiosperm taxa (c. 13%) are endemic to the DAC (Table 4 and Appendix 1) and a further 595 taxa (c. 24%) are near-endemic (Table 4 and Appendix 2), most (c. 99%) of which do not extend beyond the Limpopo River. Thus, 37% of the DAC's flora is confined to the Eastern Region of southern Africa.

Species endemism in the DAC (c. 13%) is slightly lower than that for KwaZulu-Natal (c. 16%, Scott-Shaw, 1999), and significantly lower than the CFR (c. 69%, Goldblatt and Manning, 2002) (see Fig. 4 and Table 9). It is, however, misleading to compare a centre of endemism with a wider-ranging floristic region of higher rank. It would have been desirable to isolate the high-altitude flora of the CFR from its lowland flora, and compare this with the DAC. Distinguishing these 'high-altitude' species is problematic when dealing with temperate vegetation in the CFR (P. Linder personal communication), particularly when very little work has focussed on the CFR's high-altitude flora (see Linder et al., 1993).

3.4. Largest families and genera

The 334 endemics belong to 41 families and 119 genera (mean=2.8 species per genus) (Table 4). The 595 near-endemics belong to 56 families and 188 genera (mean=3.2 species per genus) (Table 4). Although the majority of the endemics and near-endemics are dicotyledons (Table 4), this dominance is not as marked as that reported for the FSA (see Germishuizen and Meyer, 2003).

The 13 families, containing 2% or more endemic species each, collectively contribute c. 80% of the endemic species and c. 69% of the genera that have one or more endemic species (Table 5). The three largest families, Asteraceae, Scrophulariaceae and Iridaceae, contribute almost 50% of the endemic species (Table 5). The 14 families, containing 2% or more near-endemic species each, collectively contribute c. 77% of the near-endemic species and c. 62% of the genera that have one or more near-endemic species (Table 6). The five largest families, Asteraceae, Scrophulariaceae, Iridaceae, Orchidaceae and Fabaceae, contribute almost 50% of the near-endemic species (Table 6).

Asteraceae contributes the most species to the flora of the DAC, as well as the most endemics and near-endemics (Fig. 2). Poaceae contributes few endemics and near-endemics, relative to its dominance in the flora (Fig. 2), probably because of its continuity within the Grassland Biome. Scrophulariaceae and Iridaceae contribute a high proportion of endemics and near-endemics relative to their contribution to the flora (Fig. 2). Iridaceae also features prominently as a contributor of edaphic endemics to the Wolkberg Centre of endemism located in the north-eastern Drakensberg Escarpment (Matthews et al., 1993).

Table 5

Ranking of the larger families that contribute 2% or more endemic species to the angiosperm flora of the Drakensberg Alpine Centre, together with the number of genera contributing endemic species

Rank	Family	Endemic species	% endemic	No. of genera	% genera	Species/genus
1	Asteraceae	103	30.8	23	19.3	4.5
2	Scrophulariaceae	37	11.1	10	8.4	3.7
3	Iridaceae	23	6.9	6	5.0	3.8
4	Apocynaceae	13	3.9	4	3.4	3.3
4	Cyperaceae	13	3.9	6	5.0	2.2
5	Ericaceae	12	3.6	1	0.8	12.0
5	Mesembryanthemaceae	12	3.6	1	0.8	12.0
5	Poaceae	12	3.6	9	7.6	1.3
6	Orchidaceae	11	3.3	6	5.0	1.8
7	Fabaceae	8	2.4	4	3.4	2.0
7	Hyacinthaceae	8	2.4	6	5.0	1.3
8	Asphodelaceae	7	2.1	3	2.5	2.3
8	Thymelaeaceae	7	2.1	3	2.5	2.3
		Σ=266	Σ=79.7%	Σ=82	Σ=68.7%	

Table 6
Ranking of the larger families that contribute 2% or more near-endemic (N-E) species to the angiosperm flora of the Drakensberg Alpine Centre, together with the number of genera contributing near-endemic species

Rank	Family	N-E species	% N-E	No. of genera	% genera	Species/genus
1	Asteraceae	135	22.7	29	15.4	4.7
2	Scrophulariaceae	44	7.4	13	6.9	3.4
3	Iridaceae	42	7.1	8	4.3	5.3
4	Orchidaceae	41	6.9	11	5.9	3.7
5	Fabaceae	33	5.5	14	7.4	2.4
6	Apocynaceae	30	5.0	10	5.3	3.0
7	Poaceae	27	4.5	13	6.9	2.1
8	Campanulaceae	18	3.0	2	1.1	9.0
9	Asphodelaceae	17	2.9	3	1.6	5.7
10	Geraniaceae	16	2.7	3	1.6	5.3
11	Amaryllidaceae	14	2.4	3	1.6	4.7
12	Hypoxidaceae	13	2.2	3	1.6	4.3
12	Lamiaceae	13	2.2	4	2.1	3.3
13	Ericaceae	12	2.0	1	0.5	12.0
		$\Sigma=455$	$\Sigma=76.5\%$	$\Sigma=117$	$\Sigma=62.2\%$	

Fabaceae and Orchidaceae contribute substantially more near-endemics than endemics, while Cyperaceae contributes more endemics than near-endemics (Fig. 2). Species/genus ratios in the endemics only twice exceed 10 (Ericaceae and Mesembryanthemaceae), due to the large genera *Erica* and *Delosperma* (Tables 5 and 7), and in the near-endemics only once exceeds 10 (Ericaceae), due to the large genus *Erica* (Tables 6 and 8).

The genera *Helichrysum* and *Senecio* contribute the most species to the flora of the DAC, as well as the most endemics (Fig. 3A) and near-endemics (Table 8). *Helichrysum* is also a significant contributor of endemics to the flora of the Wolkberg Centre of endemism (Matthews et al., 1993). *Delosperma*, *Erica*, *Hesperantha* and *Diascia* also contribute many endemics (Fig. 3B). Exactly half the genera contributing endemic

species occur above the line of best fit; they are truly remarkable in their endemic representation (Fig. 3). Most of these genera are temperate, montane/alpine specialists, characterised by localised seed dispersal, and favour a range of lithophilic habitats (rock outcrops, basalt gravel beds, wet drip faces, or scree banks). Other possible reasons for their high degree of in situ speciation are: interrupted habitats leading to a breakdown in gene flow; intolerance to warm temperatures (altitudinal endemics); and a high capacity to compete with tropical species in cooler environments. Those genera contributing endemic species, occurring below the line of best fit, tend more towards having tropical affinities, or are wider-ranging in southern Africa than those genera contributing endemics above the line of best fit (Fig. 3). The 12 larger genera contributing

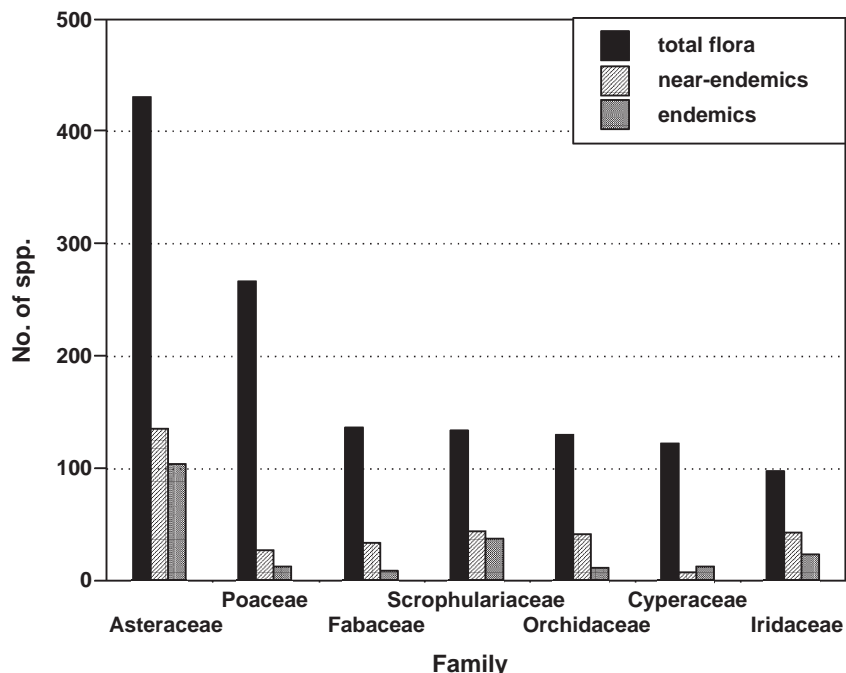


Fig. 2. The larger angiosperm families of the Drakensberg Alpine Centre (DAC), representing their contribution to the angiosperm flora, as well as their contribution of endemics and near-endemics. Flora totals were derived from Carbutt and Edwards (2004).

Table 7
Ranking of the larger genera that contribute six or more endemic species to the angiosperm flora of the Drakensberg Alpine Centre

Rank	Genus	Family	D=dicotyledon/M=monocotyledon	Endemic species	% endemic
1	<i>Helichrysum</i>	Asteraceae	D	29	8.7
2	<i>Senecio</i>	Asteraceae	D	22	6.6
3	<i>Delosperma</i>	Mesembryanthemaceae	D	12	3.6
3	<i>Erica</i>	Ericaceae	D	12	3.6
4	<i>Hesperantha</i>	Iridaceae	M	9	2.7
5	<i>Diascia</i>	Scrophulariaceae	D	8	2.4
6	<i>Euryops</i>	Asteraceae	D	7	2.1
6	<i>Schizoglossum</i>	Apocynaceae	D	7	2.1
7	<i>Disa</i>	Orchidaceae	M	6	1.8
7	<i>Glumicalyx</i>	Scrophulariaceae	D	6	1.8
7	<i>Sebaea</i>	Gentianaceae	D	6	1.8
7	<i>Selago</i>	Scrophulariaceae	D	6	1.8
				Σ=130	Σ=39.0%

six or more endemic species each, collectively account for 39% of the species (Table 7), while a further 12 genera contribute five endemic species each (Appendix 1).

The 29 larger genera contributing six or more near-endemic species each, collectively account for 51% of the species (Table 8), while a further five genera contribute five near-endemic species each (Appendix 2). After *Helichrysum* and *Senecio*, the greatest numbers of near-endemics are contributed by *Wahlenbergia*, *Disa*, *Kniphofia* and *Erica* (Table 8).

Of the 72 genera recognised as Cape elements in the DAC (Carbutt and Edwards, 2001; Carbutt, 2004), 39 (c. 54%)

contribute endemic species and 45 (c. 63%) contribute near-endemic species. Few woody angiosperms, particularly trees, are endemic or near-endemic to the DAC.

Five genera are endemic to the DAC: *Dracomonticola* (Orchidaceae), *Glumicalyx* (Scrophulariaceae), *Heteromma* (Asteraceae), *Polevansia* (Poaceae) and *Strobilopsis* (Scrophulariaceae), and six genera are near-endemic: *Craterocapsa* (Campanulaceae), *Gleklia* (Scrophulariaceae), *Guthriea* (Achariaceae), *Huttonaea* (Orchidaceae), *Rhodohypoxis* (Hypoxidaceae) and *Thamnocalamus* (Poaceae) (Carbutt and Edwards, 2004). There are no endemic families.

Table 8
Ranking of the larger genera that contribute six or more near-endemic (N-E) species to the angiosperm flora of the Drakensberg Alpine Centre

Rank	Genus	Family	D=dicotyledon/M=monocotyledon	N-E species	% N-E
1	<i>Helichrysum</i>	Asteraceae	D	43	7.2
2	<i>Senecio</i>	Asteraceae	D	29	4.9
3	<i>Wahlenbergia</i>	Campanulaceae	D	14	2.4
4	<i>Disa</i>	Orchidaceae	M	13	2.2
4	<i>Kniphofia</i>	Asphodelaceae	M	13	2.2
5	<i>Erica</i>	Ericaceae	D	12	2.0
6	<i>Berkheya</i>	Asteraceae	D	10	1.7
6	<i>Delosperma</i>	Mesembryanthemaceae	D	10	1.7
6	<i>Dierama</i>	Iridaceae	M	10	1.7
6	<i>Lotononis</i>	Fabaceae	D	10	1.7
6	<i>Stachys</i>	Lamiaceae	D	10	1.7
7	<i>Moraea</i>	Iridaceae	M	9	1.5
8	<i>Crassula</i>	Crassulaceae	D	8	1.3
8	<i>Disperis</i>	Orchidaceae	M	8	1.3
8	<i>Hesperantha</i>	Iridaceae	M	8	1.3
8	<i>Pachycarpus</i>	Apocynaceae	D	8	1.3
8	<i>Pentaschistis</i>	Poaceae	M	8	1.3
8	<i>Selago</i>	Scrophulariaceae	D	8	1.3
9	<i>Alepidea</i>	Apiaceae	D	7	1.2
9	<i>Cineraria</i>	Asteraceae	D	7	1.2
9	<i>Cyrtanthus</i>	Amaryllidaceae	M	7	1.2
9	<i>Euryops</i>	Asteraceae	D	7	1.2
9	<i>Hypoxis</i>	Hypoxidaceae	M	7	1.2
9	<i>Pelargonium</i>	Geraniaceae	D	7	1.2
9	<i>Zaluzianskya</i>	Scrophulariaceae	D	7	1.2
10	<i>Cyphia</i>	Lobeliaceae	D	6	1.0
10	<i>Geranium</i>	Geraniaceae	D	6	1.0
10	<i>Rhus</i>	Anacardiaceae	D	6	1.0
10	<i>Schizoglossum</i>	Apocynaceae	D	6	1.0
				Σ=304	Σ=51.1%

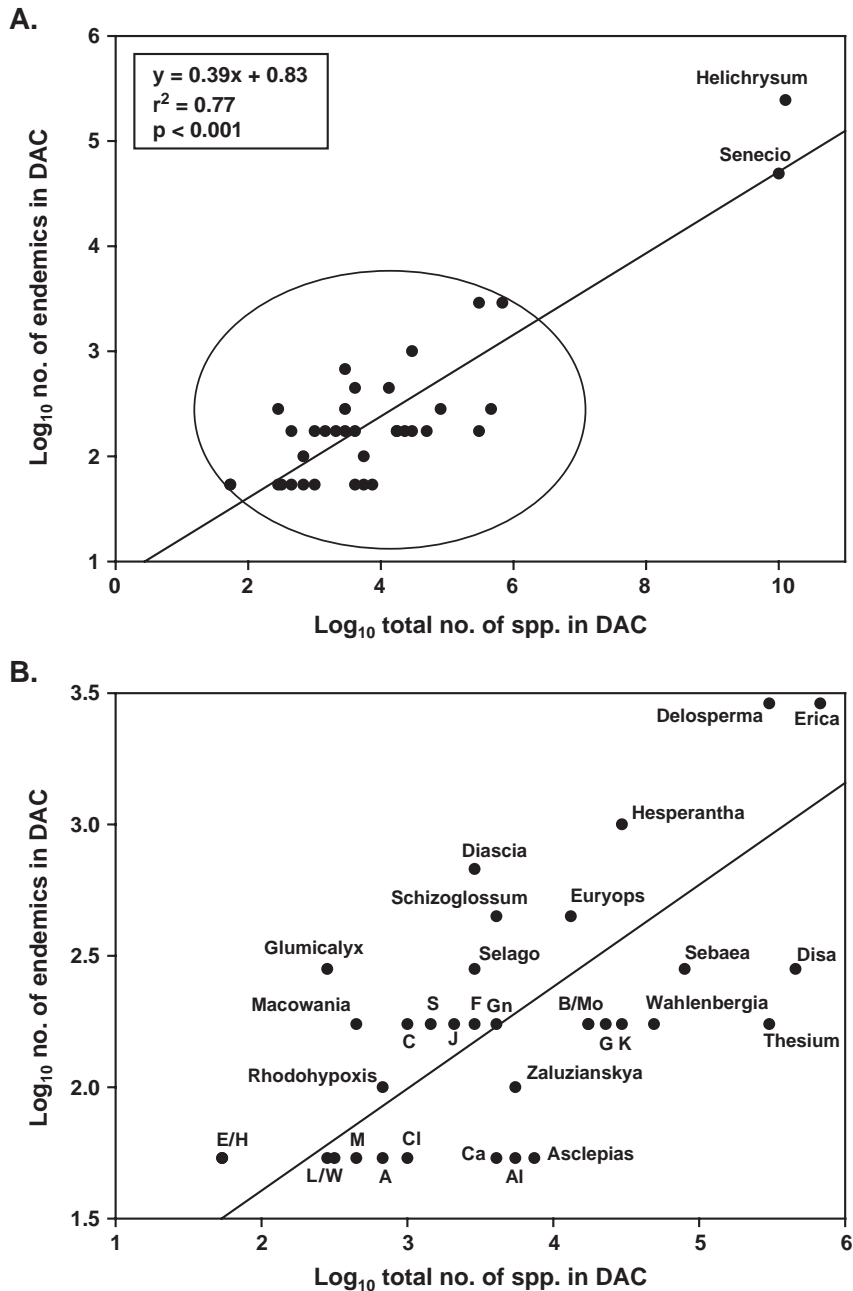


Fig. 3. Double-log plots of the genera contributing three or more species endemic to the Drakensberg Alpine Centre (DAC) relative to their total contribution to the flora. (A) Plotting of all genera that contribute three or more endemic species. (B) Axes scaled down to exclude *Helichrysum* and *Senecio*, in order to view in detail the encircled data pool in panel A. Abbreviations for genera: A=*Aster*; Al=*Alepidea*; B=*Berkheya*; C=*Cotula*; Ca=*Carex*; Cl=*Cliffortia*; E=*Eumorphia*; F=*Felicia*; G=*Gladiolus*; Gn=*Gnidia*; H=*Heteromma*; J=*Jamesbrittenia*; K=*Kniphofia*; L=*Lessertia*; M=*Manulea*; Mo=*Moraea*; S=*Schoenoxiphium*; W=*Wurmbea*.

3.5. Problematic taxa

These can be divided into the following categories:

3.5.1. Poorly known taxa

Several taxa were difficult to place. *Rhynchosia dieterlenae* Baker f. (Fabaceae), for example, is known from one gathering from the Leribe environ in Lesotho (Baker, 1923) (c. 1830 m?). It was excluded because, although meeting the altitudinal requirement, appears to occur just beyond the boundary of the

DAC. *Lessertia glabricaulis* L. Bolus (Fabaceae), apparently recorded from the Lesotho Highlands and a probable DAC endemic, was also excluded for the present time due to insufficient data.

3.5.2. Highly disjunct taxa

Certain taxa, although strictly confined to the DAC in a southern African context, were found to extend further north into tropical Africa, usually in Afromontane environments, following consultation of tropical flora accounts. *Agrocharis*

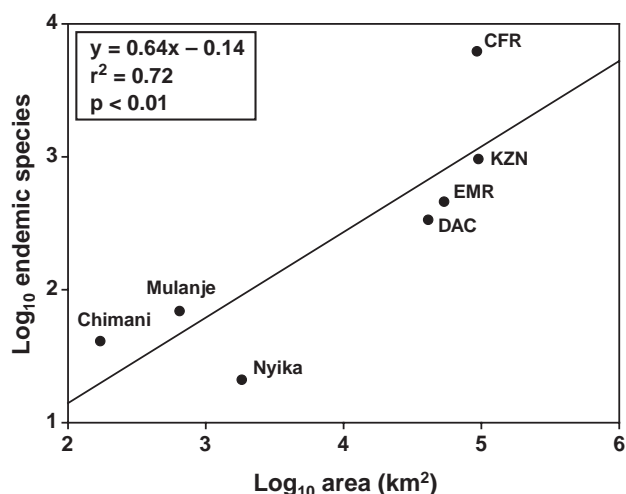


Fig. 4. Double-log plots of the endemic species–area relationships for a number of floras of southern and south-central Africa. ‘Species’ on the y-axis refers to all vascular plant taxa. Abbreviations: CFR=Cape Floristic Region; Chimani=Chimanimani; DAC=Drakensberg Alpine Centre; EMR=Eastern Mountain Region; KZN=KwaZulu-Natal.

melanantha Hochst. (Apiaceae), for example, although confined to the DAC in southern Africa, was first described from the Semien Mts. in Ethiopia, and has also been recorded in Yemen and East Africa (Burt, 1991).

3.5.3. Taxonomically labile taxa

Ischaemum franksae J.M. Wood (Poaceae), described from the DAC in 1908 and thought to be endemic, was sunk 26 years later into *Ischaemum juncifolium* Ballard and Hubbard, from tropical Africa (Clayton, 1978), resulting in the new

combination, *Phacelurus franksae* (J.M. Wood) Clayton. Following this more recent revision, *P. franksae* is not endemic to the DAC. Van Wyk and Smith (2001) erroneously cited this taxon in their endemic/near-endemic list for the DAC.

3.6. Comparison with other floras and the ‘area effect’

A comparison with other high-altitude floras of southern and south-central Africa reveals that endemism in the DAC, when correlated with its geographical area, is sub-average (below the regression line) (Fig. 4). The linear regression represents the expected species–area correlation for a flora relative to its geographical area. The endemics recorded for the Chimanimani Mts. (Zimbabwe) and Mt. Mulanje (Malawi), although relatively few in number (Table 9), are plotted as above-average once geographical area is taken into account (Fig. 4). The position of the DAC plot was at first thought to be skewed by the absence of a large number of near-endemics (c. 125 species) that extend slightly below its 1800 m cut-off. However, the inclusion of the Eastern Mountain Region endemics (this account recognises 459 species occurring ≥ 1500 m), relative to the Eastern Mountain Region’s geographical area of 52,074 km², also resulted in a sub-average plot of endemism (Fig. 4).

At a regional centre-level, endemism in the DAC ranks similarly with centres of endemism in the Succulent Karoo Region (Knervslakte, Little Karoo and Hantam-Roggeveld Centres), and is double the level of endemism recorded for the Pondoland Centre (see Van Wyk and Smith, 2001). The totals supplied by Van Wyk and Smith (2001), however, are slightly inflated due to the inclusion of near-endemics. Such compar-

Table 9

A comparison of the number of endemic vascular plants for regions in southern and south-central Africa

Region	CPD site	Locality	Maximum altitude (m a.s.l.)	No. of vascular species	Vascular species endemism [(no.) %]	Physical area (km ²)	Species/10 ³ km ²	Endemic species/10 ³ km ²
Cape Floristic Region ^a	Af53	Western Cape, South Africa	Matroosberg (2249)	9030	(6204) 68.7	90,000	100.3	68.9
KwaZulu-Natal ^b	–	Eastern Region, South Africa	Njesuthi (3410)	6000	(960) 16.0	92,300	65.0	10.4
Chimanimani Subcentre ^c	Af79	Eastern Highlands, Zimbabwe	Mt. Binga (2440)	859 (≥ 1200 m)	(41) 4.8	171	5023.4	239.8
Nyanga Subcentre ^d	Af80	Eastern Highlands, Zimbabwe	Mt. Inyangani (2593)	? (≥ 2000 m)	?	289	?	?
Chimanimani-Nyanga Centre ^e	–	Eastern Highlands, Zimbabwe	Mt. Inyangani (2593)	>1500 (≥ 1200 m)	(>100) 6.7	?	?	?
Mt. Mulanje ^f	Af64	Southern Malawi	Sapitwa (3001)	1303 (≥ 750 m)	(69) 5.3	640	2036	107.8
Nyika Plateau ^g	Af65	Northern Malawi	Nganda Hill (2607)	± 1900 (≥ 1800 m)	(21) 1.1	1800	1056.0	11.7
DAC ^h (this study)	Af82	Eastern South African interior and Lesotho	Thabana Ntlenyana (3482)	2618 (≥ 1800 m)	(>334) ± 13.0	40,000	65.0	8.4

Regions range from floristic regions, political provinces, centres and subcentres of endemism, to centres of plant diversity.

^a Following Goldblatt and Manning (2002) and Linder (2003).

^b Following Scott-Shaw (1999).

^c Following Goodier and Phipps (1961) and Wild (1964).

^d Following WWF and IUCN (1994).

^e Following Van Wyk and Smith (2001).

^f Following Strugnell (2002).

^g Following Willis et al. (2001).

^h DAC is synonymous with the outdated ‘Drakensberg Alpine Region’ of Killick (1994).

Table 10

Examples of DAC near-endemics grouped according to their similar distribution ranges

Group 1

Dierama dracomontanum Hilliard
Hermannia oligosperma K. Schum.
Hesperantha grandiflora G.J. Lewis
Jamesbrittenia pristisepala (Hiem) Hilliard
Setaria obscura de Wit

Group 2

Aristea montana Baker
Asparagus microraphis (Kunth) Baker
Disperis renibractea Schltr.
Disperis stenoplectron Rchb.f.
Eriocaulon hydrophilum Markötter
Helichrysum monticola Hilliard
Helichrysum oreophilum Klatt
Neobolusia tysonii (Bolus) Schltr.
Plectranthus grillatus Briq.
Rhus montana Diels

Group 3

Adhatoda andromeda (Lindau) C.B. Clarke
Anemone fanninii Harv. ex Mast.
Berkheya macrocephala J.M. Wood
Cineraria dieterlenii E. Phillips
Dierama latifolium N.E.Br.
Helichrysum natalitium DC.
Hoffmannseggia sandersonii (Harv.) Engl.
Hypoxis lata Nel
Indigofera foliosa E. Mey.
Inulathera leucoclada (DC.) Källersjö
Moraea hiemalis Goldblatt
Nemesia silvatica Hilliard
Pelargonium bowkeri Harv.
Schizoglossum flavum Schltr.
Senecio heliopsis Hilliard & B.L. Burt
Tulbaghia natalensis Baker

Group 4

Asparagus concinnus (Baker) Kies
Empodium elongatum (Nel) B.L. Burt
Helichrysum dasycephalum O. Hoffm.
Helichrysum melanacme DC.
Rhus divaricata Eckl. & Zeyh.
Stachys hyssopoides Burch. ex Benth.

Group 5

Crassula tenuicaulis Schönland
Craterocapsa tarsodes Hilliard & B.L. Burt
Dierama pauciflorum N.E.Br.
Disperis concinna Schltr.
Protea dracomontana Beard
Wurmbea angustifolia B. Nord.

The extent of each group's range is outlined in the text.

isions are also somewhat artificial as they fail to take geographical area into account.

3.7. Shared distribution ranges

In general terms, the near-endemic taxa of the DAC can be assigned to five groups, with the taxa of each group displaying similar distribution ranges (Table 10 and Fig. 5). It is important

to note that these shared ranges of distribution are not as yet referred to as phytogeographical groups, as their phylogenetic histories are unknown and have therefore not been incorporated into the analysis. Taxa in Group 1 extend just beyond the DAC, usually not beyond the KwaZulu-Natal Midlands (≥ 1400 m). Taxa in Group 2 have a montane distribution, following the Drakensberg Range to the north and south of the DAC. Their southern-most station is the Amatole Mts., more rarely the Sneeuberge Range near Graaff-Reinet. Their northern-most station is the Mpumalanga Drakensberg (i.e. Graskop, Mariepiskop, Wolkberg, Woodbush), more rarely the Soutpansberg. Their lower altitudinal limits rarely extend below 1200 m. Taxa in Group 3 have a station in the DAC (mostly the KwaZulu-Natal Drakensberg, more rarely the Eastern Cape Drakensberg), with 'outliers' confined almost exclusively to KwaZulu-Natal (KZN), more rarely the Eastern Cape. These 'KZN' (\approx Eastern Region) endemics may extend towards the coast, however their confinement to KZN, with a stronghold in the DAC, renders them near-endemic to the DAC. Taxa in Group 4 occur mostly on the Lesotho Plateau, the uplands of northern KwaZulu-Natal, Free State and the Transvaal Highveld (Mpumalanga and Gauteng), and the northeastern Cape interior. They seemingly have more xeric preferences. None of the taxa in the above groups extend beyond the Limpopo River; moreover they are mostly restricted to the Eastern Region. Taxa in Group 5 have outliers in the Eastern Highlands

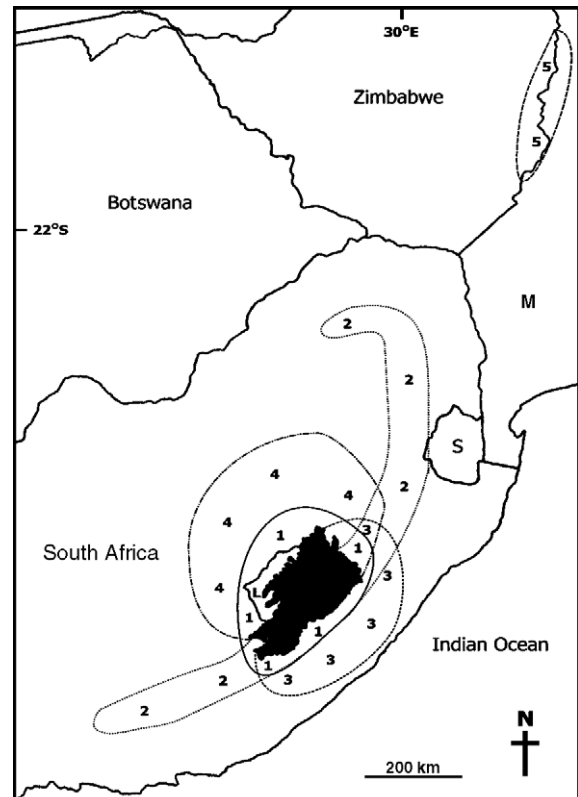


Fig. 5. The shared distribution ranges of five groups of angiosperms near-endemic to the Drakensberg Alpine Centre (DAC): 1='almost endemic'; 2=montane; 3=KwaZulu-Natal endemics; 4=semi-arid interior; 5=eastern highlands of Zimbabwe. Abbreviations: L=Lesotho; M=Mozambique; S=Swaziland. The DAC is depicted as the area shaded in black.

of Zimbabwe, i.e. the Chimanimani-Nyanga Centre of Van Wyk and Smith (2001).

All the above groups were arrived at by inspection of the individual ranges of their constituent taxa. These five groups differ somewhat from the 13 groups identified by Hilliard and Burt (1987) for the flora of the southern KwaZulu-Natal Drakensberg, as the latter analysis included a number of wide-ranging species, and the former only the near-endemics of the DAC. Groups 1 to 6 of Hilliard and Burt (1987), however, dealing with the less wide-ranging species, do comply with roughly the five groups identified in this analysis.

4. Conclusions

The DAC is here shown to have a 13% endemic element, and at least a 24% near-endemic element; the latter being termed the ‘Eastern Region’ element in a southern African context. The many endemics and near-endemics recognised in this account support the World Heritage Convention’s enrolment of part of the DAC as a ‘World Heritage’ site. This profile of angiosperm endemism and near-endemism needs to be followed up by detailed autecological studies of individual species, knowledge of which should help fine-tune management practises (e.g. burning regime) that aim to optimise biodiversity.

Detailed phylogeographic studies of the DAC’s near-endemic taxa will provide further clues into its origins and connections with other floras. The outcome will be a sound breakdown of its phylogeographic elements as undertaken by Hedberg (1961, 1965) for the Afroalpine flora of north-east Africa.

The flora of the DAC must continue to receive conservation attention because many of its taxa are rare and highly restricted in distribution, and more than half of its endemics are regarded as either Red or Orange Data species. This statistic far exceeds the percentage of rare and threatened taxa recorded for many other floras, both local and abroad. Many of the DAC’s endemics are afforded formal protection only in the uKhahlamba-Drakensberg Park (KwaZulu-Natal) and in the Bokong, Ts’ehlanyane and Sehlabathebe National Parks (Lesotho). A strong plea is made for the continued sustainable management and protection of biota in the DAC, as well as the evolutionary processes that have led to their speciation, in order to mitigate any threats that may lead to their demise.

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Appendix A

The endemic angiosperms of the Drakensberg Alpine Centre

Angiospermae–Dicotyledonae

Apiaceae (3/5)

Alepidea insculpta Hilliard & B.L. Burt

Alepidea pusilla Weim.

Alepidea thodei Dummer

Conium fontanum Hilliard & B.L. Burt var. *alticola* Hilliard & B.L. Burt

Dracosciadium saniculifolium Hilliard & B.L. Burt

Apocynaceae (4/13)

Asclepias humilis (E. Mey.) Schltr.

Asclepias oreophila Nicholas

Asclepias xysmalobioides Hilliard & B.L. Burt, not of S. Moore

Brachystelma alpinum R.A. Dyer

Brachystelma perditum R.A. Dyer

Miraglossum superbum Kupicha

Schizoglossum elingue N.E.Br. subsp. *elingue*

Schizoglossum elingue N.E.Br. subsp. *purpureum* Kupicha

Schizoglossum hilliardiae Kupicha

Schizoglossum montanum R.A. Dyer

Schizoglossum quadridens N.E.Br.

Schizoglossum singulare Kupicha

Schizoglossum stenoglossum Schltr. subsp. *flavum* (N.E.Br.) Kupicha

Asteraceae (23/103)

Aster ananthocladus Hilliard & B.L. Burt

Aster confertifolius Hilliard & B.L. Burt

Aster erucifolius (Thell.) Lippert

Athanasia grandiceps Hilliard & B.L. Burt

Berkheya cirsiifolia (DC.) Roessler

Berkheya draco Roessler

Berkheya leucaugeta Hilliard

Berkheya pannosa Hilliard

Berkheya rosulata Roessler

Cineraria albomontana Hilliard

Comborhiza virgata (N.E.Br.) Anderb. & K. Bremer

Cotula lineariloba (DC.) Hilliard

Cotula membranifolia Hilliard

Cotula paludosa Hilliard

Cotula radicalis (Killick & C. Claassen) Hilliard & B.L. Burt

Cotula socialis Hilliard

Eumorphia prostrata Bolus

Eumorphia sericea J.M. Wood & M.S. Evans subsp. *robustior* Hilliard & B.L. Burt

Eumorphia sericea J.M. Wood & M.S. Evans subsp. *sericea*

Euryops acraeus M.D. Hend.

Euryops brevipes B. Nord.

Euryops decumbens B. Nord.

Euryops evansii Schltr. subsp. *dendroides* B. Nord.

Euryops evansii Schltr. subsp. *parvus* B. Nord.

Euryops inops B. Nord.

Euryops montanus Schltr.

Felicia caespitosa Grau

Felicia drakensbergensis J.M. Wood & M.S. Evans

Felicia linearis N.E.Br.

Felicia uliginosa (J.M. Wood & M.S. Evans) Grau

Felicia wrightii Hilliard & B.L. Burt

Garuleum sp. nov.

Gerbera parva N.E.Br.

Gnaphalium limicola Hilliard

Helichrysum album N.E.Br.

Helichrysum amplexens Hilliard

Helichrysum basalticum Hilliard

Helichrysum bellum Hilliard

Helichrysum confertum N.E.Br.

Helichrysum drakensbergense Killick

Helichrysum evansii Hilliard

- Helichrysum flanaganii* Bolus
Helichrysum glaciale Hilliard
Helichrysum haygarthii Bolus
Helichrysum heterolasium Hilliard
Helichrysum hyphocephalum Hilliard
Helichrysum inornatum Hilliard & B.L. Burt
Helichrysum lineatum Bolus
Helichrysum longinquum Hilliard
Helichrysum marginatum DC.
Helichrysum milfordiae Killick
Helichrysum mollifolium Hilliard
Helichrysum nimbicola Hilliard
Helichrysum pagophilum M.D. Hend.
Helichrysum paleatum Hilliard
Helichrysum palustre Hilliard
Helichrysum praecurrens Hilliard
Helichrysum qathlambanum Hilliard
Helichrysum retortoides N.E.Br.
Helichrysum sessilioides Hilliard
Helichrysum subfalcatum Hilliard
Helichrysum tenuifolium Killick
Helichrysum witbergense Bolus
Heteromma decurrens (DC.) O. Hoffm.
Heteromma krookii (O. Hoffm. & Muschl.) Hilliard & B.L. Burt
Heteromma simplicifolium J.M. Wood & M.S. Evans
Inulanthera thodei (Bolus) Källersjö
Macowania corymbosa M.D. Hend.
Macowania deflexa Hilliard & B.L. Burt
Macowania glandulosa N.E.Br.
Macowania hamata Hilliard & B.L. Burt
Macowania sororis Compton
Osteospermum attenuatum Hilliard & B.L. Burt
Osteospermum thodei Markötter
Othonna burttii B. Nord.
Othonna sp. nov.
Pentzia tortuosa (DC.) Fenzl ex Harv.
Printzia nutans (Bolus) Leins
Relhania acerosa (DC.) K. Bremer
Relhania dieterlenii (E. Phillips) K. Bremer
Senecio austromontanus Hilliard
Senecio basalticus Hilliard
Senecio breviflorus Hilliard
Senecio caloneotes Hilliard
Senecio cristimontanus Hilliard
Senecio cryptolanatus Killick
Senecio dissimulans Hilliard
Senecio ingeliensis Hilliard
Senecio kalingenwae Hilliard & B.L. Burt
Senecio marginalis Hilliard
Senecio mauricei Hilliard & B.L. Burt
Senecio monticola DC.
Senecio parascitus Hilliard
Senecio parentalis Hilliard & B.L. Burt
Senecio polelensis Hilliard
Senecio qathlambanus Hilliard
Senecio saniensis Hilliard & B.L. Burt
Senecio seminivens J.M. Wood & M.S. Evans
Senecio submontanus Hilliard & B.L. Burt
Senecio telmateius Hilliard
Senecio thamathuensis Hilliard
Senecio tugelensis J.M. Wood & M.S. Evans
Vernonia flanaganii (E. Phillips) Hilliard
- Boraginaceae (1/1)**
Cynoglossum alticola Hilliard & B.L. Burt
- Brassicaceae (2/3)**
Heliophila alpina Marais
Heliophila formosa Hilliard & B.L. Burt
Lepidium basuticum Marais
- Campanulaceae (1/5)**
Wahlenbergia doleritica Hilliard & B.L. Burt
Wahlenbergia lobulata Brehmer
Wahlenbergia polytrichifolia Schltr. subsp. *dracomontana* Hilliard & B.L. Burt
Wahlenbergia pulvillus-gigantis Hilliard & B.L. Burt
Wahlenbergia tetramera Thulin
- Crassulaceae (1/1)**
Crassula qoathlambensis Hargr.
- Dipsacaceae (1/2)**
Cephalaria galpiniana Szabó subsp. *galpiniana*
Cephalaria galpiniana Szabó subsp. *simplicior* B.L. Burt
- Ericaceae (1/12)**
Erica aestiva Markötter var. *aestiva*
Erica albospicata Hilliard & B.L. Burt (25)
Erica anomala Hilliard & B.L. Burt (25)
Erica dissimulans Hilliard & B.L. Burt (25)
Erica dominans Killick (6)
Erica dracomontana E.G.H. Oliv.
Erica ebracteata Bolus
Erica flanaganii Bolus
Erica frigida Bolus
Erica thodei Guthrie & Bolus
Erica tysonii Bolus var. *tysonii*
Erica wyliei Bolus
- Euphorbiaceae (1/2)**
Clutia alpina Prain
Clutia nana Prain
- Fabaceae (4/8)**
Argyrolobium summomontanum Hilliard & B.L. Burt
Indigofera evansii Schltr.
Indigofera pseudoevansii Hilliard & B.L. Burt
Lessertia dykei L. Bolus
Lessertia harveyana L. Bolus
Lessertia ingeliensis M. Balkwill
Lotononis jacottetii (Schinz) B.-E. van Wyk
Lotononis minor Dummer & Jenn.
- Gentianaceae (1/6)**
Sebaea marlothii Gilg
Sebaea minutissima Hilliard & B.L. Burt
Sebaea pleurostigmata Hilliard & B.L. Burt
Sebaea radiata Hilliard & B.L. Burt
Sebaea spathulata (E. Mey.) Steud.
Sebaea thodeana Gilg
- Geraniaceae (1/2)**
Geranium angustipetalum Hilliard & B.L. Burt
Geranium drakensbergensis Hilliard & B.L. Burt
- Lamiaceae (4/6)**
Hemizygia bolusii (N.E.Br.) Codd
Hemizygia cinerea Codd
Satureja compacta Killick
Satureja grandibracteata Killick
Stachys albiflora N.E.Br.
Syncolostemon macranthus (Gürke) M. Ashby
- Lobeliaceae (1/1)**
Lobelia galpinii Schltr.
- Mesembryanthemaceae (1/12)**
Delosperma alticola L. Bolus
Delosperma basuticum L. Bolus
Delosperma congestum L. Bolus
Delosperma deleeuwiae Lavis
Delosperma galpinii L. Bolus
Delosperma kofleri Lavis
Delosperma nelii L. Bolus
Delosperma nubigenum (Schltr.) L. Bolus
Delosperma pilosulum L. Bolus
Delosperma reynoldsii Lavis
Delosperma scabripes L. Bolus

- Delosperma wiumii* Lavis
- Molluginaceae (1/2)
- Psammotropha alternifolia* Killick
- Psammotropha obtusa* Adamson
- Proteaceae (1/1)
- Protea nubigena* Rourke
- Rhamnaceae (1/1)
- Phyllica thodei* E. Phillips
- Rosaceae (2/5)
- Alchemilla colura* Hilliard
- Alchemilla galpinii* Hauman & Balle
- Cliffortia dracomontana* C.M. Whitehouse
- Cliffortia filicauloides* Weim.
- Cliffortia spatulata* Weim.
- Rubiaceae (1/1)
- Anthospermum basuticum* Puff
- Santalaceae (1/5)
- Thesium alatum* Hilliard & B.L. Burtt
- Thesium congestum* R.A. Dyer
- Thesium cordatum* A.W. Hill
- Thesium decipiens* Hilliard & B.L. Burtt
- Thesium durum* Hilliard & B.L. Burtt
- Scrophulariaceae (10/37)
- Diascia anastrepta* Hilliard & B.L. Burtt
- Diascia austromontana* K.E. Steiner
- Diascia barberae* Hook.f.
- Diascia fetcaniensis* Hilliard & B.L. Burtt
- Diascia lilacina* Hilliard & B.L. Burtt
- Diascia megathura* Hilliard & B.L. Burtt
- Diascia tugelensis* Hilliard & B.L. Burtt
- Diascia vigilis* Hilliard & B.L. Burtt
- Glumicalyx apiculatus* (E. Mey.) Hilliard & B.L. Burtt
- Glumicalyx flanaganii* (Hiern) Hilliard & B.L. Burtt
- Glumicalyx goseloides* (Diels) Hilliard & B.L. Burtt
- Glumicalyx lesuticus* Hilliard & B.L. Burtt
- Glumicalyx montanus* Hiern
- Glumicalyx nutans* (Rolfe) Hilliard & B.L. Burtt
- Harveya leucopharynx* Hilliard & B.L. Burtt
- Harveya pulchra* Hilliard & B.L. Burtt
- Jamesbrittenia asplenifolia* Hilliard
- Jamesbrittenia beverlyana* (Hilliard & B.L. Burtt) Hilliard
- Jamesbrittenia dentatisepala* (Overkott) Hilliard
- Jamesbrittenia jurassica* (Hilliard & B.L. Burtt) Hilliard
- Jamesbrittenia lesutica* Hilliard
- Limosella vesiculosa* Hilliard & B.L. Burtt
- Manulea crassifolia* Benth. subsp. *thodeana* (Diels) Hilliard
- Manulea dregei* Hilliard & B.L. Burtt
- Manulea platystigma* Hilliard & B.L. Burtt
- Nemesia glabriuscula* Hilliard & B.L. Burtt
- Selago flanaganii* Rolfe
- Selago innata* Markötter
- Selago leptothrix* Hilliard
- Selago melliodora* Hilliard
- Selago trauseldii* Killick
- Selago witbergensis* E. Mey.
- Strobilopsis wrightii* Hilliard & B.L. Burtt
- Zaluzianskya chrysops* Hilliard & B.L. Burtt
- Zaluzianskya oreophila* Hilliard & B.L. Burtt
- Zaluzianskya rubrostellata* Hilliard & B.L. Burtt
- Zaluzianskya turritella* Hilliard & B.L. Burtt
- Sterculiaceae (1/1)
- Hermannia malvifolia* N.E.Br.
- Thymelaeaceae (3/7)
- Gnidia aberrans* C.H. Wright
- Gnidia compacta* (C.H. Wright) J.H. Ross
- Gnidia propinqua* (Hilliard) B. Peterson
- Gnidia renniana* Hilliard & B.L. Burtt
- Gnidia singularis* Hilliard
- Passerina drakensbergensis* Hilliard & B.L. Burtt
- Struthiola angustiloba* Peterson & Hilliard
- Valerianaceae (1/1)
- Valeriana capensis* Thunb. var. *nana* B.L. Burtt
- Angiospermae–Monocotyledonae
- Alliaceae (1/1)
- Tulbaghia montana* Vosa
- Amaryllidaceae (1/1)
- Cyrtanthus erubescens* Killick
- Aponogetonaceae (1/1)
- Aponogeton ranunculiflorus* Jacot Guill. & Marais
- Asparagaceae (1/1)
- Asparagus stellatus* Baker
- Asphodelaceae (3/7)
- Aloe polyphylla* Schönland ex Pillans
- Kniphofia albomontana* Baijnath
- Kniphofia evansii* Baker
- Kniphofia hirsuta* Codd
- Kniphofia ichopensis* Schinz var. *aciformis* Codd
- Kniphofia thodei* Baker
- Trachyandra smalliana* Hilliard & B.L. Burtt
- Colchicaceae (1/3)
- Wurmbea burttii* B. Nord.
- Wurmbea pusilla* E. Phillips
- Wurmbea tenuis* (Hook.f.) Baker subsp. *australis* B. Nord.
- Cyperaceae (6/13)
- Carex killickii* Nelmes
- Carex monotropa* Nelmes
- Carex subinflata* Nelmes
- Ficinia filiculmea* B.L. Burtt
- Fuirena tenuis* P.L. Forbes
- Isolepis angelica* B.L. Burtt
- Isolepis pellocolea* B.L. Burtt
- Schoenoxiphium bracteosum* Kukkonen
- Schoenoxiphium burttii* Kukkonen
- Schoenoxiphium distinctum* Kukkonen
- Schoenoxiphium molle* Kukkonen
- Schoenoxiphium strictum* Kukkonen
- Tetraria* sp. nov. (Killick 1596 NU)
- Hyacinthaceae (6/8)
- Albuca humilis* Baker
- Albuca rupestris* Hilliard & B.L. Burtt
- Drimia saniensis* (Hilliard & B.L. Burtt) J.C. Manning & Goldblatt
- Eucomis schiffii* Reyneke
- Galtonia regalis* Hilliard & B.L. Burtt
- Merwillia dracomontana* (Hilliard & B.L. Burtt) Speta
- Ornithogalum diphyllum* Baker
- Ornithogalum septonii* Hilliard & B.L. Burtt
- Hypoxidaceae (3/6)
- Hypoxis tetramera* Hilliard & B.L. Burtt
- Rhodohypoxis deflexa* Hilliard & B.L. Burtt
- Rhodohypoxis incompta* Hilliard & B.L. Burtt
- Rhodohypoxis rubella* (Baker) Nel
- Rhodohypoxis thodiana* (Nel) Hilliard & B.L. Burtt
- Saniella verna* Hilliard & B.L. Burtt
- Iridaceae (6/23)
- Crocoshmia pearsei* Oberm.
- Dierama jucundum* Hilliard
- Gladiolus flanaganii* Baker
- Gladiolus loteniensis* Hilliard & B.L. Burtt
- Gladiolus microcarpus* G.J. Lewis
- Gladiolus saundersii* Hook.f.
- Gladiolus symonsii* F. Bolus
- Hesperantha alborosea* Hilliard & B.L. Burtt
- Hesperantha altimontana* Goldblatt
- Hesperantha baurii* Baker subsp. *formosa* Hilliard & B.L. Burtt
- Hesperantha brevistyla* Goldblatt

Hesperanthes crocopsis Hilliard & B.L. Burtt
Hesperanthes curvula Hilliard & B.L. Burtt
Hesperanthes exiliflora Goldblatt
Hesperanthes pubinervis Hilliard & B.L. Burtt
Hesperanthes schelpeana Hilliard & B.L. Burtt
Moraea alpina Goldblatt
Moraea alticola Goldblatt
Moraea ardesiaca Goldblatt
Moraea carnea Goldblatt
Moraea dracomontana Goldblatt
Romulea luteoflora (M.P. de Vos) M.P. de Vos var. *sanisensis* M.P. de Vos
Romulea macowanii Baker var. *alticola* (B.L. Burtt) M.P. de Vos

Juncaceae (1/2)
Juncus exsertus Buchenau subsp. *lesuticus* B.L. Burtt
Juncus mollifolius Hilliard & B.L. Burtt

Orchidaceae (6/11)
Brownleea galpinii Bolus subsp. *major* (Bolus) H.P. Linder
Corycium alticola Parkman & Schelpe
Disa basatorum Schltr.
Disa cephalotes Rech.f. subsp. *frigida* (Schltr.) H.P. Linder
Disa dracomontana Schelpe ex H.P. Linder
Disa galpinii Rolfe
Disa nivea H.P. Linder
Disa oreophila Bolus subsp. *erecta* H.P. Linder
Dracomonticola virginea (Bolus) H.P. Linder & Kurzweil
Huttonaea grandiflora (Schltr.) Rolfe
Schizochilus angustifolius Rolfe

Poaceae (9/12)
Agrostis subulifolia Stapf
Anthoxanthum brevifolium Stapf
Colpodium drakensbergense Hedberg & I. Hedberg
Ehrharta longigluma C.E. Hubb.
Festuca killickii Kenn.-O'Byrne
Festuca vulpioides Steud.
Helictotrichon galpinii Schweick.
Merxmüllera aureocephala (J.G. Anderson) Conert
Merxmüllera guillarmodiae Conert
Pentaschistis exserta H.P. Linder
Pentaschistis praecox H.P. Linder
Polevansia rigida De Winter

Restionaceae (1/1)
Restio galpinii Pillans

Velloziaceae (1/1)
Xerophyta longicaulis Hilliard

Numbers in parentheses after each family are total numbers of genera and species. All taxa are arranged alphabetically.

Appendix B

The near-endemic angiosperms of the Drakensberg Alpine Centre

Angiospermae – Dicotyledonae

Acanthaceae (2/2)

Adhatoda andromeda (Lindau) C.B. Clarke
Barleria monticola Oberm.

Achariaceae (1/1)

Guthriea capensis Bolus

Anacardiaceae (1/6)

Rhus bolusii Sond. ex Engl.
Rhus divaricata Eckl. & Zeyh.
Rhus dregeana Sond.
Rhus erosa Thunb.
Rhus krebsiana C. Presl ex Engl.
Rhus montana Diels

Apiaceae (4/11)

Alepidea galpinii Dummer
Alepidea longifolia E. Mey. var. *angusta* Dummer

Alepidea natalensis J.M. Wood & M.S. Evans
Alepidea pilifera Weim.
Alepidea serrata Eckl. & Zeyh. var. *serrata*
Alepidea setifera N.E.Br.
Alepidea woodii Oliv.
Conium fontanum Hilliard & B.L. Burtt var. *fontanum*
Peucedanum thodei Arnold
Polemanna montana Schltr. & H. Wolff
Polemanna simplicior Hilliard & B.L. Burtt

Apocynaceae (10/30)

Anisotoma pedunculata N.E.Br.
Asclepias cucullata (Schltr.) Schltr.
Asclepias macropus (Schltr.) Schltr.
Aspidonepsis cognata (N.E.Br.) Nicholas & Goyder
Aspidonepsis diploglossa (Turcz.) Nicholas & Goyder
Aspidonepsis flava (N.E.Br.) Nicholas & Goyder
Aspidonepsis reenensis (N.E.Br.) Nicholas & Goyder
Brachystelma petraeum R.A. Dyer
Fanninia caloglossa Harv.
Miraglossum pulchellum (Schltr.) Kupicha
Miraglossum verticillare (Schltr.) Kupicha
Pachyacris rhodantha Stewart & Langley
Pachycarpus campanulatus (Harv.) N.E.Br. var. *campanulatus*
Pachycarpus campanulatus (Harv.) N.E.Br. var. *sutherlandii* N.E.Br.
Pachycarpus macrochilus (Schltr.) N.E.Br.
Pachycarpus natalensis N.E.Br.
Pachycarpus plicatus N.E.Br.
Pachycarpus rigidus E.Mey.
Pachycarpus stenoglossus (E. Mey.) N.E.Br.
Pachycarpus vexillaris E. Mey.
Schizoglossum atropurpureum E. Mey. subsp. *atropurpureum*
Schizoglossum bidens E. Mey. subsp. *bidens*
Schizoglossum flavum Schltr.
Schizoglossum hamatum E. Mey.
Schizoglossum nitidum Schltr.
Schizoglossum stenoglossum Schltr. subsp. *latifolium* Kupicha
Xysmalobium parviflorum Harv. ex Scott-Elliot
Xysmalobium stockenstromense Scott-Elliot
Xysmalobium tysonianum (Schltr.) N.E.Br.
Xysmalobium woodii N.E.Br.

Asteraceae (29/135)

Aster perfoliatus Oliv.
Aster pleiocephalus (Harv.) Hutch.
Athrixia angustissima DC.
Athrixia arachnoidea J.M. Wood & M.S. Evans ex J.M. Wood
Athrixia fontana MacOwan
Berkheya discolor (DC.) O. Hoffm. & Muschl.
Berkheya griquana Hilliard & B.L. Burtt
Berkheya macrocephala J.M. Wood
Berkheya montana J.M. Wood & M.S. Evans
Berkheya multijuga (DC.) Roessler
Berkheya onopordifolia (DC.) O. Hoffm. ex Burtt Davy var. *onopordifolia*
Berkheya purpurea (DC.) Mast.
Berkheya rhapontica (DC.) Hutch. & Burtt Davy subsp. *aristosa* (DC.) Roessler var. *aristosa*
Berkheya rhapontica (DC.) Hutch. & Burtt Davy subsp. *aristosa* (DC.) Roessler var. *exalata* Roessler
Berkheya speciosa (DC.) O. Hoffm. subsp. *ovata* Roessler
Chrysanthemoides monilifera (L.) Norl. subsp. *canescens* (DC.) Norl.
Cineraria albicans N.E.Br.
Cineraria aspera Thunb.
Cineraria britteniae Hutch. & R.A. Dyer
Cineraria dieterlenii E. Phillips
Cineraria geraniifolia DC.
Cineraria grandibracteata Hilliard
Cineraria mollis E. Mey. ex DC.
Cotula hispida (DC.) Harv.
Cotula leptalea DC.

- Dimorphotheca caulescens* (Harv.) Harv.
Dimorphotheca jucunda E. Phillips
Euryops annae E. Phillips
Euryops candollei Harv.
Euryops empetrifolius DC.
Euryops evansii Schltr. subsp. *evansii*
Euryops oligoglossus DC. subsp. *oligoglossus*
Euryops pedunculatus N.E.Br.
Euryops tysonii E. Phillips
Felicia petiolata (Harv.) N.E.Br.
Felicia quinquenervia (Klatt) Grau
Felicia rosulata Yeo
Garuleum sonchifolium (DC.) Norl.
Garuleum woodii Schinz
Gnaphalium griquense Hilliard & B.L. Burt
Gymnopentzia bifurcata Benth.
Helichrysum albirosulatum Killick
Helichrysum albo-brunneum S. Moore
Helichrysum alticolum Bolus
Helichrysum ammitophilum Hilliard
Helichrysum anomalum Less.
Helichrysum argentissimum J.M. Wood
Helichrysum argyrophyllum DC.
Helichrysum aureum (Houtt.) Merr. var. *scopulosum* (M.D. Hend.) Hilliard
Helichrysum aureum (Houtt.) Merr. var. *serotinum* Hilliard
Helichrysum auriceps Hilliard
Helichrysum bellidiastrum Moeser
Helichrysum confertifolium Klatt
Helichrysum cooperi Harv.
Helichrysum cymosum (L.) D. Don subsp. *calvum* Hilliard
Helichrysum dasycephalum O. Hoffm.
Helichrysum elegantissimum DC.
Helichrysum epapposum Bolus
Helichrysum fulvum N.E.Br.
Helichrysum glomeratum Klatt
Helichrysum grandibracteatum M.D. Hend.
Helichrysum griseolanatum Hilliard
Helichrysum gymnocomum DC.
Helichrysum hypoleucum Harv.
Helichrysum infaustum J.M. Wood & M.S. Evans
Helichrysum krookii Moeser
Helichrysum lingulatum Hilliard
Helichrysum melanacme DC.
Helichrysum montanum DC.
Helichrysum monticola Hilliard
Helichrysum nanum Klatt
Helichrysum natalitium DC.
Helichrysum opacum Klatt
Helichrysum oreophilum Klatt
Helichrysum pedunculatum Hilliard & B.L. Burt
Helichrysum psilolepis Harv.
Helichrysum scitulium Hilliard & B.L. Burt
Helichrysum sessile DC.
Helichrysum subluteum Burt Davy
Helichrysum sutherlandii Harv.
Helichrysum tenax M.D. Hend. var. *pallidum* Hilliard & B.L. Burt
Helichrysum tenax M.D. Hend. var. *tenax*
Helichrysum trilineatum DC.
Helichrysum vernum Hilliard
Hilliardia zuurbergensis (Oliv.) B. Nord.
Hirpicium armerioides (DC.) Roessler
Inulanthera dregeana (DC.) Källersjö
Inulanthera leucoclada (DC.) Källersjö
Inulanthera montana (J.M. Wood) Källersjö
Inulanthera tridens (Oliv.) Källersjö
Lactuca tysonii (E. Phillips) C. Jeffrey
Lepidostephium asteroides (Bolus & Schltr.) Kroner
Macowania conferta (Benth.) E. Phillips
Macowania pinifolia (N.E.Br.) Kroner
Macowania pulvinaris N.E.Br.
Nidorella agria Hilliard
Pentzia cooperi Harv.
Phymaspermum woodii (Thell.) Källersjö
Printzia auriculata Harv.
Printzia pyrifolia Less.
Schistostephium hipifolium (DC.) Hutch.
Senecio arabidifolius O. Hoffm.
Senecio barbatus DC.
Senecio baurii Oliv.
Senecio brevidentatus M.D. Hend.
Senecio cathcartensis O. Hoffm.
Senecio citriceps Hilliard & B.L. Burt
Senecio flanagani E. Phillips
Senecio gramineus Harv.
Senecio harveianus MacOwan
Senecio haygarthii Hilliard
Senecio heliopsis Hilliard & B.L. Burt
Senecio hieracioides DC.
Senecio hirsutilobus Hilliard
Senecio hypochoerideus DC.
Senecio isatidioides E. Phillips & C.A. Sm.
Senecio lydenburgensis Hutch. & Burt Davy
Senecio macowanii Hilliard
Senecio macrospermus DC.
Senecio mooreanus Hutch. & Burt Davy
Senecio napifolius MacOwan
Senecio paludaffinis Hilliard
Senecio paucicalyculatus Klatt
Senecio polyodon DC. var. *subglaber* (Kuntze) Hilliard & B.L. Burt
Senecio praeteritus Killick
Senecio scitus Hutch. & Burt Davy
Senecio subcoriaceus Schltr.
Senecio subrubriflorus O. Hoffm.
Senecio tanacetopsis Hilliard
Senecio ulopterus Thell.
Sonchus jacottetianus Thell.
Troglophyton capillaceum (Thunb.) Hilliard & B.L. Burt subsp. *diffusum* (DC.) Hilliard
Ursinia alpina N.E.Br.
Ursinia montana DC. subsp. *montana*
Vernonia thodei E. Phillips
- Boraginaceae (4/6)**
Afrotysonia glochidiata (R.R. Mill) R.R. Mill
Cynoglossum austroafricanum Hilliard & B.L. Burt
Cynoglossum spelaeum Hilliard & B.L. Burt
Lithospermum afromontanum Weim.
Lithospermum papillosum Thunb.
Myosotis semiamplexicaulis A. DC.
- Brassicaceae (1/1)**
Lepidium myriocarpum Sond.
- Buddlejaceae (1/2)**
Buddleja auriculata Benth.
Buddleja loricata Leeuwenb.
- Campanulaceae (2/18)**
Craterocapsa congesta Hilliard & B.L. Burt
Craterocapsa insizwae (Zahlbr.) Hilliard & B.L. Burt
Craterocapsa montana (A.DC.) Hilliard & B.L. Burt
Craterocapsa tarsodes Hilliard & B.L. Burt
Wahlenbergia acicularis Brehmer
Wahlenbergia appressifolia Hilliard & B.L. Burt
Wahlenbergia capillata Brehmer
Wahlenbergia cooperi Brehmer
Wahlenbergia cuspidata Brehmer
Wahlenbergia depressa J.M. Wood & M.S. Evans
Wahlenbergia fasciculata Brehmer
Wahlenbergia galpiniae Schltr.

- Wahlenbergia krebsii* Cham. subsp. *krebsii*
Wahlenbergia pallidiflora Hilliard & B.L. Burtt
Wahlenbergia paucidentata Schinz
Wahlenbergia polytrichifolia Schltr. subsp. *polytrichifolia*
Wahlenbergia rivularis Diels
Wahlenbergia squamifolia Brehmer
- Caryophyllaceae (2/4)
Cerastium fontanum Baumg. subsp. *triviale* (Link) J alas
Cerastium indicum Wight & Arn.
Dianthus basuticus Burtt Davy subsp. *basuticus* var. *basuticus*
Dianthus basuticus Burtt Davy subsp. *basuticus* var. *grandiflorus* Hooper
- Crassulaceae (1/8)
Crassula compacta Schönland
Crassula gemmifera Friedrich
Crassula natalensis Schönland
Crassula peploides Harv.
Crassula setulosa Harv. var. *longiciliata* Tölken
Crassula setulosa Harv. var. *rubra* (N.E.Br.) G.D. Rowley
Crassula tenuicaulis Schönland
Crassula umbraticola N.E.Br.
- Cucurbitaceae (1/1)
Coccinia hirtella Cogn.
- Dipsacaceae (2/2)
Cephalaria natalensis Kuntze
Scabiosa drakensbergensis B.L. Burtt
- Ebenaceae (2/2)
Diospyros austro-africana De Winter var. *rubriflora* (De Winter) De Winter
Euclea coriacea A.DC.
- Ericaceae (1/12)
Erica algida Bolus
Erica alopecurus Harv. var. *alopecurus*
Erica caespitosa Hilliard & B.L. Burtt
Erica caffrorum Bolus var. *caffrorum*
Erica cooperi Bolus var. *cooperi*
Erica drakensbergensis Guthrie & Bolus
Erica evansii (N.E.Br.) E.G.H. Oliv.
Erica lasiocarpa Guthrie & Bolus
Erica oatesii Rolfe var. *oatesii*
Erica schlechteri Bolus
Erica straussiana Gilg
Erica trichoclada Guthrie & Bolus
- Euphorbiaceae (2/2)
Clutia katharinae Pax
Euphorbia natalensis Bernh.
- Fabaceae (14/33)
Argyrolobium lotoides Harv.
Argyrolobium nigrescens Dummer
Argyrolobium sankeyi Harms
Argyrolobium sericosemium Harms
Calpurnia reflexa A.J. Beaumont
Elephantorrhiza woodii E. Phillips var. *pubescens* E. Phillips
Eriosema distinctum N.E.Br.
Hoffmannseggia sandersonii (Harv.) Engl.
Indigofera cuneifolia Eckl. & Zeyh. var. *cuneifolia*
Indigofera foliosa E. Mey.
Indigofera trifolioides Baker f.
Indigofera woodii Bolus var. *woodii*
Lessertia stricta L. Bolus
Lessertia thodei L. Bolus
Lotononis adpressa N.E.Br. subsp. *adpressa*
Lotononis divaricata (Eckl. & Zeyh.) Benth.
Lotononis eriocarpa (E. Mey.) B.-E. van Wyk
Lotononis galpinii Dummer
Lotononis lanceolata (E. Mey.) Benth.
Lotononis lotononoides (Scott-Elliot) B.-E. van Wyk
Lotononis macrosepala Conrath
Lotononis procumbens Bolus
Lotononis pulchella (E. Mey.) B.-E. van Wyk
- Lotononis sericophylla* Benth.
Melolobium alpinum Eckl. & Zeyh.
Melolobium obcordatum Harv.
Otholobium caffrum (Eckl. & Zeyh.) C.H. Stirt.
Otholobium fumeum C.H. Stirt.
Otholobium polystictum (Benth. ex Harv.) C.H. Stirt.
Psoralea sp. nov.
Rhynchosia cooperi (Harv. ex Baker f.) Burtt Davy
Sutherlandia montana E. Phillips & R.A. Dyer
Tephrosia marginella H.M.L. Forbes
- Fumariaceae (1/1)
Cysticapnos pruinosa (Bernh.) Lidén
- Gentianaceae (2/6)
Chironia peglerae Prain
Sebaea natalensis Schinz
Sebaea procumbens A.W. Hill
Sebaea rehmannii Schinz
Sebaea repens Schinz
Sebaea thomasii (S. Moore) Schinz
- Geraniaceae (3/16)
Geranium brycei N.E.Br.
Geranium magniflorum R. Knuth
Geranium multisectum N.E.Br.
Geranium pulchrum N.E.Br.
Geranium robustum Kuntze
Geranium schlechteri R. Knuth
Monsonia attenuata Harv.
Monsonia brevirostrata R. Knuth
Monsonia grandifolia R. Knuth
Pelargonium aridum R.A. Dyer
Pelargonium bowkeri Harv.
Pelargonium capituliforme R. Knuth
Pelargonium dispar N.E.Br.
Pelargonium griseum R. Knuth
Pelargonium leucophyllum Turcz.
Pelargonium ranunculophyllum (Eckl. & Zeyh.) Baker
- Gesneriaceae (1/3)
Streptocarpus gardenii Hook.
Streptocarpus pentherianus Fritsch
Streptocarpus pusillus Harv. ex C.B. Clarke
- Lamiaceae (4/13)
Plectranthus grallatus Briq.
Salvia repens Burch. ex Benth. var. *transvaalensis* Hedge
Satureja reptans Killick
Stachys cymbalaria Briq.
Stachys dregeana Benth.
Stachys flexuosa Skan
Stachys hyssopoides Burch. ex Benth.
Stachys kuntzei Gürke
Stachys linearis Burch. ex Benth.
Stachys rudatisii Skan
Stachys sessilis Gürke
Stachys simplex Schltr.
Stachys tysonii Skan
- Lobeliaceae (2/7)
Cyphia aspergilloides E. Wimm. var. *aspergilloides*
Cyphia longifolia N.E.Br.
Cyphia natalensis E. Phillips
Cyphia ramosa E. Wimm.
Cyphia rogersii S. Moore subsp. *winteri* E. Wimm.
Cyphia tysonii E. Phillips
Lobelia preslii A.DC.
- Malvaceae (1/3)
Anisodontea julii (Burch. ex DC.) Bates subsp. *julii*
Anisodontea julii (Burch. ex DC.) Bates subsp. *pannosa* (Bolus) Bates
Anisodontea julii (Burch. ex DC.) Bates subsp. *prostrata* (E. Mey. ex Turcz.)
 Bates
- Melanthaceae (1/1)

- Melianthus villosus* Bolus
 Mesembryanthemaceae (2/11)
Delosperma ashtonii L. Bolus
Delosperma clavipes Lavis
Delosperma cooperi (Hook.f.) L. Bolus
Delosperma crassuloides (Haw.) L. Bolus
Delosperma hirtum (N.E.Br.) Schwantes
Delosperma lavisiae L. Bolus
Delosperma lineare L. Bolus
Delosperma roseopurpureum Lavis
Delosperma sutherlandii (Hook.f.) N.E.Br.
Delosperma wethamae L. Bolus
Ruschia putterillii (L. Bolus) L. Bolus
 Molluginaceae (1/1)
Psammotropha mucronata (Thunb.) Fenzl var. *marginata* Adamson
 Polygalaceae (2/3)
Muraltia saxicola Chodat
Polygala praticola Chodat
Polygala rhinostigma Chodat
 Polygonaceae (1/2)
Rumex dregeanus Meisn. subsp. *montanus* B.L. Burt
Rumex woodii N.E.Br.
 Proteaceae (1/2)
Protea dracomontana Beard
Protea subvestita N.E.Br.
 Ranunculaceae (2/3)
Anemone caffra (Eckl. & Zeyh.) Harv.
Anemone fanninii Harv. ex Mast.
Ranunculus baurii MacOwan
 Rhamnaceae (1/1)
Phyllica tysonii Pillans var. *tysonii*
 Rosaceae (4/8)
Alchemilla hirsuto-petiolata (De Wild.) Rothm.
Alchemilla natalensis Engl.
Alchemilla woodii Kuntze
Cliffortia browniana Burt Davy
Cliffortia paucistaminea Weim. var. *paucistaminea*
Cliffortia repens Schltr.
Geum capense Thunb.
Rubus ludwigii Eckl. & Zeyh. subsp. *spatiosus* C.H. Stirt.
 Rubiaceae (2/2)
Anthospermum monticola Puff
Galium scabrelloides Puff
 Santalaceae (1/3)
Thesium confine Sond.
Thesium macrogyne A.W. Hill
Thesium nigrum A.W. Hill
 Scrophulariaceae (13/44)
Alectra basutica (E. Phillips) Melch.
Alectra thyrsoides Melch.
Bowkeria verticillata (Eckl. & Zeyh.) Schinz
Diascia cordata N.E.Br.
Diascia integerrima E. Mey. ex Benth.
Diascia purpurea N.E.Br.
Diascia stachyoides Schltr. ex Hiern
Diascia stricta Hilliard & B.L. Burt
Glekia krebsiana (Benth.) Hilliard
Harveya scarlatina (Benth.) Hiern
Hyobanche rubra N.E.Br.
Jamesbrittenia breviflora (Schltr.) Hilliard
Jamesbrittenia filicaulis (Benth.) Hilliard
Jamesbrittenia pristispala (Hiern) Hilliard
Jamesbrittenia stricta (Benth.) Hilliard
Manulea buchneroides Hilliard & B.L. Burt
Manulea crassifolia Benth. subsp. *crassifolia*
Manulea florifera Hilliard & B.L. Burt
Manulea paniculata Benth.
Manulea rhodantha Hilliard subsp. *rhodantha*
Nemesia albiflora N.E.Br.
Nemesia caerulea Hiern
Nemesia silvatica Hilliard
Nemesia umbonata (Hiern) Hilliard & B.L. Burt
Phygelius aequalis Harv. ex Hiern
Phygelius capensis E. Mey. ex Benth.
Selago densiflora Rolfe
Selago galpinii Schltr.
Selago immersa Rolfe
Selago monticola J.M. Wood & M.S. Evans
Selago multispicata Hilliard
Selago saxatilis E. Mey.
Selago speciosa Rolfe
Selago trinervia E. Mey.
Sutera cooperi Hiern
Sutera neglecta (J.M. Wood & M.S. Evans) Hiern
Sutera polelensis Hiern subsp. *polelensis*
Zaluzianskya crocea Schltr.
Zaluzianskya distans Hiern
Zaluzianskya glareosa Hilliard & B.L. Burt
Zaluzianskya microsiphon (Kuntze) K. Schum.
Zaluzianskya pulvinata Killick
Zaluzianskya schmitziae Hilliard & B.L. Burt
Zaluzianskya spathacea (Benth.) Walp.
 Sterculiaceae (1/3)
Hermannia gerrardii Harv.
Hermannia oligosperma K. Schum.
Hermannia woodii Schinz
 Thymelaeaceae (1/2)
Gnidia baurii C.H. Wright
Gnidia polyantha Gilg
 Valerianaceae (1/1)
Valeriana capensis Thunb. var. *lanceolata* N.E.Br.
 Angiospermae—Monocotyledonae
 Agapanthaceae (1/2)
Agapanthus campanulatus F.M. Leight. subsp. *patens* (F.M. Leight.) F.M. Leight.
Agapanthus nutans F.M. Leight.
 Alliaceae (1/1)
Tulbaghia natalensis Baker
 Amaryllidaceae (3/14)
Brunsvigia grandiflora Lindl.
Brunsvigia natalensis Baker
Brunsvigia undulata F.M. Leight.
Cyrtanthus attenuatus R.A. Dyer
Cyrtanthus epiphyticus J.M. Wood
Cyrtanthus falcatus R.A. Dyer
Cyrtanthus flanaganii Baker
Cyrtanthus obrienii Baker
Cyrtanthus stenanthus Baker var. *stenanthus*
Cyrtanthus tuckii Baker var. *viridilobus* I. Verd.
Nerine angustifolia (Baker) Baker
Nerine appendiculata Baker
Nerine bowdenii Watson
Nerine pancratioides Baker
 Anthericaceae (1/1)
Chlorophytum acutum (C.H. Wright) Nordal
 Araceae (1/1)
Zantedeschia valida (Letty) Y. Singh
 Asparagaceae (1/2)
Asparagus concinnus (Baker) Kies
Asparagus microraphis (Kunth) Baker
 Asphodelaceae (3/17)
Aloe aristata Haw.
Aloe pratensis Baker
Aloe striatula Haw. var. *striatula*
Kniphofia albescens Codd

- Kniphofia angustifolia* (Baker) Codd
Kniphofia brachystachya (Zahlbr.) Codd
Kniphofia breviflora Baker
Kniphofia caulescens Baker
Kniphofia fibrosa Baker
Kniphofia fluvialis Codd
Kniphofia ichopensis Schinz var. *ichopensis*
Kniphofia northiae Baker
Kniphofia porphyrantha Baker
Kniphofia ritualis Codd
Kniphofia stricta Codd
Kniphofia triangularis Kunth subsp. *triangularis*
Trachyandra asperata Kunth var. *basutoensis* (Poelln.) Oberm.
- Colchicaceae (1/2)
- Wurmbea angustifolia* B. Nord.
Wurmbea elatior B. Nord.
- Cyperaceae (4/7)
- Carpha filifolia* Reid & T.H. Arnold
Cyperus schlechteri C.B. Clarke
Ficinia cinnamomea C.B. Clarke
Schoenoxiphium basutorum Turrill
Schoenoxiphium filiforme Kük.
Schoenoxiphium perdensum Kukkonen
Schoenoxiphium schweickerdtii Merxm. & Podlech
- Eriocaulaceae (1/1)
- Eriocaulon hydrophilum* Markötter
- Eriospermaceae (1/1)
- Eriospermum ornithogaloides* Baker
- Hyacinthaceae (7/11)
- Albuca shawii* Baker
Albuca xanthocodon Hilliard & B.L. Burtt
Drimia sphaerocephala Baker
Eucomis bicolor Baker
Eucomis humilis Baker
Galtonia candicans (Baker) Decne.
Galtonia princeps (Baker) Decne.
Galtonia viridiflora I. Verd.
Massonia echinata L.f.
Merwillia plumbea (Lindl.) Speta
Resnova lachenalioides (Baker) Van der Merwe
- Hypoxidaceae (3/13)
- Empodium elongatum* (Nel) B.L. Burtt
Empodium monophyllum (Nel) B.L. Burtt
Hypoxis costata Baker
Hypoxis lata Nel
Hypoxis ludwigii Baker
Hypoxis neliana Schinz
Hypoxis oblonga Nel
Hypoxis parvula Baker var. *albiflora* B.L. Burtt
Hypoxis parvula Baker var. *parvula*
Rhodohypoxis baurii (Baker) Nel var. *baurii*
Rhodohypoxis baurii (Baker) Nel var. *confecta* Hilliard & B.L. Burtt
Rhodohypoxis baurii (Baker) Nel var. *platypetala* (Baker) Nel
Rhodohypoxis milloides (Baker) Hilliard & B.L. Burtt
- Iridaceae (8/42)
- Aristea angolensis* Baker subsp. *acutivalvis* Weim.
Aristea angolensis Baker subsp. *majubensis* (Baker) Weim.
Aristea flexicaulis Baker
Aristea grandis Weim.
Aristea montana Baker
Crocasmia pottsii (Macnab ex Baker) N.E.Br.
Dierama ambiguum Hilliard
Dierama cooperi N.E.Br.
Dierama dissimile Hilliard
Dierama dracomontanum Hilliard
Dierama latifolium N.E.Br.
Dierama pauciflorum N.E.Br.
Dierama pictum N.E.Br.
Dierama robustum N.E.Br.
Dierama trichorhizum (Baker) N.E.Br.
Dierama tysonii N.E.Br.
Gladiolus inandensis Baker
Gladiolus mortoni Herb.
Gladiolus oppositiflorus Herb.
Gladiolus parvulus Schltr.
Gladiolus pubigerus G.J.Lewis
Hesperantha candida Baker
Hesperantha glareosa Hilliard & B.L. Burtt
Hesperantha grandiflora G.J.Lewis
Hesperantha hygrophila Hilliard & B.L. Burtt
Hesperantha ingeliensis Hilliard & B.L. Burtt
Hesperantha scopulosa Hilliard & B.L. Burtt
Hesperantha vernalis Hilliard & B.L. Burtt
Hesperantha woodii Baker
Moraea albicuspa Goldblatt
Moraea brevistyla (Goldblatt) Goldblatt
Moraea hiemalis Goldblatt
Moraea huttonii (Baker) Oberm.
Moraea inclinata Goldblatt
Moraea modesta Killick
Moraea robusta (Goldblatt) Goldblatt
Moraea trifida R.C. Foster
Moraea unibracteata Goldblatt
Romulea macowanii Baker var. *macowanii*
Romulea macowanii Baker var. *oreophila* M.P. de Vos
Watsonia gladioloides Schltr.
Watsonia lepida N.E.Br.
- Orchidaceae (11/41)
- Brownleea macroceras* Sond.
Corycium flanagani (Bolus) Kurzweil & H.P. Linder
Corycium tricuspdatum Bolus
Disa cephalotes Rchb.f. subsp. *cephalotes*
Disa cooperi Rchb.f.
Disa crassicornis Lindl.
Disa montana Sond.
Disa oreophila Bolus subsp. *oreophila*
Disa patula Sond. var. *patula*
Disa pulchra Sond.
Disa sanguinea Sond.
Disa sankeyi Rolfe
Disa scullyi Bolus
Disa stricta Sond.
Disa thodei Schltr. ex Kraenzl.
Disa tysonii Bolus
Disperis cardiophora Harv.
Disperis concinna Schltr.
Disperis cooperi Harv.
Disperis oxyglossa Bolus
Disperis renibractea Schltr.
Disperis stenoplectron Rchb.f.
Disperis tysonii Bolus
Disperis wealei Rchb.f.
Eulophia calanthoides Schltr.
Eulophia zeyheriana Sond.
Holothrix incurva Lindl.
Holothrix scopularia (Lindl.) Rchb.f.
Holothrix thodei Rolfe
Huttonaea fimbriata (Harv.) Rchb.f.
Huttonaea oreophila Schltr.
Huttonaea pulchra Harv.
Huttonaea woodii Schltr.
Neobolusia tysonii (Bolus) Schltr.
Pterygodium cooperi Rolfe
Pterygodium hastatum Bolus
Pterygodium leucanthum Bolus
Satyrion longicauda Lindl. var. *jacottetianum* (Kraenzl.) A.V. Hall

Satyrium microrrhynchum Schltr.
Schizochilus bulbinella (Rehb.f.) Bolus
Schizochilus flexuosus Harv. ex Rolfe
 Poaceae (13/27)
Agrostis barbuligera Stapf var. *barbuligera*
Andropogon ravus J.G. Anderson
Aristida junciformis Trin. & Rupr. subsp. *galpinii* (Stapf) De Winter
Aristida monticola Henrard
Brachypodium bolusii Stapf
Bromus firmior (Nees) Stapf
Bromus natalensis Stapf
Bromus speciosus Nees
Catalepis gracilis Stapf & Stent
Festuca costata Nees
Festuca dracomontana H.P. Linder
Festuca longipes Stapf
Helictotrichon longifolium (Nees) Schweick.
Merxmüllera drakensbergensis (Schweick.) Conert
Merxmüllera macowanii (Stapf) Conert
Merxmüllera stereophylla (J.G. Anderson) Conert
Pentaschistis airoides (Nees) Stapf subsp. *jugorum* (Stapf) H.P. Linder
Pentaschistis aurea (Steud.) McClean subsp. *pilosogluma* (McClean) H.P. Linder
Pentaschistis basutorum Stapf
Pentaschistis galpinii (Stapf) McClean
Pentaschistis microphylla (Nees) McClean
Pentaschistis oreodoxa Schweick.
Pentaschistis setifolia (Thunb.) McClean
Pentaschistis tysonii Stapf
Setaria obscura de Wit
Stiburus conrathii Hack.
Thamnocalamus tessellatus (Nees) Soderstr. & R.P. Ellis

Numbers in parentheses after each family are total numbers of genera and species. All taxa are arranged alphabetically.

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