

Short communication

A new species of *Alepidea* (Apiaceae, subfam. Saniculoideae)

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Abstract

The current concept of *Alepidea amatymbica* Eckl. and Zeyh. embraces two distinct species which can be distinguished on the basis of leaf morphology: (1) *A. amatymbica* sensu stricto, which has the radical leaves attenuate at their bases and (2) *A. cordifolia* B.-E. Van Wyk, a new species with the radical leaves cordate at their bases. The new species also differs in the presence of minute hispid hairs on the terminal parts of the peduncles and sometimes also on the basal parts of the involucre and the sepals, styles and stylopodium. The two species are vicariants, with *A. amatymbica* occurring from the Eastern Cape Province northwards to the southwestern parts of KwaZulu–Natal and *A. cordifolia* from here northwards to Lesotho, Swaziland, Mpumalanga Province and eastern Zimbabwe.

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1. Introduction

Alepidea is a genus of ±25 species with a wide distribution range in southern and eastern Africa, from South Africa northwards to Kenya and Ethiopia (Dömmmer, 1913; Weimarck, 1949; Cannon and Constance, 1978; Cannon and Sampaio Martins, 1981; Germishuizen et al., 2006; Klopper et al., 2006). The plants are characterised by simple leaves with markedly toothed and setaceous or bristly margins, attractive pseudanthia with prominent involucre bracts, and sessile flowers. As is suggested by these morphological features, the genus is firmly placed in the subfamily Saniculoideae, a position confirmed by recent molecular systematic studies (e.g. Calviño and Downie, 2007).

Alepidea amatymbica is an important source of traditional medicine (Watt and Breyer-Brandwijk, 1962; Hutchings et al., 1996; Van Wyk et al., 1997). The highly resinous rhizomes contain kaurene-type diterpenoids (Rustaiyan and Sadjadi, 1987; Holzapfel et al., 1995) and are commonly sold on

traditional markets as *Ikhathazo* (IsiZulu) or *lesoko* (Sesotho). The rhizomes and roots are widely used as a general medicine for a variety of ailments, including respiratory tract infections and gastro-intestinal complaints (De Castro and Van Wyk, 1994). *In vitro* studies have shown that crude extracts of *A. amatymbica* have anti-hypertensive, antibacterial and diuretic properties (Hutchings, 1989).

As part of our ongoing project on the taxonomy of African Apiaceae (e.g. Van Wyk and Tilney, 2004; Calviño et al., 2006; Magee et al. (in press); Winter et al., 2008), we here provide clarity on the circumscription of this important member of the genus. Herbarium and field studies over a period of several years have revealed the presence of a distinct new species, hitherto confused with *A. amatymbica*. The distinction is of considerable importance to plant conservationists, as fairly large quantities of *ikhathazo* are regularly available on traditional muthi markets.

2. Species treatment

Alepidea cordifolia B.-E. Van Wyk sp. nov., *differt a A. amatymbicae foliis late cordatis*. TYPE — South Africa, Free State Province, farm Rensburgkop [2829AC, near Harrismith], Jacobsz 339 (NBG!, holo.) (Fig. 1).

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Fig. 1. Holotype of *Alepidea cordifolia* in NBG, showing the cordate radical leaves typical of the species.

A. amatymbica Eckl. and Zeyh. var. *cordata* Sond. in Harv. and Sond., Fl. Cap. 2: 534 (1862); B.L. Burtt in Edinb. J. Bot. 48: 164 (1991). TYPE — South Africa, [Free State Province], “Dornkop, near Sandriver” [Doornkop, 2827DD Senekal], Zeyher 728 (K!, S?, TCD?). [Note: The formal lectotypification of the numerous varieties of *Alepidea* is a complicated matter that will be dealt with in a comprehensive revision of the genus. The locality and description of Zeyher 728 leaves no doubt about its identity].

Robust, acaulescent, perennial herb with one or more rosettes of leaves and sturdy, erect, hollow, grooved, leafy inflorescences, 1.0–1.8 m high. Roots numerous, slightly fleshy, arising on thick, resinous rhizomes up to 25 mm in diameter. Basal leaves simple, large, up to 480 mm long, distinctly petiolate, petioles up to 200 mm long and 10 mm in diameter, lamina narrowly ovate to oblong, (90–) 120–220 (–370) mm × 35–60 (–70) mm, cordate at the base, reticulate, margin regularly dentate, with each tooth protracted into a hair-like trichome 1–4 mm long; cauline leaves usually sessile, lamina ovate to ovate-oblong, variable in size, decreasing in size acropetally and gradually merging with the bracts, up to 120 × 50 mm, margin regularly dentate, with setae up to 3 mm long. Inflorescence scape up to 1.8 m, racemously or

paniculately branched from below the middle, with the lateral branches short or long, minutely hispid in the upper parts. Pseudanthia andromonoecious, numerous, 7 to 10-flowered, 8–12 (–15) mm in diameter, surrounded by 5 spreading or incurved bracteoles usually alternating with 5 much smaller bracteoles, bracteoles oblong, up to 8 × 3 mm, acute, coriaceous, keeled and nerved, green beneath, white above, sometimes with hispid hairs at the base. Flowers sessile; calyx lobes deltoid to ovate, ±0.2 mm long, sometimes minutely hispid at the base; petals oblong, ±1 mm long, white, with apex narrowed, inflexed. Styles erect or spreading, short. Stylopodium flat, margin lobed. Fruit ovoid to suborbicular, ±3 mm long (excluding stylopodium), ±3 mm wide, glabrous, smooth or very sparsely muricate at apex only, ±terete in transverse section; mericarps isodiametric or slightly dorsally compressed, commissure narrow, ribs prominent, obtuse, with solitary, very large oil duct in each rib, carpophore undivided. Seeds planoconvex and slightly to fairly deeply sulcate, especially beneath the dorsal rib oil ducts, commissural face flat, slightly concave or slightly convex.

Unlike Sonder (1862) most authors treated the attenuate and cordate-leaved forms in *A. amatymbica* as a single taxon. These include Dümmer (1913), Wolff (1913), Weimarck (1949), Cannon and Constance (1978) and Cannon and Sampaio Martins (1981). Burtt (1991) listed several varieties of *A. amatymbica* and noted the need for more detailed studies.

3. Diagnostic characters and relationships

A. cordifolia is easily identified by the cordate leaf bases of the radical leaves (Fig. 2). When basal leaves are not available, the hispid hairs on at least some of the peduncles or bracts are diagnostic (Fig. 2). Hairs are often also present on the sepals, petals, stylopodia and styles. Burtt (1991) noted the presence of dense papillose hairs on some specimens of “*A. amatymbica*”, and which are now understood to represent individuals of *A. cordifolia*. Such hairs are not found elsewhere in the genus except in *A. multisecta* B.L. Burtt, where they are a distinct feature, or sporadically in *A. peduncularis* A.Rich. No trichomes could be found on any of the specimens of *A. amatymbica* available to us. The morphology and anatomy of the rhizomes and fruits of the two species (Fig. 3) are very similar and did not show any taxonomically significant differences. The fruits of both species are typical of the subfamily Saniculoideae in having very large rib oil ducts and no vittae (Fig. 3) but somewhat atypical in having practically no surface protuberances. Fruits of *A. cordifolia*, however, can usually be distinguished by the presence of at least some hairs on the sepals, stylopodium and styles. It may be useful to study the diterpenoids of the two species (Rustaiyan and Sadjadi, 1987; Holzapfel et al., 1995), as a preliminary investigation indicated some quantitative differences in the main compounds.

4. Distribution and habitat

Alepidea cordifolia is geographically separated from *A. amatymbica* and occurs from KwaZulu–Natal northwards and eastwards to Lesotho, Mpumalanga Province, Mozambique and

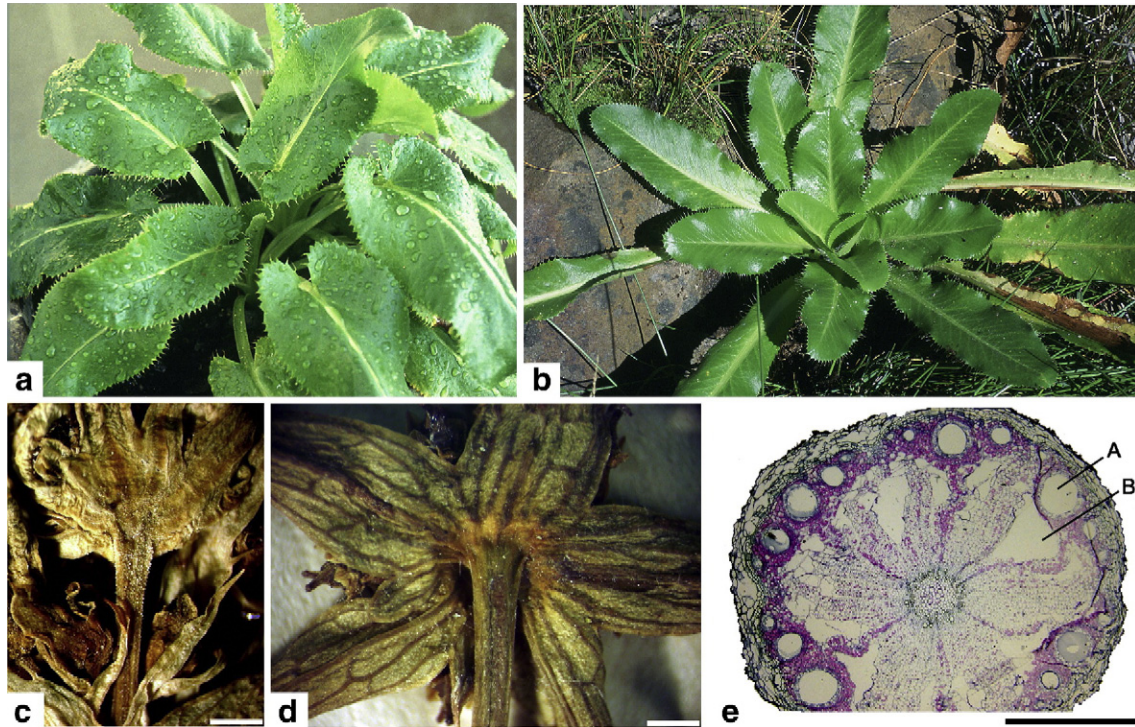


Fig. 2. Morphology of *Alepidea cordifolia* and *A. amatymbica*. (a) plant of *A. cordifolia*, showing the cordate radical leaves; (b) plant of *A. amatymbica*, showing the basally attenuate radical leaves; (c) peduncle and bracts of *A. cordifolia* (with hispid hairs); (d) peduncle and bracts of *A. amatymbica* (glabrous). (e) root of *A. cordifolia* in transverse section, showing the oil ducts (A) and schizogenous cavities (B); Voucher specimens: (a) Winter 6917 (PRE); (b) De Castro 269 (JRAU); (c) Phillips 673 (SAM); (d) Flanagan 2277 (PRE); (e) De Castro 143 (JRAU). Scale bars: (c, d) = 2 mm, (e) = 1 mm.

eastern Zimbabwe (Fig. 4). *A. amatymbica* is \pm restricted to the Eastern Cape Province of South Africa and the south-western parts of KwaZulu–Natal. Both species occur to the west of

Pietermaritzburg, between Impendhle and Richmond. In this area, *A. amatymbica* occurs at lower elevations, while *A. cordifolia* is found at higher altitudes — the two species may be found in

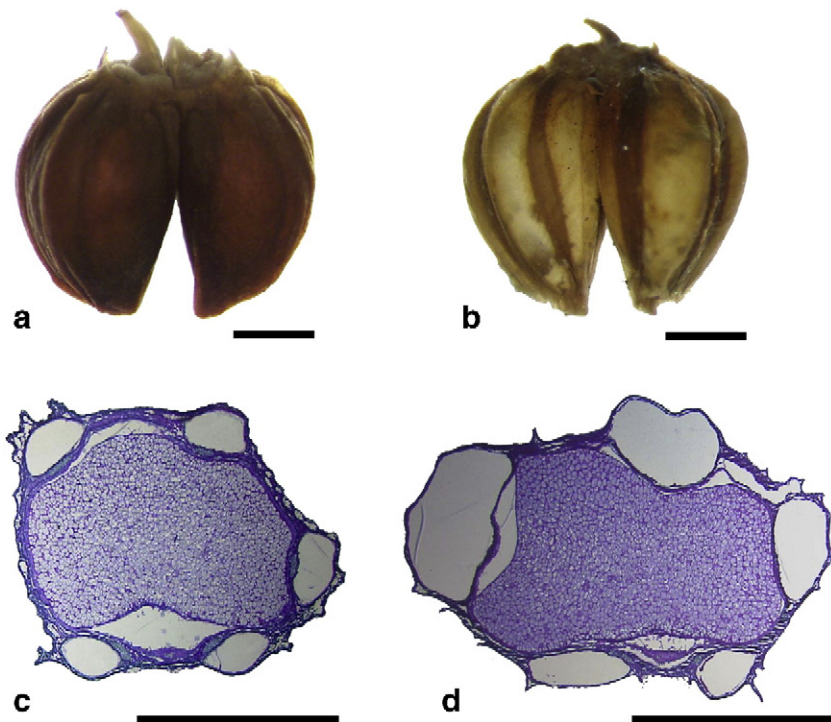


Fig. 3. Fruit morphology and anatomy of *Alepidea cordifolia* and *A. amatymbica*. (a) fruit of *A. cordifolia*; (b) fruit of *A. amatymbica*; (c) fruit of *A. cordifolia* in transverse section; (d) fruit of *A. amatymbica* in transverse section. Voucher specimens: (a, c) Phillipson 1391 (PRE); (b, d) Galpin 6641 (PRE). Scale bars: 1 mm.

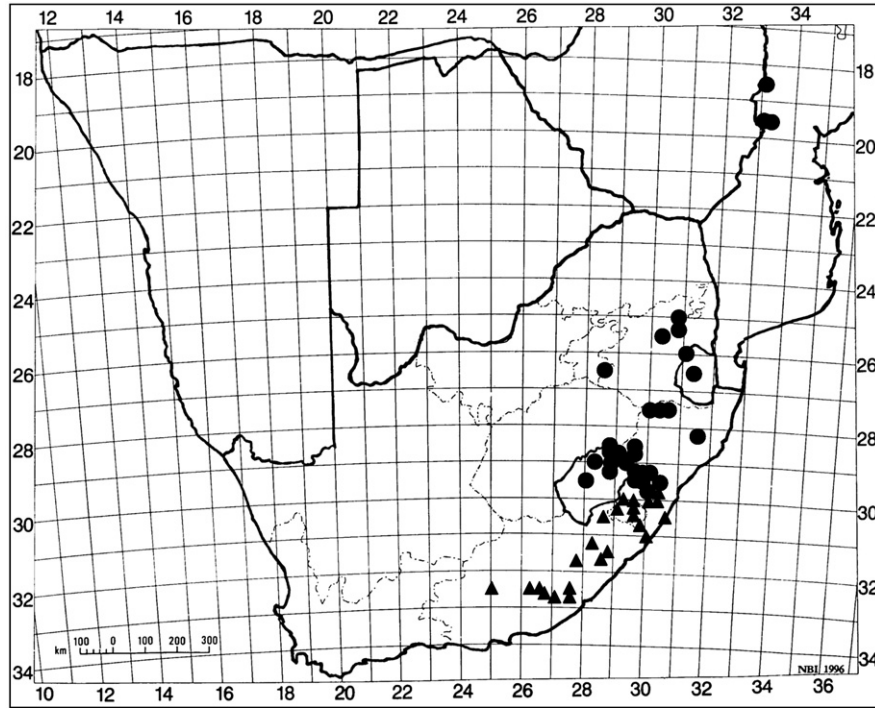


Fig. 4. The known geographical distributions of *Alepidea cordifolia* (dots) and *A. amatymbica* (triangles).

close proximity but their distribution areas do not appear to overlap. Both species grow in open grassland or on forest margins, often amongst rocks and/or along streams.

5. Flowering time

Flowering in *A. cordifolia* occurs in summer, mainly in February and March, with fruits present up to May. The herbarium record and field observations indicate that there are no differences in the flowering time between *A. cordifolia* and *A. amatymbica*.

6. Additional specimens of *Alepidea cordifolia* examined

6.1. Zimbabwe

Eastern Highlands. — 1832 (Mutare): Nyanga, Nyazengu Private Nature Reserve, Nyazengu trail, on N side of *Afrocrania* forest, (–BD), *Winter 1632* (PRE).

1932 (Chimanimani): Umtali [Mutare], Tsetsera farm, (–BD), *Mavi 1484* (K); Umtali [Mutare], Himalaya Mts, Engwa farm, (–BD), *Wild 4464* (BM, PRE).

6.2. Moçambique

Manica a Sofala. — 1932 (Chimanimani): Zuirra Range, Tsetsera, (–BD), *E. M. and W. 221* (BM).

6.3. South africa

Gauteng. — 2628 (Johannesburg): Suikerbosrand, Heidelberg Kloof, (–AD), *Flugge de Smidt s.n. in C.E. Moss 18146* (J).

Mpumalanga. — 2430 (Pilgrim's Rest): Mt Sheba N.R., (–DC), *Kerfoot et al. 334* (J).

2530 (Lydenburg): Steenkampsberg Natuureservaat, plaas Verloren Vallei 95 JT, (–AC), *Bloem 60* (PRE, PRU); Dullstroom, farm Klipbankspruit, (–AC), *Burgoyne 155* (PRE); Dullstroom, (–AC), *Galpin 12200* (PRE); Verlorenvallei Nature Reserve, (–AC), *Van Slageren et al. MSEWPS975* (PRE); Verlorenkloof, stream at Fernkloof hiker's hut, (–AC), *Winter 6866* (PRE);

Lydenburg, Mokobulaan Plantations, The Vlei, (–BA), *Burrows and Parker 6663* (PRE); Mokobulaan Plantasie, Skurweberg, (–BA), *Kluge 2674* (PRE); Hartebeestvlakte, Ceylon Forest Reserve, (–BA), *Deall 2451* (PRE), *Mohle 480* (PRE); Barberton, Montrose, (–DD), *Galpin 1344* (K, PRE).

2730 (Vryheid): Wakkerstroom, (–AC), *Beeton 173* (PRE, SAM); "North Hill", (–AC), *Galpin 9805* (K, PRE); Between Wakkerstroom and Paulpietersburg, 4 km after turnoff to Groenvlei, (–AC), *Jordaan 2817* (PRE); Naauwhoekberge, (–AC), *Swartz 93/94WR* (PRE); Farm Oshoek, (–AD), *Devenish 570* (K, PRE).

Free State. — 2828 (Bethlehem): Golden Gate National Park, Melsetter summit near stream, (–BC), *Roberts 3372* (PRE); Golden Gate National Park, Glen Reenen camp, (–DA), *Spies s.n. in PRE 47938* (PRE); E of Glen Reenen dam, (–DA), *Winter 6917* (PRE).

2829 (Harrismith): Harrismith, Farm Rensburg's Kop, (–AC), *Jacobsz 339* (NBG, PRE); Platberg, path to Gibson dam, (–AC), *Jacobsz 2521* (K, NBG, PRE).

KwaZulu–Natal. — 2729 (Volksrust): Majuba, (–BD), *Rogers in TRV 3309* (PRE).

2828 (Bethlehem): Mont Aux Sources, Tugela Valley, (–DB), *Bayer and McClean 72* (K, PRE); Drakensberg National Park, on

path to ‘The Gorge’, 5 miles W of hostel, (–DB), *Codd and Dyer 2790* (K, PRE).

2829 (Harrismith): Near Van Reenen, (–AD), *Phillips in PRE 47956* (PRE), *Schlechter 6955* (K, NBG, PRE, S, UPS, W); Northern Drakensberg, Little Switzerland, (–CB), *Anderson 284* (PRE); Cathedral Peak Forest Research Stn., (–CC), *Killick 1410* (K, PRE).

2831 (Nkandla): Mahlabatini, Madlozi mountain, (–AB), *Gerstner 4607* (K sheets, PRE); Mahlabatini, (–AB?), *Gerstner 4608* (PRE).

2929 (Underberg): Northern Drakensberg, Cathkin Park, (–AB), *Galpin 11766* (K, PRE); Champagne Castle, (–AB), *Smith 8251A* (PRE); Giant’s Castle, (–AD), *Symons 441* (PRE); Giant’s Castle Game Reserve, Bannerman Pass, (–AD), *Trauseld 557* (PRE); Giant’s Castle, (–AD), *Wright 422* (K). Tabamhlope mountain, (–BA), *West 175* (PRE); Mooiriver Station, (–BB), *Kuntze s.n. 15/4/1894* (K); Weenen Div., Culvers, (–BC), *Rogers 27600* (K); Southern Drakensberg, between Nottingham Road and Loteni, Rooi Draai River ±55 km NE of Himeville, (–BC), *Winter 1912* (PRE); Mpendle, farm Happy Valley, Hill W of farmhouse, western base, (–DB), *Winter 252* (PRE).

2930 (Pietermaritzburg): Mooirivier, Mt West, upstream of weir, (–AC), *Winter and Campbell 1776* (JRAU).

6.4. Swaziland

—**2631** (Mbabane): Hull’s farm, (–AC), *Compton 25610* (K, NBG); Mbabane, (–AC), *Ormerod s.n. in PRE 51839* (PRE).

6.5. Lesotho

—**2828** (Leribe): Leribe, (–CC), *Dieterlen 32* (K — 2 sheets, PRE, SAM), *Phillips 673, 723, 750, 761* (SAM). Moteng Pass, near Oxbow, (–DC), *Phillipson 1391* (K, PRE).

2927 (Maseru): Mountain Road, (–BD), *Schmitz 644* (PRE); Between Molima Nthuse and Blue Mt Pass, (–BD), *Schmitz 8250* (PRE).

2928 (Marakabei): Liseleng Valley, (–BA), *Coetsee 530* (PRE); *Jacot–Guillarmod 2294* (PRE).

6.6. Precise locality unknown

South Africa: Orange Free State, Cooper 1017 (K).

7. Additional specimens of *A. amatymbica* examined

7.1. South africa

KwaZulu–Natal. — **2929** (Underberg): Southern Drakensberg, S face of ‘Three Bushmen’, (–CC), *Beverley 689* (PRE); Drakensberg Garden Hotel, near entry of forestry [reserve], close to Mlambonja River, (–CC), *Goetghebeur 4524* (PRE); Forestry Reserve just beyond Busman’s Nek police post, (–CC), *Hilliard and Burt 8009* (K); Above Bushman’s Nek, vicinity of Tarn Cave, (–CC), *Hilliard and Burt 17447* (PRE); Drakensberg Garden, (–CC), *Lambinon and Reekmans 82/324* (PRE); 20

miles SSW of Underberg, (–CD), *Acocks 22044* (K, PRE); Underberg, (–CD), *McClellan 615* (PRE); Mpendle, farm Happy Valley, Hill W of farmhouse, S slope above steep sandstone outcrop, (–DB), *Winter 256* (PRE); Bulwer, Kukamahutsha Bush, (–DD), *McClellan 243* (PRE).

2930 (Pietermaritzburg): Dargle State Forest, grasslands below look-out tower, (–CA), *Nicholas, Fokkens and McLoughlin 1786* (K, PRE); Hills above Byrne Valley, (–CC), *Stewart 1752* (K); Keerom, Byrne, (–CC), *Strey 10850* (PRE); Byrne, (–CC), *Wood s.n. in SAM 3289* (SAM).

3030 (Port Shepstone): Dumisa, Fairfield, Ifafa, (–AD), *Rudatis 1337* (K, PRE); Dumisa, Campbellton (–AD), *Rudatis 1808* (S).

Eastern Cape Province. — **3028** (Matatiele): Thaba Chitja Ridge above York, (–AD), *Hutchings and Hutchings 1453* (KEI); Ramatsilanes Gate, (–BB), *Bayliss 1356* (PRE).

3029 (Kokstad): Nsikeni, W-facing mountainside, (–AB), *Abbott 6302* (PRU); Ntsikeni Nature Reserve, SW face of the Swartberg, (–AB), *Abbott 7618* (PRU); Ntsikeni, Lubhukwini, (–AB), *Wopula 84* (KEI), *Abbott 5754* (PRE, PRU); Kokstad, Mt Currie, (–AD), *Tyson 1704* (PRE, SAM); Weza, Ngele Nature Reserve, (–DA), *Abbott 7087* (PRU); Ngeli Mountain foothills, (–DA), *Van Wyk 7472* (PRE); Near Clydesdale, (–DD), *Tyson 1276* (K, SAM, UPS, W), *2737* (K, SAM).

3127 (Lady Frere): Cala, (–DA), *Pegler 1670* (K, PRE).

3128 (Umtata): Maclear, Prentjiesberg, Farm Lanark c. 10 km N of Ugie, (–AA), *Bester 348, 349* (PRU); Maclear, Farm Cromarty c. 18 km W of Ugie, (–AA), *Bester 2692* (PRU); Maclear, Farm Midlothian, (–AA), *Galpin 6641* (K, PRE); Maclear, Boundary of Pondo Gates and Ben Farraday, (–AA), *Van Wyk and Abbott 12154* (PRU); Mhlahlane, Gorge c. 2 km N of ridge above Mhlahlane station, (–BC) *Cloete 158* (KEI); Kaffraria, Mt Baziya, (–CB), *Baur 115* (K).

3224 (Graaff–Reinet): Zuurbergen, (–BD), *Schlechter in TRV 6591* (PRE).

3226 (Fort Beaufort): Bedford, Baviansrivierberg, Schone’s farm, (–AC), *Killick 840* (PRE); Winterberg, summit, (–AD), *Ecklon and Zeyher 2189* (K, S, SAM, W); Katberg, (–BC/DA), *Hutton s.n.* (K); Hogsback, (–DB), *Bokelman 1-PL 55* (NBG), Top of Mitchell’s Pass, (–DB), De Castro 269 (JRAU), Hogsback, Lower slopes of Gaika’s Kop, (–DB), *Gibbs–Russel 3502* (PRE), Hogsback, below Tor Doone, (–DB), *Hutchings 362* (KEI).

3227 (Stutterheim): Stutterheim, near Toise River R. station, (–AD), *Flanagan 2277* (PRE, S, SAM, W), *Kuntze s.n., 27/2/1894* (K); Stutterheim commonage, (–CB), *Acocks 9711* (K, PRE); Dohne Hill, (–CB), *Sim s.n. in PRE 47919* (PRE); King William’s Town, Perie, (–CB), *Sim s.n. in PRE 47920* (PRE); Frankfort C.C., (–CB), *Sim s.n. in PRE 47923* (PRE).

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