

Revision of the *Tarchonanthus camphoratus* complex (Asteraceae-Tarchoanthaeae) in southern Africa

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Keywords: Asteraceae, new species, resurrected names, revision, southern Africa, *Tarchonanthus camphoratus* L.

ABSTRACT

The *Tarchonanthus camphoratus* L. complex in southern Africa is revised. Five species are recognized on the grounds of differences in synflorescences, flowering times, leaf shape and margin, and distribution. Two names, *T. minor* Less. and *T. obovatus* DC., are resurrected and two new species, *T. littoralis* P.P.J.Herman and *T. parvicapitulatus* P.P.J.Herman, are described. A key, full descriptions of each taxon and distribution data are presented.

INTRODUCTION

Plants belonging to the *Tarchonanthus camphoratus* L. complex are well known in southern Africa and are commonly known as camphor bush/*kanferbos* (Afrikaans) (Smith 1966; De Winter *et al.* 1978) or African fleabane, camphor wood, sagewood, wild cotton, wild sage, *basterolien*, *bastervaalbos*, *bergvaalbos*, *kanferboom*, *kanferhout*, *kapokboom*, *kleinvaalbos*, *salie*, *saliehout*, *vaalbos*, *veldvaalbos*, *waaibos*, *wildesalie* and *witbos* (Afrikaans) (Wells *et al.* 1986), or camphor tree, *siriehout* (Afrikaans), *isiDuli selindle* (Xhosa), *isiDulisehlathi*, *iGqebe-elimhlophe* (Zulu), *mofahlana* (South Sotho), *mohattha* (Tswana), *sefahla* (North Sotho), *moologa* (Venda) and *omutea* (Herero) (Palmer & Pitman 1972). Various parts of the plants are used medicinally (Watt & Breyer-Brandwijk 1962; Smith 1966; Palmer & Pitman 1972). The wood was used for turnery, boat-building, musical instruments, cabinet work, fence posts, shafts of spears and walking sticks (Smith 1966; Palmer & Pitman 1972; Coates Palgrave 1977). *Tarchonanthus camphoratus* is used as a fodder plant in dry areas (Smith 1966; Palmer & Pitman 1972; Tree Society of Southern Africa 1974). It is a very common element in some areas and some veldtypes have been named after it, e.g. the subdivisions of the Vryburg Shrub Bushveld by Acocks (1988) into the *Tarchonanthus* Veld of the Ghaap Plateau, the Mixed *Tarchonanthus* Veld of the Asbestos and Kuruman Hills, the Mixed *Tarchonanthus-Rhus-Croton* Veld of the Langeberg and the Mixed *Tarchonanthus-Thornveld* of the Kimberley plains and koppies. In all these cases, *Tarchonanthus camphoratus* L. *sens. str.* is involved.

A number of different names have been published for various *Tarchonanthus* taxa, but they were all put into synonymy under *T. camphoratus* by Paiva (1972) and subsequently by Hilliard (1977), Pope (1992) and Beentje (1999). Several workers maintained that there were different taxa under *T. camphoratus* (Acocks 1988; A. Gubb pers. comm.), with differences in palatability

(Burchell 1824; A. Gubb pers. comm.). While I was preparing a manuscript for *Flowering Plants of Africa* (Herman & Condy 2001), it became clear that there were in fact a number of different taxa grouped under *T. camphoratus*. Differences in synflorescences, flowering times, leaf shape and margin and distribution, led to the recognition of five species. Two names are herewith resurrected and two new species described.

The septate hairs present in the capitula, which can be considered a generic characteristic for the genus, are described by Herman (2001). The descriptions of the leaf shapes are based on that proposed by Radford *et al.* (1974) and Radford (1986).

Key to species of *Tarchonanthus*

For the sake of completeness, *Tarchonanthus trilobus* (also occurring in southern Africa) is included in the key.

- 1a Involucral bracts of male and female capitula linear, free; adaxial leaf surfaces bullate (Figure 1A) *T. trilobus*
- 1b Involucral bracts of male and female capitula lanceolate, elliptic, ovate or obovate, free, or of male capitula fused to \pm halfway; adaxial leaf surfaces reticulate (Figure 1B):
 - 2a Capitula in dense, spicate, axillary or terminal clusters (Figure 2A, C); involucral bracts of male and female capitula free; peak flowering time September to December (spring to early summer) 1. *T. minor*
 - 2b Capitula in lax, open panicles (Figure 2B, D); involucral bracts of male capitula fused to halfway, of female capitula free; peak flowering time February to August (late summer, autumn and winter):
 - 3a Leaf margins always entire:
 - 4a Leaves narrowly elliptic to slightly oblanceolate, acute or obtuse; cottony hairs enveloping cypselas creamy or yellowish; widespread 3. *T. camphoratus*
 - 4b Leaves obovate or elliptic, obtuse or acute; cottony hairs enveloping cypselas pure white; restricted to Gordonia area (Northern Cape) mostly on iron stone or limestone base in sandy soils 4. *T. obovatus*
 - 3b Leaf margins often faintly denticulate in upper part or entire:
 - 5a Leaves large, up to 140 \times 45 mm; petioles up to 12 mm long; fruiting capitula large, up to 15 mm diam.; growing along coast from southern KwaZulu-Natal to Western Cape 2. *T. littoralis*
 - 5b Leaves smaller, up to 60 \times 16 mm; petioles up to 5 mm long; fruiting capitula small, up to 10 mm diam.:

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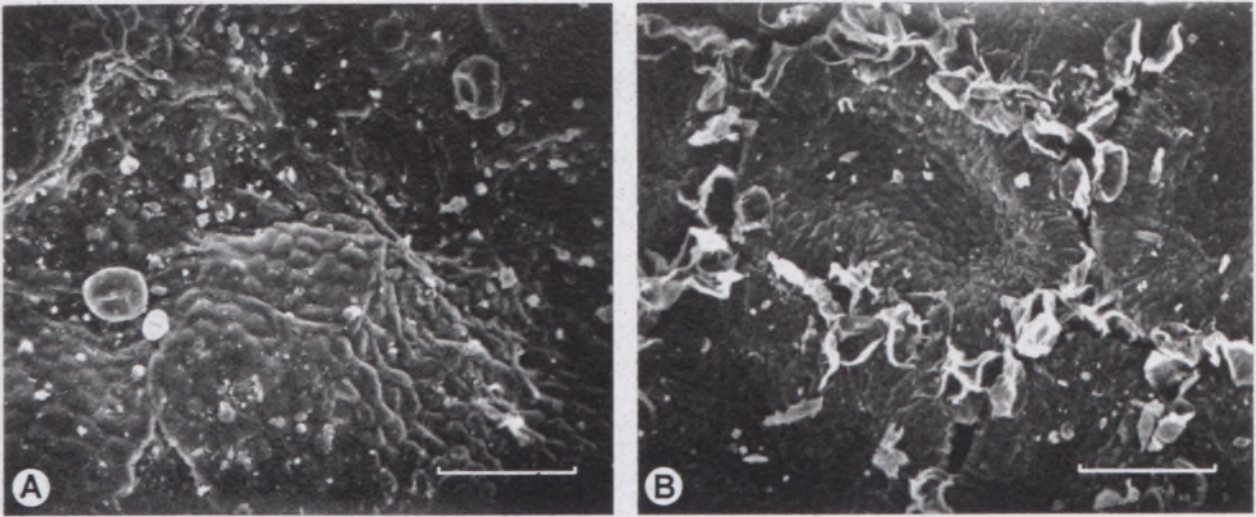


FIGURE 1.—Scanning electron micrographs of adaxial leaf surfaces of *Tarchonanthus* species. A, bullate surface of *T. trilobus* var. *trilobus*, *Strey 9016* (PRE); B, reticulate surface of *T. minor*, *Leistner 495* (PRE). Scale bars: 100 μ m.

growing inland, occurring in forests, valleys or bushveld on mountain slopes, hills and river banks; Northern Province, North-West, Gauteng, Mpumalanga, Swaziland and KwaZulu-Natal . . .

..... 5. *T. parvicapitulatus*

1. ***Tarchonanthus minor* Less.**, Synopsis generum Compositarum: 208 (1832); DC.: 431 (1836); Harv.: 118 (1865). Type: South Africa, [Orange] Free State, 2925 Jagersfontein, Fauresmith, under edge of plateau of Langeberg, (-CB), NW slope, 21 October 1925, *Smith 942* (PRE!, neotype, here designated).

T. angustissimus DC.: 431 (1836). Syntype: South Africa, [Northern] Cape, Philipstown, on the Table Mountain, near Horse's Grave (= Paardeberg), ??Karrapoort, *Burchell 2691* [G-DC; K!], lecto. chosen by Beentje: *Kew Bulletin* 54,1: 83 (1999)-PRE photo.!

Dioecious shrub or small tree up to 5 m high. *Leaves* aromatic, alternate, small, narrowly elliptic (Figure 3A), 10–40(–52) \times 2.5–15.0 mm, discolorous, upper surface bright to dark green, pubescent when young, becoming glabrous except for hairs in lower half of furrow caused by sunken main vein, reticulate, with golden glands on margins of reticulations (Figure 1B), lower surface densely whitish tomentose; apex acute, often mucronate subapically; base cuneate; margin entire, rarely denticulate. *Petiole* 1–3 (rarely up to 5) mm long. *Synflorescences* dense, spicate, axillary and terminal clusters (Figure 2A, C). *Male plants*: capitula homogamous discoid, 7–12 mm diam., 15–80-flowered, sessile. *Involucral bracts* densely hairy, free, in \pm 3 rows, imbricate; outer ovate, acute to acuminate, up to 7 \times 5 mm; middle row ovate, acute or obovate, 4 \times 3 mm; inner row linear, 5 \times 0.5 mm. *Corolla* infundibuliform, hairy and glandular; tube 5–6 mm long; lobes 5, 1.5–2.0 mm long, recurved, papillate. *Anthers* exerted, with ovate apical appendage, calcarate, caudate, tails \pm 1 mm long, branched; filaments 1.5 mm long. *Style* up to 6 mm long, well exerted, undivided or with 2 very small lobes, papillate. *Ovary* narrowly oblong, sterile, with long, septate hairs. *Female plants*: capitula homogamous discoid, 6–10 mm diam., 1–11-flowered, sessile or peduncle up to 3 mm long. *Involucral bracts* densely hairy, free, in 2 or 3 rows;

outer ovate, acute or obovate, obtuse, 4–7 mm long; middle row obovate, obtuse or acute, 5–7 mm long; inner row oblanceolate, 4–7 mm long. *Corolla* infundibuliform, hairy and glandular; tube 1.5–2.0 mm long; lobes 5, 1.0–1.5 mm long, papillate, recurved. *Style* well exerted, 4 mm long, with 2 broad, 0.5–1.0 mm long lobes. *Ovary* elliptic, 3–4 mm long, glandular and septate-hairy. *Cypselae* enveloped by long, white, silky, septate hairs. *Pappus* absent. *Flowering time*: August to December with a peak from September to December (spring to early summer).

Distribution and habitat: *Tarchonanthus minor* occurs in the Free State, Lesotho, Northern, Western and Eastern Cape on hillslopes, mountainsides, rocky ridges and hills (Figure 4).

Vernacular names: small-leaf camphor bush, *kleinblaarkanferbos* (Afrikaans) are here proposed.

Notes: 1) Lessing described *T. minor* in 1832 but cited no specimen (see also Pope 1992); neither did De Candolle (1836), but only referred to Lessing's description. Beentje (1999) stated that the plants Lessing saw, were destroyed at B. Harvey (1865) cited a few specimens. I chose *Smith 942* as neotype as Smith made a note on his specimen: 'Agrees in shape and size of leaves with *Cooper 708* cited by Harvey in *Flora capensis* 3: 118 under *T. minor* Less., but *Cooper* specimen is barren'.

2) The name 'minor' has been misapplied to almost all species of *Tarchonanthus* recognized here. *Tarchonanthus minor* is distinguished from the other species by the small, narrowly elliptic, entire leaves, dense, spicate synflorescences and flowering time in spring and summer. The leaves in some of the Lesotho specimens reach the upper limit of the range in leaf size.

2. ***Tarchonanthus littoralis* P.P.J.Herman**, sp. nov., *T. camphoratus* L. affinis sed folia magna, oblanceolata, elliptica ad anguste elliptica, raro obovata, (32–)40–140 \times 10–45 mm, bicoloria, supra atrovirentia,

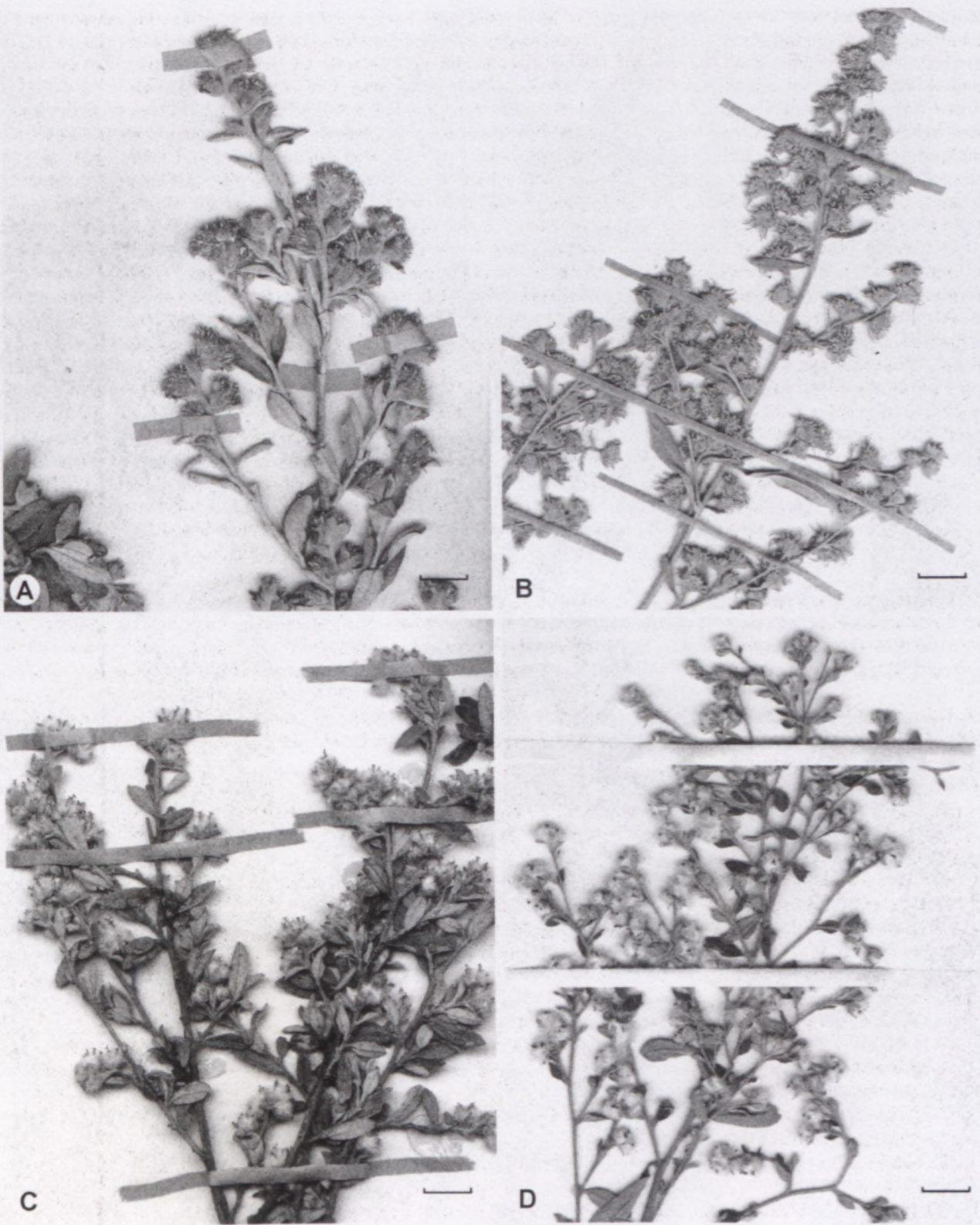


FIGURE 2.—Synflorescences of *Tarchonanthus* species. A, dense, spicate male synflorescences of *T. minor*, Galpin 13954 (PRE); B, paniculate male synflorescences of *T. camphoratus*, Story 1057 (PRE); C, dense, spicate female synflorescences of *T. minor*, Liebenberg 7377 (PRE); D, paniculate female synflorescences of *T. parvicapitulatus*, Botha 2660 (PRE). Scale bars: 10 mm.

infra albida; margine integra vel plerumque apicem versus leviter denticulato; petiolus 5–8(–12) mm longus; cypselis pilis involvens albidis; plerumque littora incolens.

TYPE.—South Africa, [KwaZulu-]Natal, 3030 Port

Shepstone, Uvongo, Deppe's road, (–CB), 10 March 1970, Strey 9713 (PRE, holo!).

Dioecious shrubs or trees, 1–8 m high. Leaves aromatic, alternate, large, oblanceolate, elliptic to narrowly elliptic, rarely obovate (Figure 3B, C), (32–)40–140 ×

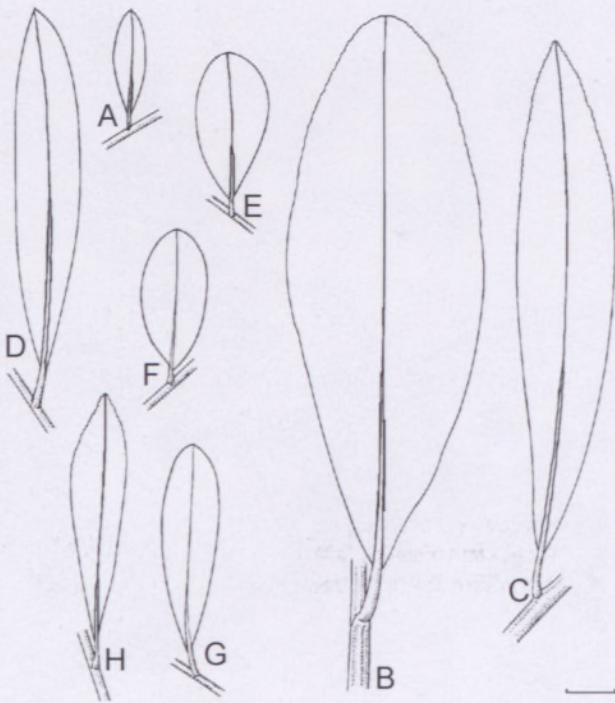


FIGURE 3.—Leaf shapes of *Tarchonanthus* species. A, small, narrowly elliptic, entire leaf of *T. minor*, Braack 22 (PRE). B, C, *Tarchonanthus littoralis*: B, large, narrowly elliptic leaf, O'Callaghan, Fellingham & Van Wyk 186 (PRE); C, oblanceolate leaf with denticulate margins, Osborne 18 (PRE). D, narrowly elliptic, entire leaf of *T. camphoratus*, Germishuizen 369 (PRE). E, F, *Tarchonanthus obovatus*: E, obovate, entire leaf, Gubb 1562 (KMG); F, elliptic, entire leaf, Gubb 1519 (KMG). G, H, *Tarchonanthus parvicapitulatus*: G, oblanceolate, obtuse leaf with entire margins, Mogg PRE43479 (PRE); H, oblanceolate, obtuse-mucronate leaf with denticulate margins, Compton 27888 (PRE). Scale bar: 10 mm. Drawn by G. Condy.

10–45 mm, discolorous, upper surface bright or dark green, hairy when young, becoming glabrous, reticulate, with glands on margins of reticulations, main vein sunken and hairy, especially in lower half, lower surface densely white-hairy, main and secondary veins conspicuous; apex obtuse to acute, sometimes with curved mucro subapically; base cuneate; margin very often faintly denticulate in upper part, rarely entire. *Petiole* 5–8(–12) mm long. *Synflorescences* terminal, paniculate. *Male plants*: capitula homogamous discoid, 5–10 mm diam., 13–47-flowered; peduncle 2–12 mm long. *Involucral bracts* densely hairy, fused halfway, 5-lobed; tube 1.5–3.0 mm long; lobes 1.5–2.0 mm long; sometimes with few free, inner bracts. *Corolla* infundibuliform, glandular and hairy; tube 2.0–3.5 mm long; lobes 5, 1.0–1.5 mm long, papillate, recurved. *Anthers* 1.0–1.5 mm, exserted, with ovate-triangular, apical appendage, calcarate, caudate, tails ± 0.5 mm long, branched; filaments 1.5–3.0 mm long. *Style* well exserted, 5–8 mm long, undivided or with 2 small lobes, papillate. *Ovary* rod-like, 0.5–1.0 mm long, glandular, sterile, septate-hairy. *Female plants*: capitula homogamous discoid, ± 5 mm diam., mostly 3(–6)-flowered; peduncle 0–4 mm long. *Involucral bracts* free, 3–6 mm long, in 2 or 3 rows; outer bracts ovate or narrowly lanceolate-ovate, acute; inner elliptic. *Corolla* infundibuliform, glandular and hairy; tube 1.5–2.0 mm long; lobes 5(6), 0.5–1.0 mm long, papillate, recurved. *Style* exserted, 2.5–3.5 mm

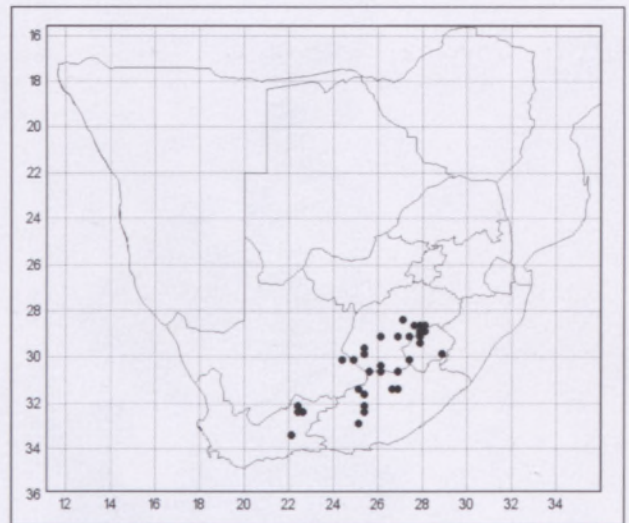


FIGURE 4.—Distribution of *T. minor* in southern Africa based on material at PRE.

long, with 2 short branches, ± 1 mm long. *Ovary* elliptic to obovate, 2.5–4.0 mm long, densely septate-hairy and glandular. *Cypsela* obovate to elliptic, ribbed, 3–5 mm long, densely, white, septate-hairy and glandular. *Pappus* absent. *Flowering time*: December to July with a peak from February to March (July) (late summer).

Distribution and habitat: *Tarchonanthus littoralis* occurs from southern KwaZulu-Natal to Eastern and Western Cape along the coast, on hillsides, littoral dunes and river banks (Figure 5).

Vernacular names: coastal camphor bush, *kuskanferbos* (Afrikaans), are here proposed.

Tarchonanthus littoralis is distinguished by the usually large, oblanceolate to elliptic or narrowly elliptic, dark green leaves with mostly denticulate upper margins and long petiole. The cypsela-containing capitula are rather

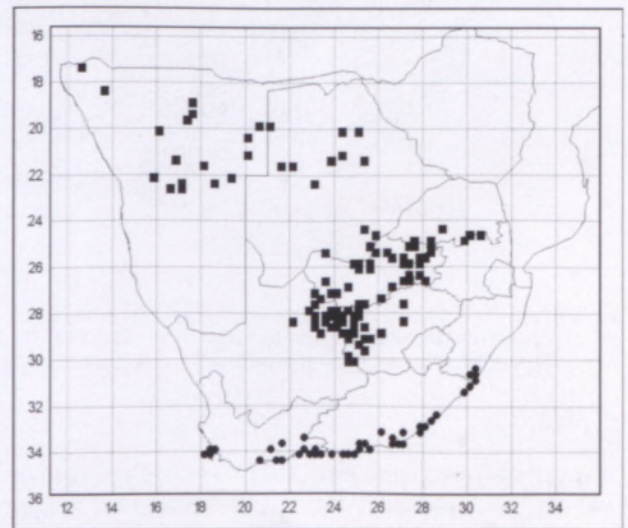


FIGURE 5.—Distribution in southern Africa of *T. littoralis*, ●, based on material at PRE; and *T. camphoratus*, ■, based on material at KMG and PRE.

large. This is probably the species described and illustrated by Von Breitenbach (1974) under *T. camphoratus*. It has often been confused with *Brachylaena* species.

3. ***Tarchonanthus camphoratus* L.**, sens. str., Species plantarum: 842 (1753); Less.: 208 (1832); DC.: 431 (1836); Harv.: 118 (1865); Merxm.: 176 (1967); Paiva: 360 (1972); Compton: 622 (1976); Hilliard: 111 (1977); Pope: 9 (1992); Beentje: 82 (1999). Type: 'Aethiopia', in this case South Africa; Hort. Cliff. has 'Cap. Bon. Sp.' (*Herb. Cliff.* 398, *Tarchonanthus no.1*, BM, lectotype chosen by Anderberg in Jarvis et al. 1993: 92, see Beentje 1999–PRE, photo.!).

T. litakunensis DC.: 431 (1836); excluding lectotype chosen by Beentje (1999), here placed under *T. littoralis*. Lectotype: Burchell 2202 (G-DC, here designated–PRE, photo.!).

T. camphoratus L. var. *litakunensis* (DC.) Harv.: 118 (1865).

Mostly a multi-stemmed, rounded dioecious shrub, rarely a tree, 1–8 m high. *Leaves* aromatic, alternate, narrowly elliptic to slightly oblanceolate (Figure 3D), (20–)26–80 × 7–20 mm, discolorous, upper surface grey-green or khaki-green, hairy when young, becoming glabrous, reticulate, with glands on margins of reticulations, main vein sunken, hairy in lower part, lower surface densely grey- or greenish hairy, main and secondary veins prominent, tertiary veins reticulate; apex acute, often mucronate, sometimes obtuse; base cuneate; margin entire. *Petiole* up to 5 mm long. *Synflorescences* terminal, paniculate (Figure 2B). *Male plants*: capitula homogamous discoid, 3.0–11.5 mm diam., 10–60-flowered; peduncle 0–10 mm long. *Involucral bracts* fused halfway, 5(–7)-lobed; tube 1.5–5.0 mm long; lobes 1.0–2.5 mm long, sometimes with a few free bracts on inside. *Corolla* infundibuliform, glandular and hairy; tube 1.5–3.5 mm long; lobes 5, 0.5–1.0 mm long, papillate, recurved. *Anthers* well exerted, 1.0–1.5 mm long, with small, ovate, apical appendage, calcarate, caudate, tails up to 0.5 mm long, branched; filaments 2–3 mm long. *Style* well exerted, 4–8 mm long, undivided or rarely with 2 small lobes, papillate. *Ovary* rod-like, 0.5–1.0 mm, sterile, septate-hairy. *Female plants*: capitula homogamous discoid, 3.5–7.0 mm diam., (1–)3(–5)-flowered; peduncle 0–6 mm long. *Involucral bracts* densely hairy, in 2 or 3 rows, free, imbricate, 3–6 mm long; outer bracts linear-lanceolate to linear-obovate; middle and inner row ovate. *Corolla* infundibuliform, hairy and glandular; tube 1.0–1.5 mm long; lobes 5, 0.5 mm long, papillate. *Staminodes* sometimes present. *Style* exerted, 1.5–3.0 mm long, with 2 broad, 0.5 mm long lobes. *Ovary* elliptic to obovate, 1–4 mm long, densely septate-hairy and glandular. *Cypselas* elliptic, ribbed, 3–4 mm long, creamy or yellowish, densely septate-hairy and glandular. *Pappus* absent. *Flowering time*: March to August with a peak from March to July (autumn to winter).

Distribution and habitat: *Tarchonanthus camphoratus* is widely distributed in the northern part of southern Africa from Namibia, Botswana, the Northern Province, North-West, Gauteng, Free State and Northern Cape (Figure 5). It also occurs in tropical and North Africa and the Arabian Peninsula. It occurs in a variety of habitats and soil types, e.g. savanna, bushveld, woodland, grass-

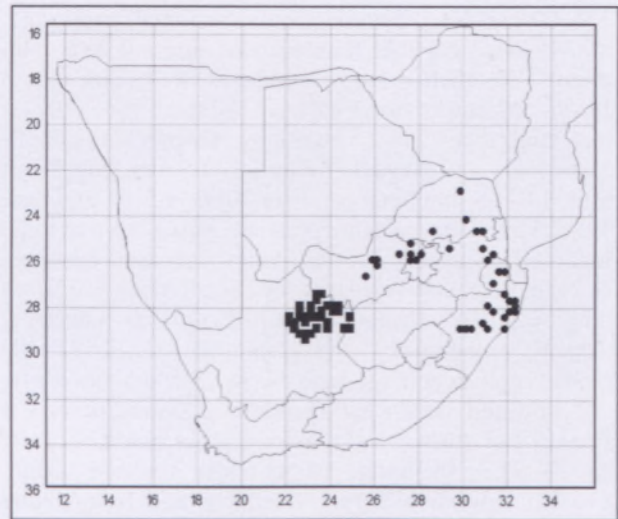


FIGURE 6.—Distribution in southern Africa of *T. obovatus*, ■, based on material at KMG and PRE; and *T. parvicapitulatus*, ●, based on material at PRE.

land, on flats, rocky hills, mountain slopes and hillsides, riverbanks on sandy, loamy, gravelly, calcrete, quartzite and dolomitic soils.

Vernacular names: camphor bush, *kanferbos* (Afrikaans) as listed by De Winter et al. (1978) is proposed for *T. camphoratus* sens. str.

Notes: 1) It is very unfortunate that Beentje (1999) chose *Drège 5041* as lectotype for *T. litakunensis*. 'Litakun' (Takoon 2723BB) is a small settlement near Kuruman (Burchell 1824; Leistner & Morris 1976) in the North-West. However, *T. littoralis* always grows near the sea and the specimen chosen by Beentje (*Drège 5041*) was collected near the sea. This specimen (*Drège 5041*) also conforms to the description of *T. littoralis* presented here. It is therefore proposed that *Drège 5041* be rejected as lectotype of *T. litakunensis*.

2) This is the most common taxon of the genus in the northern parts of southern Africa. It can be distinguished by the narrowly elliptic to slightly oblanceolate, entire leaves with a grey-green or khaki-green colour and the cypselas enveloped by yellowish cottony hairs. Not browsed by stock (Burchell 1824) except as a last resort in times of drought [A. Gubb pers. comm., *Speedy 11/22* (PRE)].

4. ***Tarchonanthus obovatus* DC.**, Prodrômus 5: 431 (1836), Herman & Condy: 108, t. 2180 (2001). Type: South Africa, Bechuanaland Division (?Northern Cape), Klipfontein, Burchell 2155 (G-DC, holo.; K!–PRE, photo.!).

Mostly a single-stemmed dioecious tree or rarely a shrub, up to 2 m high. *Leaves* aromatic, alternate, obovate or elliptic (Figure 3E, F), 12–32(–37) × 7–17 mm, discolorous, upper surface bright green, hairy when young, becoming glabrous, reticulate, glandular in reticulations, main vein sunken and hairy in lower part, lower surface densely whitish pubescent, main and secondary veins prominent, minor veins forming a reticulation; apex obtuse or acute; base cuneate; margin entire. *Petiole*

1.0–4.0 mm long. *Synflorescences* terminal, paniculate. *Male plants*: capitula homogamous discoid, 8–11 mm diam., 20–40-flowered; peduncle 0–7 mm long. *Involucral bracts* fused halfway, 5-lobed; tube 2.0–2.5 mm long; lobes 2.0–2.5 mm long. *Corolla* infundibuliform, hairy and glandular; tube 1.5–2.5 mm long; lobes 5(6), 1.0–1.5 mm long, papillate. *Anthers* 5(6), exserted, 1.0–1.5 mm long, calcarate, caudate, tails \pm 0.5 mm long, branched; filaments 2–3 mm long. *Style* well exserted, 6–7 mm long, undivided or with 2 small lobes, \pm 0.5 mm long, papillate. *Ovary* rod-shaped, 0.5–1.0 mm long, densely septate-hairy and glandular, sterile. *Female plants*: capitula homogamous discoid, 3.5–4.5 mm diam., 2–5-flowered; peduncle 0–7 mm long. *Involucral bracts* free, in 2 or 3 rows, 3–6 mm long; outer bracts obovate, acute; inner spatulate or narrowly obovate, acute. *Corolla* infundibuliform, glandular and hairy; tube 0.5–1.0 mm long; lobes 5(6), \pm 0.5 mm long, apex papillate. *Style* exserted, 1.0–2.0 mm long; style branches 0.5 mm long. *Ovary* obovate, 2–3 mm long, glandular and septate-hairy. *Cypselas* brown, obovate, ribbed, 2.5–5.0 mm long, glandular and pure white, septate-hairy. *Pappus* absent. *Flowering time*: March to May (autumn to early winter).

Distribution and habitat: *Tarchonanthus obovatus* is restricted to Northern Cape where it occurs on hillsides, rocky outcrops or flats often on an ironstone or limestone base in sandy soils (Figure 6).

Vernacular names: *Gordonia* camphor tree, *Gordonia-kanferboom* (Afrikaans), was proposed for this taxon (Herman & Condy 2001). It is known by farmers in that region as *olienvaalbos* (Afrikaans) (A. Gubb pers. comm.), but *vaalbos* refers to *Brachylaena* species (De Winter et al. 1978).

Note: it is interesting that, since the description, the name *T. obovatus* has never been used. This species is recognized by the obovate or elliptic, entire leaves and the cypselas that are enveloped by pure white, cottony hairs in contrast to *T. camphoratus*, occurring in the same area, which have yellowish hairs enveloping the cypselas. Readily browsed by both game and domestic stock all year round (A. Gubb pers. comm.).

5. *Tarchonanthus parvicapitulatus* P.P.J.Herman, sp. nov., *T. camphoratus* L. affinis sed folia oblanceolata, raro obovata, (22–)25–60(–70) mm, margine integra vel plerumque apicem versus leviter denticulato; capitula parva; synflorescentia laxa.

TYPE.—South Africa, Transvaal [Mpumalanga], 2531 Komatipoort, Barberton, (–CC), lower hill slopes, April 1890, Galpin 952 (female plant) (PRE, holo.!).

Dioecious shrub or small, multi-stemmed tree, up to 8 m high. *Leaves* aromatic, alternate, oblanceolate or rarely obovate (Figure 3G, H), (22–)25–60(–70) \times 7–16 mm, discolourous, upper surface pale, dark green, hairy when young, becoming glabrous, glandular in reticulations, midrib sunken and hairy in lower part, lower surface densely whitish hairy, main and secondary veins prominent; apex obtuse to obtuse-mucronate, sometimes acute; base cuneate; margin often faintly denticulate in upper

part, rarely entire. *Petiole* 1.5–5.0 mm long. *Synflorescences* terminal, paniculate (Figure 2D). *Male plants*: capitula homogamous discoid, 5–9 mm diam., 10–30-flowered; peduncle 0–7 mm long. *Involucral bracts* fused halfway, 5-lobed; tube 1–2 mm long; lobes 1.0–1.5 mm long. *Corolla* infundibuliform, glandular and hairy; tube 1.5–2.0 mm long; lobes 5, 1.0–1.5 mm long, apex papillate. *Anthers* 5, exserted, 1.0–1.5 mm long, calcarate, caudate, tails 0.5 mm long, branched; filaments 2–3 mm long. *Style* well exserted, 4.0–5.5 mm long, entire or with 2 small lobes. *Ovary* rod-shaped, 0.5 mm long, sterile, septate-hairy. *Female plants*: capitula homogamous discoid, 3–4 mm diam., 1–3-flowered; peduncle mostly absent or up to 5 mm long. *Involucral bracts* free, 2–5 mm long, in 2 or 3 rows, narrowly lanceolate, narrowly ovate or elliptic, acute. *Corolla* infundibuliform, glandular and hairy; tube 0.5–1.0 mm long; lobes (4)5, 0.5–1.0 mm long, papillate. *Style* exserted, 1–2 mm long, lobes 2, 0.5 mm long. *Ovary* obovate to elliptic, 1.5–3.5 mm long, glandular and septate-hairy. *Cypselas* pale or dark brown, obovate, ribbed, 1.5–3.0 mm long, glandular and pure white, septate-hairy. *Pappus* absent. *Flowering time*: March to October with a peak from April to June (autumn to winter).

Distribution and habitat: *Tarchonanthus parvicapitulatus* occurs in Namibia(?), Northern Province, the North-West, Gauteng, Mpumalanga, Swaziland, KwaZulu-Natal and Eastern Cape (only 2 records) (Figure 6). It is also found in Zimbabwe (cf. *Borle 157, Sim 19129, Miller 1776, Ngoni 370, Wild 1048*). It grows in forest, valleys and bushveld on mountain slopes, hills and river banks.

Vernacular names: small-head camphor bush, *kleinhofiekanferbos* (Afrikaans) are here proposed.

Note: this species is recognized by the oblanceolate, obtuse-mucronate leaves mostly with denticulate margins towards the apex. The synflorescences tend to be more open and the capitula are smaller than in the other species. This is probably the species referred to by Moll (1992) under *T. camphoratus*.

SPECIMENS EXAMINED

f, female; m, male.

Acocks 535 (3) (f & m), *543* (3) (f) PRE: *2109* (4) (f), *2117* (3) (m), *2344*, *2351*, *2352* (3) (f) KMG, PRE: *8617*, *8627* (2) (f), *13010* (5) (m) PRE: *KMG11730* (2) (f) KMG. *Alexander PRE43490* (2) (f & m) PRE. *Allen 131* (3) (m) PRE. *E.R. Anderson J.14* (3) (m) PRE. *J. Anderson 58* (1) (f & m) PRE. *J.R. Anderson ORFS233* (1) (m) PRE. *Archibald 3595* (2) (f) PRE.

M. Badenhorst 509 (3) (m) KMG. *P.J. Badenhorst 40*, *104* (3) (f) KMG, PRE. *Balsinhas & Kersberg 1948* (3) (f) PRE. *N. Barker 886* (5) (m) PRE. *N.P. Barker 621* (3) (m) PRE. *Capt. Barrett-Hamilton TRV6408* (3) (f) PRE. *Basson 14* (3) (f) PRE. *Bayliss BRI.B.351* (3), *BRI.B.6249* (2), *BS8416* (2) (m) PRE. *Bengis 447* (1) (f) PRE. *Biggs 222* (5) (m) PRE. *Boddam-Whetham 60* (1) (f) PRE. *Bosch 154* (4) (f) KMG. *Botha 2559* (3) (f), *2660* (5) (f), *3067* (2) (m) PRE. *Braack 22* (1) (m) PRE. *Bradfield 250* (3) (m) PRE. *Britten 33*, *736* (2) (f) PRE. *A. Brueckner 845* (3) (m) KMG, PRE. *Burchell 2155* (4) (f & m) K. *2691* (1) (sterile) K. *Burrows 2102* (1) (m), *2286* (1) (f) PRE. *Burt Davy 148*, *10741*, *13933* (3) (f), *317* (5) (m), *7865* (2) (f), *9531*, *10375*, *13820* (3) (m) PRE.

Codd 1166 (5) (f), 1169, 1935 (5) (m), 1283 (4) (f), 1283 (3) (m) PRE. *Collett* 510 (3) (m) PRE. *E. Collins* PRE43484 (5) (m) PRE. *S. Collins* 12 (3) (m) PRE. *Comins* 1053 (2) (f) PRE. *Compton* 26015, 27888, 28810, 32132 (5) (f), 28947 (5) (m) PRE. *E.O. Cooke* 6271 (3) (m) KMG. *O.L. Cooke* 4265 (4) (m) KMG, 6266 collected 4/1940 (4) (m) PRE, 6266 collected 4/1942 (4) (m), 6267 collected 4/1942 (4) (f) KMG. *Culverwell* 23 (5) (m) PRE.

Dahlstrand 420 (2) (f) PRE. *Davies, Thompson & Miller* 8, 89 (3) (f) PRE. *De Souza* 441 (5) (m) PRE. *De Villiers* PRE43498 (3) (f & m) PRE. *De Winter* 2834, 3520 (5) (m), 9256 (2) (f) PRE. *De Winter & Leistner* 5636 (3) (f) PRE. *Dieterlen* 565 (1) (m) PRE. *Dinter* 4723 (3) (m) PRE. *Dix* 211 (2) (m) PRE. *Downing* 560 (5) (m) PRE. *Dregé s.n.* (5041) (2) (f) K; PRE9727 (2) (f) PRE. *Du Preez & Steenkamp* 114 (3) (f) PRE.

Ecklon & Zeyher 112.11 (1) (m) PRE. *D. Edwards* 2062 (5) (f), 2505 (5) (m), 4413 (3) (f) PRE. *H.W.G. Edwards* 52 (5) (f) PRE. *C. Evrard* 9276 (3) (f) PRE.

Farquharson A1483 (2) (f) PRE. *Feely* 32 (5) (m) PRE. *Fellingham* 963 (2) (f) PRE. *Flanagan* 192 (2) (f & m), 350 (2) (f), 1551 (1) (f), 2330 (5) (m) PRE. *Fourie* ORFS174 (1) (m) PRE.

Galpin 952 (5) (f & m), 7008 (3) (f), 13954 (1) (m), 133127 (5) (f), M184 (3) (m) PRE. *Gane* 268 (2) (f) PRE. *Germishuizen* 369 (3) (f & m), 387 (5) (f) PRE. *Gerrard* 1022 (2) (m) K (mounted with type). *Gerstner* 593 (5) (m), 659 (5) (f) PRE. *Giess* 11693 (3) (f) PRE. *Gilfillan Herb.* *Galpin* 5533 (1) (m) PRE. *Gillett* 3434 (2) (m) PRE. *Glen* 2761 (5) (f) PRE. *Goldblatt* 1424 (2) (f & m), 8013 (2) (f) PRE. *Goossens* 710 (1) (f), 1673 (3) (f) PRE. *Gubb* 16 (4) (f), 18 (3) (m) KMG; 168-1, 219/1, 260-84, 272-2 (4) (f) PRE; 341 (3) (m & f), 342, 343 (3) (f), 344 (4) (f), 345, 346 (3) (f), 347 (3) (m), 349 (3) (m & f), 350 (3) (f), 351 (4) (m), 352, 353, 355 (4) (f), 1088 (3) (m), 1097 (4) (f), 1328, 1439 (4) (m), 1507 (4) (f), 1513 (4) (m), 1519, 1530 (4) (f), 1562, 1703 (4) (m), 1727 (3) (m), 2105 (4) (m), 2221, 2222 (3) (f), 2243 (4) (f), 3603 (3) (m), 4361, 6002, 6516 (4) (f), 7442 (3) (m), 8118, 13680, 14303, 16125, 16127 (4) (f), 16128 (4) (m), 16130 (3) (m), 16131 (3) (f) KMG.

Hansen 3141 (3) (f) PRE. *Henrici* 4708 (1) (m) PRE. *Herbert* 29 (4) (m) KMG. *Herman* 654 (3) (m), 1523 (4) (m), 1524 (4) (f) PRE. *Humbert* 9537 (2) (f) PRE.

Jacobsen 2929 (3) (m) PRE. *Jacot-Guillarmod* 592 (1) (f), 9920 (2) (m) PRE. *Jarman* 82 (1) (m) PRE. *Joffe* 831, 942 (2) (f), J1 (3) (f) PRE. *Jooste* 104 (3) (m), 123 (3) (f), 216 (1) (f) PRE. *M. Jordaan* 1135 (5) (f) PRE. *P. Jordaan* CBK9 (3) (f) PRE.

Killick 4304 (1) (f) PRE. *King* 69 (5) (f) PRE. *Kotze* 43 (5) (m), 44 (5) (f) PRE.

Lang TRV31709 (3) (f) PRE. *Leach & Bayliss* 12920, 12962 (3) (f) PRE. *Leendertz* 1136, 2142, TRV11245 (3) (f) PRE. *Leighton* 3112 (2) (m) PRE. *Leistner* 495 (1) (m) PRE. *Le Roux* 366 (3) (f) PRE. *Letty* 223 (2) (f) PRE. *L.C.C. Liebenberg* 4480 (3) (f), 7377 (1) (f), 8078 (2) (m) PRE. *Liebenberg* S.78, S.84 (3) (m) PRE. *Louw* 234 (3) (m) PRE.

MacDevette 252 (2) (f) PRE. *Macdonald* 76/24, 77/148 (3) (f) KMG. PRE. *MacMurray* 5942 (3) (m), 5943 (3) (f) KMG; 5980 (4) (f) KMG. PRE. *Marais* 1137 (2) (f) PRE. *Marloth* 557 (2) (f & m), 1009, 1329 (3) (m), 5056, 12750 (3) (f) PRE. *Mbedzi* 1561 (5) (f) PRE. *McCleane* 265 (2) (f) PRE. *McDonald* 77/121 (4) (f), 77/122 (4) (m) KMG. PRE. *McGregor Museum* 5980 (4) (f) PRE. *McMurtry* 2432 (5) (m) PRE. *Miller B/202* (3) (f) PRE. *Moffett* 605 (1) (f) PRE. *Mogg* 4788, 13209 (2) (f), 7925 (3) (f & m), 8517 (3) (m), 16922 (3) (f), PRE43479 (5) (f) PRE. *Moore* 11 (3) (f) PRE. *Morze* 2005 (2) (f) PRE. *Mott* 985 (3) (f) PRE. *Muir* 132 (2) (f) PRE. *Muller* 1206, 1505 (3) (f) PRE. *Munro P.S.11* (2) (f), PRE2909 (5) (m) PRE. *Murray* 634 (3) (f) PRE.

Nelson 29 TRV11384 (3) (f) PRE.

Oates 312 (3) (m) PRE. *O'Callaghan, Fellingham & Van Wyk* 31, 186 (2) (f) PRE. *Osborne* 18 (2) (m) PRE. *Owens* 99, 104 (3) (f) PRE.

Pagan 1729a (3) (f) KMG. *Paterson* 1001, TRV12337 (2) (f) PRE. *Pearson* 1610 (3) (m) PRE. *Peeters, Gericke & Burelli* 4 (3) (f) PRE. *Phalaise* 17 (3) (m) PRE. *Phelan* 1048 (3) (f) PRE. *J. Phillips* 1175, 1370 (3) (m) PRE. *J.F.V. Phillips For.Herb.* 350 (2) (f) PRE. *Pillans* 3492 (2) (m) PRE. *Pole Evans* 1260, 2226 (3) (m), 2495, 2495(42) (4) (f), 2496, 2496(43) (4) (m), 3594 (5) (f), H.15695 (3) (f), H.18041 (2) (m) PRE. *Pole Evans & Smith* 1859 (1) (f) PRE. *Potter ex Henrici* 2030 (1) (m), 2031 (1) (f) PRE. *Poynton For.Herb.* 11990 (2) (f) PRE. *Prior* PRE43495 (2) (f & m) PRE. *Prosser* 1844 (3) (f) PRE.

Rauh & Schlieben 9644 (3) (f) PRE. *Rehm* PRE43513 (1) (f) PRE. *Repton* 616 (3) (f & m), 4525, 4562 (5) (f) PRE. *Roberts* 5379 (1) (m) PRE. *Rodin* 2122 (3) (f), 3062 (2) (m) PRE. *Rogers* 24097 (5) (f), 26851 (2) (f), TRV22185 (5) (f) PRE. *Romanowski* 6 (2) (f) PRE. *Rose-Innes* 86 (5) (f) PRE. *Ross* 2117 (5) (f) PRE. *Rossouw* TRV26142 (3) (f) PRE. *Rowland, Sealt, Steyn* PRE26464 (4) (f) PRE. *Rudatis* 1646 (2) (f) PRE.

Scharf 1140 (2) (m), 1393, 1419 (2) (f) PRE. *Scheepers* 1596 (3) (f) PRE. *Schlieben* 8749 (3) (f) PRE. *B. Schmidt* 15 (3) (f) PRE. *E. Schmidt* 330 (3) (m) PRE. *Schmitz* 6850, 6851 (1) (m), 9262 (1) (f) PRE. *Schonland* 1628 (3) (f) PRE. *Shearing* 1204 (1) (f) PRE. *Silk* 264 (3) (f) KMG. *Sim* 2101, 20429 (2) (f) PRE. *C.A. Smith* 440A, 440B, 942 (1) (f), 4417 (3) (f & m), 4502 (3) (f), 5452 (1) (f) PRE. *P.A. Smith* 2591 (3) (f) PRE. *Smuts* 1417 (3) (f) PRE. *(Mrs) J.C. Smuts* PRE43492 (2) (f) PRE. *Smyth* PRE43528 (2) (f) KMG. PRE. *South* 671 (2) (m) PRE. *Speedy* 1122 (3) (m) PRE. *Stalmans* 621 (5) (f) PRE. *Story* 101, 137 (1) (f), 1057 (3) (m), 1190 (4) (f), 4585, 4635, 4877, 4981, 5277 (3) (f) PRE. *Strey* 3288 (5) (f), 6536 (2) (m), 7660a, 8825, 9713 (2) (f), 9709 (2) (m), 9757 (5) (m) PRE. *Sutton* 880 (5) (f), 1293 (3) (f) PRE.

Taylor 7111 (3) (m), 10219 (2) (f) PRE. *Theiler* TRV12362 (5) (f) PRE. *G.C. Theron* 345 (1) (m), 815 (3) (f) PRE. *G.K. Theron* 1429 (5) (f) PRE. *J.J. Theron* 636 (3) (m) PRE. *Thode* 2801 (5) (f), A527 (1) (f), A861 (2) (m), A2479 (2) (f) PRE. *Thorne* PRE45409 (3) (f) PRE. *Tyson* PRE3102, *Herb.Marl.* 8541 (2) (m) PRE.

Van Breda 1147 (2) (f) PRE. *Van Dam* TRV18856 (2) (f) PRE. *Van der Schijff* 6733, 8026 (3) (f) PRE. *Van der Spuy* 59 (3) (f) PRE. *Van Eck* 1 (3) (m), 2 (4) (f) PRE. *Van Hoepen* 1846 (4) (f) PRE. *Van Son* TRV28805 (3) (m), TRV28806 (3) (f), TRV31769 (3) (m) PRE. *A.E. van Wyk* 1842 (2) (f) PRE. *P. van Wyk* BSA118 (3) (f), BSA992 (5) (f) PRE. *Van Zinderen-Bakker* 97 (3) (f), 997 (3) (m), 1063 (1) (f) PRE. *F. Venter* 933 (2) (f), 2006 (3) (m) PRE. *H.J.T. Venter* 3749 (5) (m), 3750 (5) (f) PRE. *Verdoorn* 1002 (1) (f), 1590 (1) (m), 1761 (3) (f), 1762 (3) (m), PRE30042 (5) (f) PRE. *Victor* 347 (2) (f), 1452 (1) (f) PRE. *A. Viljoen* 69 (2) (f) PRE. *G. Viljoen* 56 (5) (m) PRE. *Viviers* 167 (2) (m) PRE.

Ward 1402, 2612, 7719 (5) (f), 2611, 2613, 7718 (5) (m) PRE. *Walsh* PRE61373 (2) (f) PRE. *Werdermann & Oberdieck* 1578 (1) (m) PRE. *West* 1230 (5) (f), 1804 (5) (m) PRE. *White* 5101 (2) (f), 10509 (5) (m) PRE. *Williamson* 274 (5) (f) PRE. *Wilman* 1244, PRE43493 (3) (m) PRE; 1728, KMG11733 (4) (m), 3319, 5990b, 6527 (3) (f) KMG; 5979, 5990, 6268, 6269 (3) (f) KMG. PRE. *Wirminghaus* 289 (2) (f) PRE. *Wood Herb.* Galpin3229 (2) (m) PRE.

Zambatis 669 (5) (f) PRE. *Zeyher* 819 (2) (m) PRE.

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