
A New Species of *Pavetta* (Rubiaceae) from South Africa

Stefan J. Siebert

A. P. Goossens Herbarium, School of Environmental Sciences and Development, North-West University, Private Bag X6001, Potchefstroom 2520, South Africa.

Corresponding author: stefan.siebert@nwu.ac.za

Elizabeth Retief

National Herbarium, South African National Biodiversity Institute, Private Bag X101, Pretoria 0001, South Africa. E.Retief@sanbi.org.za

Abraham E. van Wyk

H. G. W. J. Schweickerdt Herbarium, Department of Plant Science, University of Pretoria, Pretoria 0002, South Africa. braam.vanwyk@up.ac.za

ABSTRACT. *Pavetta glaucophylla* Retief, S. J. Siebert & A. E. van Wyk, a new species of the Rubiaceae (Ixoroideae) from South Africa, is described and illustrated. A member of *Pavetta* L. subg. *Pavetta*, it has a restricted range and is near endemic to the Sekhukhuneland Centre of Endemism. Hitherto *P. glaucophylla* has mainly been confused with *P. zeyheri* Sond., from which it differs in being a taller plant with larger, blue-green leaves in living condition instead of dark green to gray-green leaves and flowers in which the calyx lobes are 0.5–0.75 mm long and triangular-ovate, and 1.25–2 mm long and not triangular-lanceolate, as in *P. zeyheri*.

Key words: IUCN Red List, *Pavetta*, Rubiaceae, Sekhukhuneland, South Africa.

The rubiaceous genus *Pavetta* L. belongs to subfamily Ixoroideae, tribe Pavetteae, and comprises ca. 400 species from the Old World tropics, excluding Madagascar (Retief & Leistner, 2000; Bridson, 2003). Sub-Saharan Africa is a center of diversity for the genus, with 21 described species known from South Africa, all restricted to the summer rainfall area (Germishuizen et al., 2006). Although not as diverse as it is further north in Africa, *Pavetta* is the largest of the 53 genera of Rubiaceae native to South Africa (Germishuizen et al., 2006). Members of *Pavetta* are trees, shrubs, or dwarf shrubs (geoxylic suffrutices), and the majority are, among others, readily distinguished from most other woody Rubiaceae by the presence of symbiotic bacterial nodules in the leaf blades (Bridson, 2003). The genus is further characterized by stipules partly to completely connate, mostly long-acuminate to awned; terminal, umbellate inflorescences with numerous fragrant, tetramerous flowers with secondary pollen presenta-

tion (on style), usually white, contorted corolla lobes, and a style at least twice as long as the corolla (Retief & Leistner, 2000). The calyx limbs of *Pavetta* have four distinct lobes, and the fruit are fleshy, 2-seeded, and indehiscent (Retief & Leistner, 2000). Even though general floral morphology is very similar in *Pavetta*, the calyx is quite variable and provides some of the best criteria for the infrageneric classification of the group (Bremekamp, 1929; Bridson, 2003).

In southern Africa a number of *Pavetta* species with restricted range are known from recognized centers of floristic endemism (van Wyk & Smith, 2001), for example, *P. tshikondeni* N. Hahn from the Soutpansberg Centre of Endemism (Hahn, 1999) and *P. barbertonensis* Bremek. from the Barberton Centre of Endemism (Bremekamp, 1929). In this paper we describe a new species of *Pavetta* near endemic to the Sekhukhuneland Centre of Endemism in northeastern South Africa. In the past, this species often has been included under *P. zeyheri* Sond., but Siebert et al. (2001) and von Breitenbach et al. (2001) first recognized it as an undescribed species in the literature. Subsequently, Schmidt et al. (2002: 642) referred to it as a “large-leaved form” of *P. zeyheri* that “may prove after further research to be a distinct species.” Coates Palgrave (2002) also mentions the Sekhukhuneland taxon under *P. zeyheri* but speculates that it is probably conspecific with *P. microlancea* K. Schum., a taxon known only from the type specimen collected at Komatipoort in easternmost Mpumalanga (Bridson, 2003), outside the range of the new species. A possible link between the new species and *P. microlancea* is refuted by Herman (2005), based on the generally smaller habit, 0.3–1 m, of the latter species, and on *P. microlancea* having fewer-flowered (four to six) umbellate inflorescences, as is

also indicated by Bridson (2003). Herman (2005) suggests that our new species, already collected as early as 1939 (*Mogg 725*, PRE), has been dumped into a taxonomic “waste bin,” namely *P. zeyheri*.

Pavetta glaucophylla Retief, S. J. Siebert & A. E. van Wyk, sp. nov. TYPE: South Africa. Mpumalanga: Sekhukhuneland, Thorncliffe Mine, entrance rd., 1 Dec. 1997 (fl., fr.), *J. E. Burrows 6198* (holotype, PRE; isotype, BNRH). Figure 1.

Species nova secundum morphologiam generalem *Pavettae zeyheri* Sond. proxima, sed ab ea habitu robustiore altioreque, foliis majoribus conspicue glaucis (46–72(–116) × (7–)13(–25) mm et limbo calycis usque ad medium in lobos breviores (0.5–0.75 mm) triangulari-ovatos (non triangulari-lanceolatos) diviso differt.

Erect, deciduous shrub or small tree, (1.5–)2.5(–3.5) m tall; young twigs glabrous; branches thick, robust. Leaves opposite, sometimes appearing fascicled, sessile, glabrous; lamina narrowly elliptic to oblanceolate, (49–)72(–93) × (8–)13(–21) mm, coriaceous, blue-green in living condition, apex acute, base decurrent, margin entire; midrib on lower surface pale and prominent; domatia absent; bacterial nodules dotlike or elliptical, unevenly scattered in lamina; stipules interpetiolar, limb triangular. Inflorescences sub-umbellate, branched, (32–)37(–44) mm wide; primary inflorescence branches 4–6 mm; flowers (14–)17(–21) clustered on short side branches 10–30 mm long; peduncles 6–8 mm; pedicels 3.5–4.5 mm; bracts up to 2 mm, densely white silky-hairy to almost glabrous inside; bracteoles present but inconspicuous. Flowers (14–)17(–21) per inflorescence; calyx 4-lobed, lobes short, triangular-ovate, 0.5–0.75 mm, glabrous, persistent in fruit, never reflexing; corolla 4-lobed, white, tube cylindrical, (10–)13(–15) mm, lobes (15–)19(–23) mm; style slender, distally slightly thickened into an elongated club-shaped pollen presenter, (21–)26(–32) mm; stigmatic surface confined to bidentate apex; stamens 4, arising in corolla mouth; filaments very short; anthers exerted, dorsifixed near the base, linear to oblong, 5–6 mm. Fruit a drupe, spherical, slightly 2-lobed, (5–)6(–8) × (5–)7(–8) mm, black when ripe, with 1 or 2 pyrenes.

Distribution and habitat. *Pavetta glaucophylla* has been collected in the provinces of Mpumalanga and Limpopo in South Africa (Fig. 2) on calcrete, dolerite, dolomite, gabbro norite, magnetite, and, rarely, shale. It is common on stony, rocky soil in open mountain savanna (bushveld), rarely as part of copses of woody vegetation in grassland, and has

been recorded from 500 to 1200 m. The species is confined to that part of the Central Bushveld Bioregion associated with the northeastern Great Escarpment of South Africa, specifically the following vegetation units: Sekhukhune Mountain Bushveld, Sekhukhune Plains Bushveld, and Ohrigstad Mountain Bushveld (Mucina & Rutherford, 2006). Biogeographically, it is near endemic to the Sekhukhuneland Centre of Endemism (mainly on ultramafic substrates), where it ranges, usually on dolomite, into the bordering Wolkberg Centre (van Wyk & Smith, 2001).

IUCN Red List category. *Pavetta glaucophylla* is assessed as of Least Concern (LC) according to IUCN Red List criteria (2001) due to the extent of occurrence, area of occupancy, and the existence of more than 30 known populations (Siebert et al., 2002). *Pavetta glaucophylla* is, however, increasingly subjected to habitat degradation as a result of extensive mining activities and urban expansion in the Sekhukhuneland region.

Phenology. Flowers of *Pavetta glaucophylla* were collected in early summer (November and December) and fruits in summer and autumn (January to May).

Etymology. The epithet *glaucophylla* derives from the Greek and refers to the conspicuous blue-green foliage leaves of the species.

Vernacular names. The local Pedi use the leaves of *Pavetta glaucophylla* as a vegetable, and in Northern Sotho (Sepedi) the plant is called *mabudalalane*, with *budela* meaning “sour,” a reference to the watercress-like taste of the leaves (from *Barnard 1446*, PRE). English and Afrikaans vernacular names for the species are Sekhukhune bride’s bush and *sekhukhunebruidsbos*, respectively (van Wyk et al., 2011).

Discussion. Older herbarium collections of *Pavetta glaucophylla* are mainly identified as *P. zeyheri*, and, more particularly, the infraspecific entity is sometimes recognized as *P. zeyheri* subsp. *zeyheri* (Herman, 2005). The two species are superficially rather similar owing to resemblances in gross morphology and geographical distribution. Differences between *P. glaucophylla* and *P. zeyheri* include the distinctly blue-green and larger, (49–)72(–93) × (8–)13(–21) mm, leaves of the former, compared to the dull dark-green to gray-green and smaller, (24–)38(–50) × (7–)8(–11) mm, leaves of the latter. In *P. glaucophylla* the calyx limb-tube is divided at midpoint into relatively short (0.5–0.75 mm), trian-

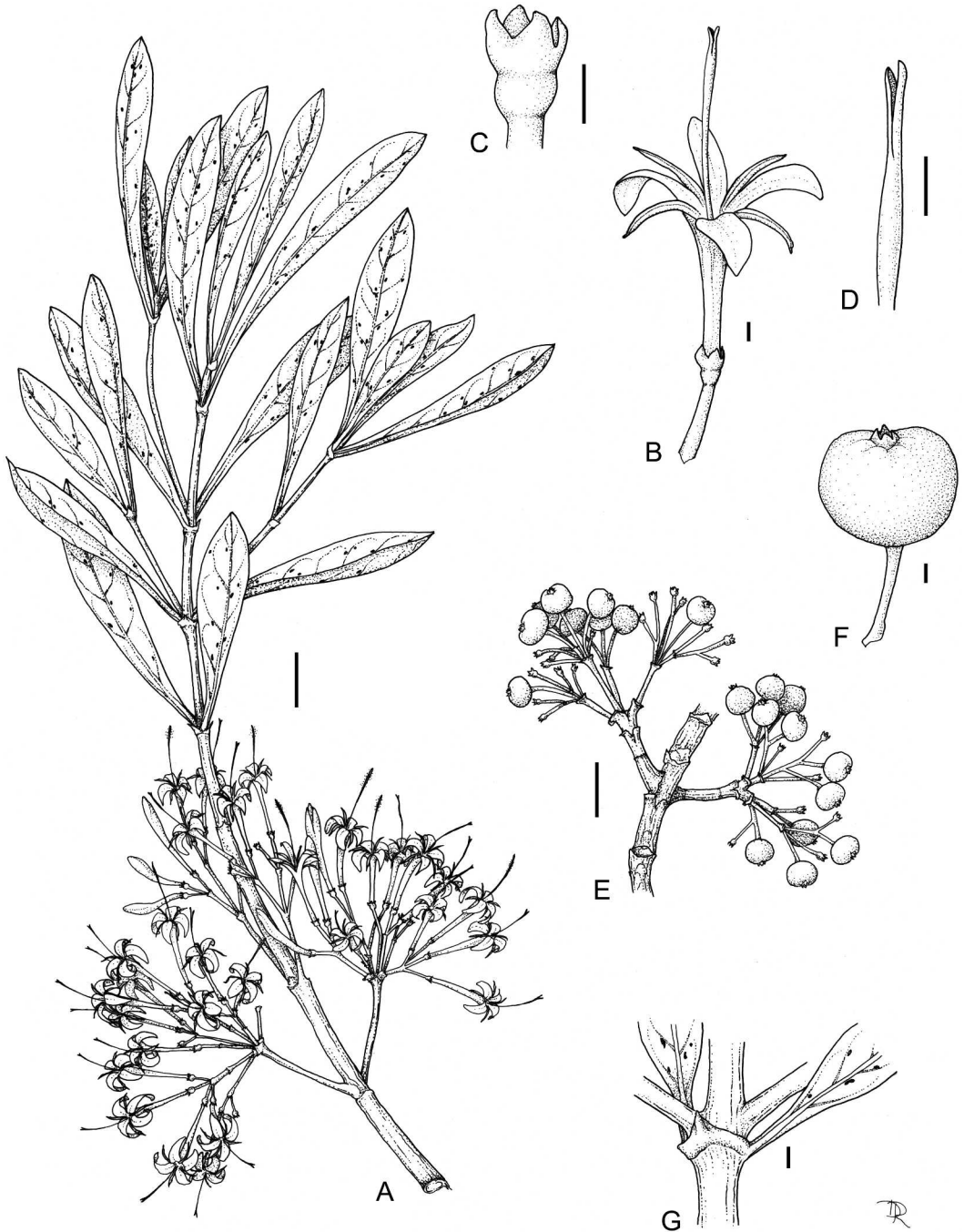


Figure 1. *Pavetta glaucophylla* Retief, S. J. Siebert & A. E. van Wyk. —A. Flowering branch. —B. Flower. —C. Calyx. —D. Pollen presenter with cleft stigma apically. —E. Fruiting branch. —F. Fruit. —G. Stipule. A–D, G drawn from the holotype, *J. E. Burrows 6198* (PRE); E, F from *A. E. van Wyk 12367* (MO). Scale bars: A, E = 10 mm; B–D, F, G = 1 mm.

gular-ovate lobes, but in *P. zeyheri* the calyx limb-tube is shorter than the lobes, with the lobes relatively long (1.25–2 mm) and triangular-lanceolate (for calyx limb types in southern African *Pavetta*, see

Bridson, 2003). *Pavetta glaucophylla* is also a more robust and larger plant, (1.5–)2.5(–3.5) m high, with *P. zeyheri* generally slender and smaller, (1–)2(–3) m high.

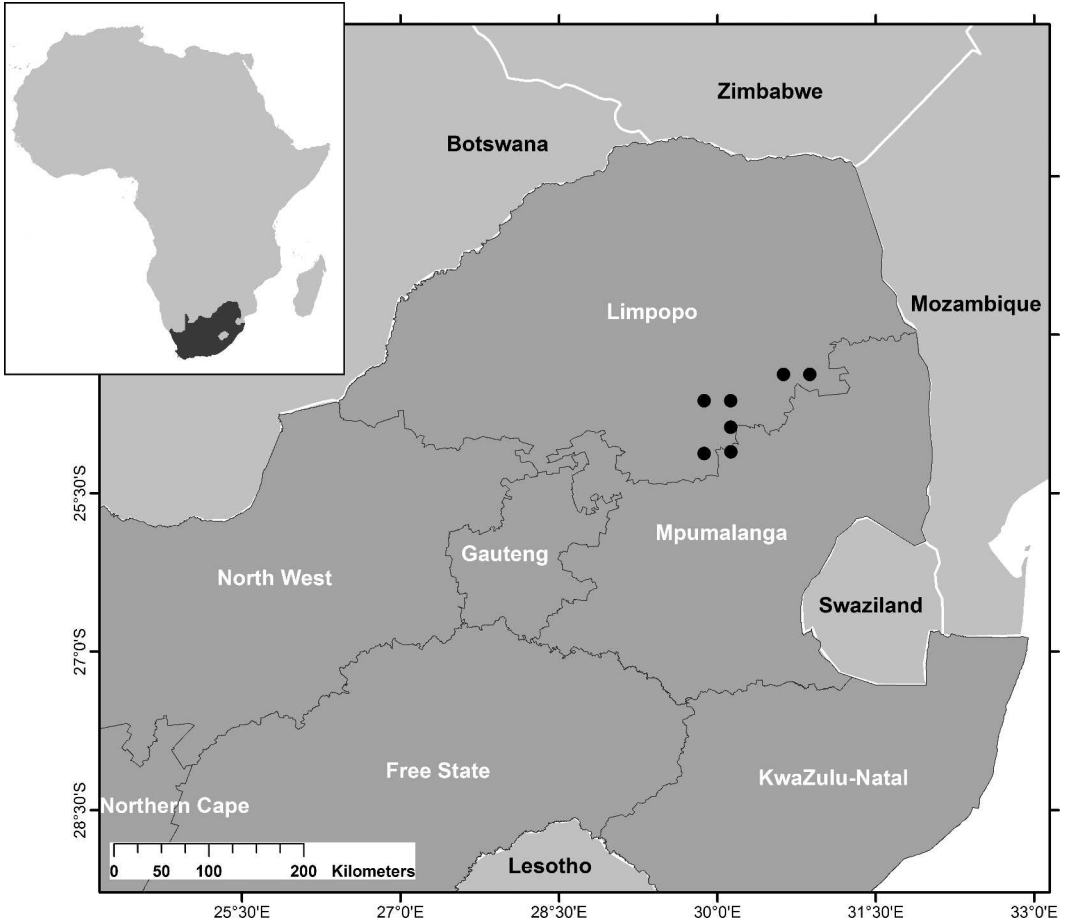


Figure 2. Known geographical distribution of *Pavetta glaucophylla* Retief, S. J. Siebert & A. E. van Wyk in South Africa. Black dots indicate collection localities for the species as vouchered by the type and paratype collections.

To a lesser extent, *Pavetta glaucophylla* was previously also misidentified as *P. inandensis* Bremek. and *P. lanceolata* Eckl. However, these latter two species are easily distinguished by their distinctly petiolate leaves, and the corymbose inflorescences terminal on short branches, never paired, both the inflorescence and its individual parts subtended by leaf pairs (Kok et al., 1987; Bridson, 2003). The leaves of *P. glaucophylla* and *P. zeyheri* are sessile and the sub-umbellate inflorescences terminal on short leafless branches, usually two per node. Moreover, *P. inandensis* and *P. lanceolata* are characterized by stipules with elongated apices up to 3 mm long and domatia on the lower surface of the leaves, whereas *P. glaucophylla* and *P. zeyheri* have broadly triangular stipules and no domatia. *Pavetta lanceolata* further differs from the new species and *P. zeyheri* in having smaller flowers, corolla tube (8–)11(–14) mm long, and smaller fruit, (5–)5.5(–6) × (4–)5(–6) mm. *Pavetta inandensis* also differs in having much larger

leaves, (63–)81(–107) × (15–)20(–27) mm, than *P. zeyheri*, and broader inflorescences, (55–)71(–100) mm, than *P. glaucophylla*. *Pavetta zeyheri* has the largest flowers, (10–)14(–18) mm tube length, of all the species considered here.

Paratypes. SOUTH AFRICA. **Limpopo:** Farm Parys, 5 Jan. 1939 (fr.), A. O. D. Mogg 725 (PRE); Schoonoord, NNW of town, Km. 25, 22 Nov. 1959 (fl.), J. P. H. Acocks 20941 (PRE); Schoonoord, Nov. 1941, N. J. van Warmelo 89 (PRE); Farm Zoetvelden, 8 Nov. 1935 (fl.), W. G. Barnard 144B (PRE); Penge, circular mine shaft in town, 1 Apr. 1972 (fr.), J. P. Nel 195 (PRE); Strydom Tunnel, cliff at S entrance, 2 Feb. 1982 (fr.), A. E. van Wyk, R. Dahlgren & P. D. F. Kok 5474 (PRU); 26 Feb. 1981 (fl.), A. E. van Wyk 5181 (PRU); Strydom Tunnel, Farm Perkeo, next to old tufa waterfall, 21 Aug. 1985 (fr.), F. Venter 10860 (PRU). **Mpumalanga:** Roossenekal, Mapoch's Cave rd., Km. 2.5, 14 Nov. 1997 (fl.), S. J. Siebert 22 (PRE); Thorncliffe, entrance rd. to mine, 17 May 1997 (fr.), *Plant Specialist Group 15* (PRE); Farm Dwarsrivier, 24°55'66" S, 30°07'22" E, 17 Nov. 1998 (fl.), G. B. Deall 4174 (PRU); Roossenekal, rd. to Steelpoort, Km. 14, 13 Apr.

1994 (fr.), *A. E. van Wyk 12367* (MO); Roosenekal, railway station on tar rd. to Steelpoort, Km. 11, 6 Apr. 1994 (fr.), *P. van Wyk BSA2054* (PRU); Farm Dwarsrivier, rd. to Lydenburg, Km. 4, 17 Feb. 1987, *A. E. van Wyk 8015* (MO, PRU); Stoffberg, before Mapoch's Mine, Km. 8, 17 Feb. 1987, *A. E. van Wyk 8020* (PRU); Steelpoort, Ferrochrome Holdings, rd. to factory dam, Km. 2, 12 Feb. 1998 (fr.), *S. J. Siebert 297* (PRU); Roosenekal, rd. from Mapoch's Mine to Steelpoort, Km. 4, 11 Apr. 2000 (fr.), *A. E. van Wyk, S. J. Siebert & Y. Steenkamp 1465* (PRU).

Acknowledgments. We are grateful to Otto Leistner for the Latin diagnosis, John Burrows for the type material, Daleen Roodt for the line drawings, and Marié du Toit for the distribution map. The National Research Foundation of South Africa and the South African National Biodiversity Institute provided financial support.

Literature Cited

Bremekamp, C. E. B. 1929. A revision of the South African species of *Pavetta*. *Ann. Transvaal Mus.* 13: 182–213.
Bridson, D. M. 2003. *Pavetta* L. *Fl. Zambes.* 5(3): 544–598.
Coates Palgrave, K. 2002. *Trees of Southern Africa*, 3rd ed., rev. and updated by M. Coates Palgrave. Struik, Cape Town.
Germishuizen, G., N. L. Meyer, Y. Steenkamp & M. Keith. 2006. A Checklist of South African Plants. SABONET Report 41. Southern African Botanical Diversity Network (SABONET), Pretoria.
Hahn, N. 1999. A new species of *Pavetta* from the Soutpansberg, South Africa. *Bothalia* 29(1): 107–109.
Herman, P. P. J. 2005. Intraspecific taxa in a southern African *Pavetta* species. *Bothalia* 35(1): 84–87.

IUCN. 2001. IUCN Red List Categories and Criteria, Version 3.1. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland, and Cambridge, United Kingdom.
Kok, P. D. F., A. E. van Wyk & W. F. Reyneke. 1987. Studies in *Pavetta* (Rubiaceae). III. *Pavetta lanceolata* and its allies (section *Aethiopinymphe*). *S. African J. Bot.* 53(2): 147–154.
Mucina, L. & M. C. Rutherford. 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia*, Vol. 19. South African National Biodiversity Institute, Pretoria.
Retief, E. & O. A. Leistner. 2000. Rubiaceae (Asteridae-Rubiales). Pp. 476–495 in O. A. Leistner (editor), *Seed Plants of Southern Africa: Families and Genera*. *Strelitzia*, Vol. 10. National Botanical Institute, Pretoria.
Siebert, S. J., A. E. van Wyk & G. J. Bredenkamp. 2001. Endemism in the flora of ultramafic areas of Sekhukhuneland, South Africa. *S. African J. Sci.* 97: 529–532.
Siebert, S. J., A. E. van Wyk & G. J. Bredenkamp. 2002. The physical environment and major vegetation units of the Sekhukhuneland Centre of Plant Endemism, South Africa. *S. African J. Bot.* 68(2): 127–142.
Schmidt, E., M. Lötter & W. McClelland. 2002. *Trees and Shrubs of Mpumalanga and the Kruger National Park*. Jacana, Johannesburg.
van Wyk, A. E. & G. F. Smith. 2001. *Regions of Floristic Endemism in Southern Africa: A Review with Emphasis on Succulents*. Umdaus Press, Hatfield, Pretoria.
van Wyk, B., E. van den Berg, M. Coates Palgrave & M. Jordaan. 2011. *Dictionary of Names for Southern African Trees*. Briza Publications, Pretoria.
von Breitenbach, J., B. de Winter, R. Poynton, E. van den Berg, B. van Wyk & E. van Wyk. 2001. *Pocket List of Southern African Indigenous Trees: Including Selected Shrubs and Woody Climbers*, 4th ed. Briza Publications and the Dendrological Foundation, Pretoria.