

# A revision of the genus *Virgilia* (Fabaceae)

B.-E. van Wyk

Department of Botany, University of Stellenbosch, Stellenbosch

The taxonomic history, position within the subfamily Papilionoideae and morphological variation of the genus *Virgilia* Poir. are briefly discussed. Three taxa, namely *V. oroboides* (Berg.) Salter subsp. *oroboides*, *V. oroboides* (Berg.) Salter subsp. *ferruginea* B.-E. van Wyk subsp. nov. and *V. divaricata* Adamson are described. Keys to the species and subspecies are provided and the natural distribution given.

*S. Afr. J. Bot.* 1986, 52: 347–353

Die taksonomiese geskiedenis, posisie binne die subfamilie Papilionoideae en die morfologiese variasie van die genus *Virgilia* Poir. word kortliks bespreek. Drie taksons, naamlik *V. oroboides* (Berg.) Salter subsp. *oroboides*, *V. oroboides* (Berg.) Salter subsp. *ferruginea* B.-E. van Wyk subsp. nov. en *V. divaricata* Adamson word beskryf. Sleutels tot die spesies en subspecies word verskaf en die natuurlike verspreiding aangegee.

*S.-Afr. Tydskr. Plantk.* 1986, 52: 347–353

**Keywords:** Fabaceae, taxonomy, *Virgilia*

## Introduction

The genus *Virgilia* had been treated for a considerable time as monotypic until a second species was described in 1934. In the absence of reliable morphological characters that enable the two species to be distinguished and recognized, their status has been subject to differing taxonomic interpretations. Despite the popularity of members of the genus as ornamental trees and their ecological importance as forest margin pioneers, surprisingly little information is available on the geographical distribution, morphological variation and biology of the genus. The aim of this study was to clarify the status and circumscription of the various taxa and to provide a means for identifying them. The taxonomic treatment in this paper is the result of a study of the variation within and between a number of geographically representative populations of *Virgilia*.

## Position within the family

*Virgilia* is an isolated genus within the subfamily Papilionoideae and its affinities with other genera are not clear. As a forest margin relict with pulvinate, pinnate leaves and free stamens, it is traditionally placed in the tribe Sophoreae. The presence of more than seven different quinolizidine alkaloids (Gerrans *et al.* 1971; Van Eijk & Radema 1982) seems to support its position within the Sophoreae. The sophoreae appears to be an unnatural group, however. Cytological evidence (Goldblatt 1981) indicates that the tribe should be redefined.

Polhill (1981) placed *Virgilia* in the redefined Podalyrieae, together with two other Cape genera, *Podalyria* Willd. and *Cyclopia* Vent. The new classification rests on the assumption of local diversification and speciation and has a very definite geographical basis. The only diagnostic characters of the Podalyrieae *sensu* Polhill (1981) are the intrusive calyx base, collar-like aril and dimorphic stamens. As in many Sophoreae, Mirbelieae, Bossiaeeae, Liparieae and Crotalarieae, the chromosome base number of the tribe is 9. There can be no serious objection to the inclusion of *Virgilia* ( $2n = 54$ ) with *Podalyria* ( $2n = 18$ ) and *Cyclopia* ( $2n = 36$ ) in the newly defined Podalyrieae. According to Polhill (1981), a tribe does not necessarily reflect major disjunctions in intergeneric variation, but is a convenient group that shows basic affinities. A biogeographical basis for the subdivision of the subfamily makes sense, even if only from a practical point of view.

## Taxonomic history

The first species of *Virgilia* was originally described by Bergius and Linnaeus as a *Sophora* species, based on obvious

B.-E. van Wyk

Present address: Department of Botany,  
Rand Afrikaans University, P.O. Box 524, Johannesburg,  
2000 Republic of South Africa

Accepted 19 February 1986

similarities with various legumes then known as *Sophora*. Thereafter a number of other generic names followed — *Podalyria* (Willdenow 1799), *Hypocalyptus* (Thunberg 1823) and *Andrastis* (Raf. ex Benth. 1838). The genus *Virgilia* was described by Poiret in 1808. These authors included with *Virgilia oroboides* other species that were later recombined under *Sophora*, *Podalyria*, *Calpurnia* and others.

The name *Virgilia* was originally published in 1793 (Lamarck 1793) accompanied only by two illustrations. The text accompanying the figures was only published some years later, in 1819. Poiret (1808) gave a detailed description of the new genus and referred to the illustration in Lamarck.

When the Rules concerning homonyms were changed in 1930, a proposal for conservation by Rehder *et al.* (1935) was accepted, and *Virgilia* Lam. Illustr. ii 454 t. 326 (1793) was conserved against the earlier homonym *Virgilia* L'Hérit. (Sprague 1940). This conservation prevented a change in generic name to *Andrastis* Raf. ex Benth. (1838).

It was later established that the name *Virgilia* Lam. does not date from 1793, since the original description was accompanied by an illustration of two different species. The legend of these illustrations (Tabl. Enc. 2: 470, 471) was only published in 1819 (Rickett & Stafleu 1959). The later description of Poiret (1808) is therefore the earliest valid generic description. *Virgilia capensis* (L.) Poir. (*Sophora capensis* L.) was conserved as the type of genus.

The discovery that the Mantissa Plantarum of Linnaeus was preceded by Bergius' Descriptiones plantarum necessitated a new combination. Bergius (1767), who used herbarium material of his own, described the Cape *Sophora* as *Sophora oroboides*, recombined by Salter (1939) as *Virgilia oroboides* (Berg.) Salter.

The variation within the genus was not known to later authors (Meyer 1835; Pappé 1862; Harvey 1862; Sim 1907; and Marloth 1925) who regarded *Virgilia* as monotypic.

In 1934 Adamson described a new species, *V. divaricata*. The very cryptic paper (three short paragraphs) did not clarify the diagnostic features and differences between the two species. His description was strictly speaking only applicable to specimens from the type locality. As a result, some doubt remained about the status of the new species.

Von Breitenbach (1965) regarded the two species as varieties of *V. oroboides*. He includes a form of *Virgilia* from the George area (here described as a new subspecies) under a new combination *V. oroboides* (Berg.) Salter var. *divaricata* (Adamson) Von Breitenbach.

The first distribution map of *Virgilia* was published in a Russian journal (Yakovlev 1970). Unfortunately, a technical error in the symbols on the map (Yakovlev pers. comm.) makes it worthless. He distinguished three taxa — *V. divaricata* Adamson, *V. capensis* (L.) Poir. subsp. *capensis* and a new subspecies, *V. capensis* (L.) Poir. subsp. *albescens* Yakovlev. The latter is treated as a synonym of *V. oroboides* subsp. *oroboides* in this account.

### Morphological variation

In some populations of *V. oroboides* and *V. divaricata*, notably those from Swellendam and Ladismith respectively, various characters are well correlated, but an endless array of variations between these two extremes exists, in which a combination of seemingly uncorrelated characters is present. A few characters are geographically correlated along an east-west gradient and are of diagnostic value to distinguish three taxa. This geographical trend is shown in the illustrated key (Figure 1). Care should be taken not to consider only a

single character when trying to identify a specimen, although this may often be possible.

A detailed analysis of the morphological discontinuities between 18 representative populations of *Virgilia* is given by Van Wyk (1983).

### The genus *Virgilia*

*Virgilia* Poir. in Lam., Encycl. 8:677 (1808) *pro parte*, *nom. cons.*; Ait. f., Hort. Kew. 2nd edn. 2,3:4 (1812) *pro parte*; DC., Prodr. 2:98 (1825) *pro parte*; E. Mey., Comm. 1:1 (1835); Harv., Gen. S. Afr. pl.: 88 (1838); Harv. in Harv. & Sonder, Fl. Cap. 2:266 (1862); Pappé, Silv. Cap.: 15 (1862); Benth. & Hook. f., Gen. Pl. 1:554 (1865); Engl. & Prantl, Pflanzenfam. 3,3:198 (1894); Sim, For. Fl. Cape Col.:204 (1907); Marloth, Fl. S. Afr. 2,1:72 (1925); Adamson & Salter, Fl. Cape Penins.:459 (1950); Phill., Gen. 2nd edn.:400 (1951); Hutch., Gen. Fl. Pl. 1:323 (1964); Von Breitenbach, Ind. Trees S. Afr. 3,2:355 (1965); Yakovlev in Bot. Zhurn. 55:837 (1970); Palmer & Pitman, Trees S. Afr. 2:903 (1973); Dyer, Gen. S. Afr. Fl. Pl. 1:245 (1975); Coates Palgrave, Trees S. Afr.:301 (1977); Polhill in Polhill & Raven, Adv. Leg. Syst.: 397 (1981). Type species: *V. capensis* (L.) Poir. (*typ. cons.*), = *V. oroboides* (Berg.) Salter.

*Sophora sensu* Berg., Descr. Pl.:142 (1767) *pro parte*; L., Mant.: 67 (1767) *pro parte*; Andr., Bot. Rep. 5:347 (1812) *pro parte*.

*Podalyria sensu* Willd., Sp. Pl. 2,1:501 (1799) *pro parte*.

*Hypocalyptus sensu* Thunb., Fl. Cap. 2:570 (1823) *pro parte*.

*Andrastis* Raf. ex Benth. in Ann. Wien. Mus. 2:86 (1838).

The generic name commemorates the Roman poet Virgil (70–19 BC).

Small trees, 4–15(–20) m tall, basal diameter of trunk (0,2–)0,5(–0,9) m, with a single or branched main stem; crown narrow or spreading, sparse. *Bark* brown, grey or black; thick and coarse or smooth. *Twigs* glabrescent; leaf scars thickened and conspicuous; young twigs with ferruginous or white tomentum, or glabrous. *Leaves* very variable, alternate, imparipinnate with (2–)6–12(–23) pairs of pinnae; leaf length (20–)40–100(–200) mm, width (20–)30–50(–80) mm; rachis adaxially grooved. *Pinnae* subsessile, pulvinate, opposite or alternate, linear, linear-lanceolate, elliptic or narrowly ovate, length (10–)20–30(–60) mm, width (2–)4–7(–16) mm, terminal pinna usually longer and/or wider, base acute to round, apex acute to obtuse, round or emarginate, with short mucro; margin entire, slightly revolute, villous ad- and abaxially when young, adaxially glabrescent, abaxially densely pubescent or glabrescent; petiole 1–2 mm. *Petiole* (2–)6–10(–17) mm long, thickened basally, pulvinate. *Stipules* linear, straight or curled, apex acuminate or apiculate, length (2–)4–8(–12) mm, width (0,5–)1(–2) mm, pubescent or glabrous, caducous or persistent. *Inflorescences* axillary and subterminal, racemes or very rarely panicles, length (20–)50–90(–160) mm; peduncles (10–)40–70(–140) mm, tomentose or nearly glabrous. *Bracts* small and caducous, or large and somewhat persistent, length (2–)4–10(–15) mm, width (0,5–)2–6(–10) mm, acicular, linear, lanceolate or broadly lanceolate, sometimes with two lateral teeth below apex; apex acuminate or apiculate. *Flowers* 3–16 or more per inflorescence, rose-violet, violet-purple, pink or rarely white, 10–20 mm long; scented; pedicels (4–)8–12(–21) mm long, tomentose, with or without two minute bracteoles below the calyx. *Calyx* 2-lipped, tomentose, tube basin-shaped, compressed laterally, with hypanthium intruding at the base, upper lip 2-toothed, reflexed at anthesis, lower lip 3-toothed, straight at anthesis,

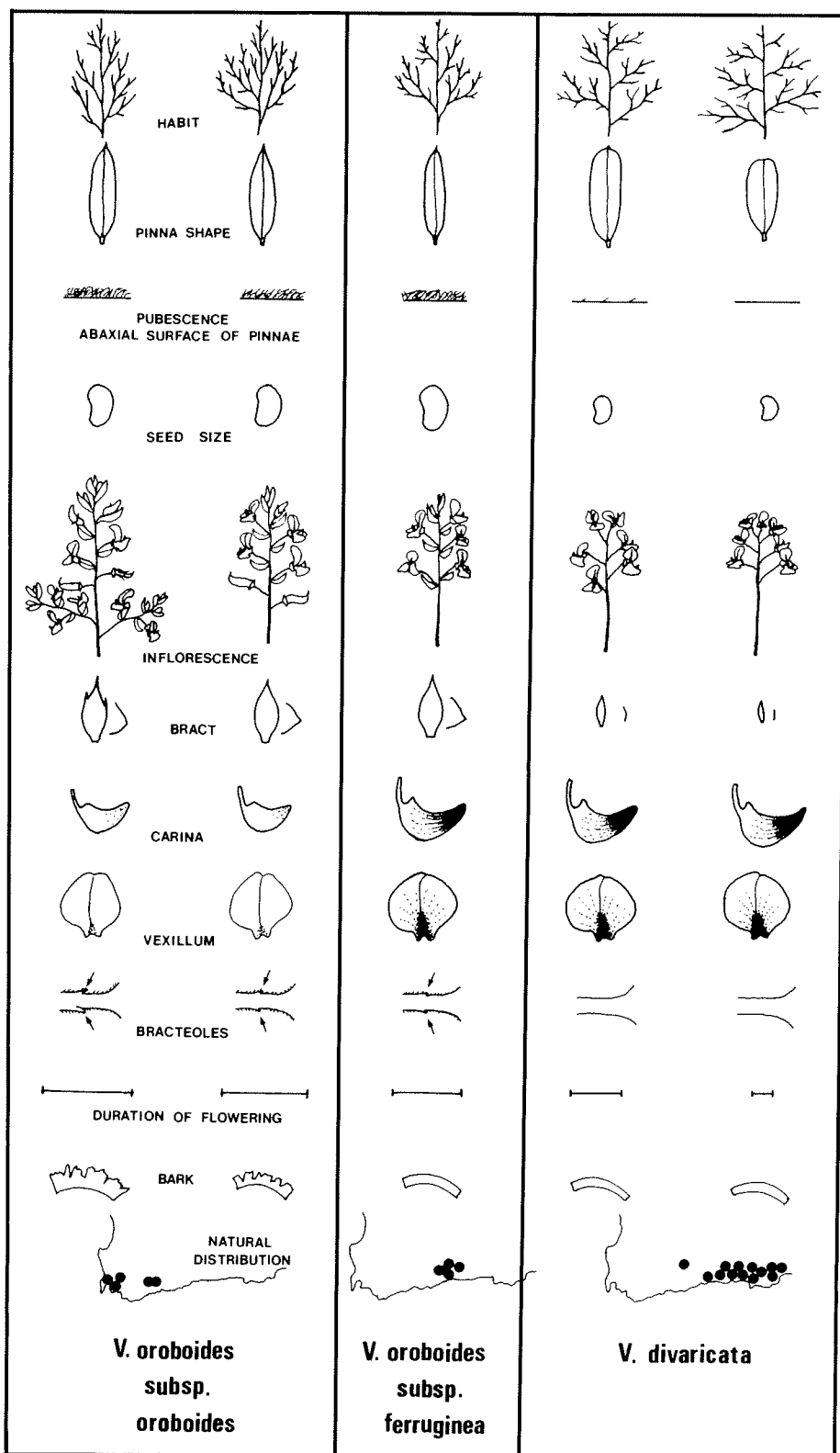


Figure 1 Illustrated synoptic key to the species and subspecies of *Virgilia*. The geographical variation of some characters is shown.

both longer than tube. *Vexillum* suborbicular or obovate, strongly reflexed, base narrow, clawed, claw adaxially grooved, nectar guide prominent or inconspicuous. *Alae* broadly falcate, clawed. *Carina* shorter than alae, incurved, beaked, the two petals abaxially partly fused, clawed, the beak purple or yellow-green (pollen guide). *Stamens* 10, free, arranged in a tight tube around the pistil, two vexillar stamens deformed at base to form a small opening between them; filaments linear, narrowing upwards, villous; anthers small, slightly dimorphic (alternately basifixed or attached a little higher), versatile. *Ovary* shortly stalked, laterally compressed,

densely villous; ovules 5–8, ovoid; style curved, laterally compressed, narrowing upwards, nearly glabrous; stigma small, wet type, papillate and with a fringe of hairs. *Pollen* tricolporate, length (equatorial view) 26–32  $\mu\text{m}$ , width (polar view) 22–26  $\mu\text{m}$ , with granular, membranous operculi, exine surface supra-reticulate. *Pods* dehiscent, sometimes only along upper suture, coriaceous or somewhat woody, linear to oblong, 2-valved, slightly compressed between the seeds, length (15–)30–40(–69) mm, width (7–)9–11(–15) mm, brown or greyish-brown, densely tomentose, persistent for some time. *Seeds* laterally compressed, oblong-reniform to suborbicular

in lateral view, occasionally angular, length 5–9 mm, width 3–6 mm, yellow-brown, dark brown or black; aril small, collar-like; radicle short, inflexed; endosperm thick, encasing the cotyledons.  $2n = 54$ .

Limited to moist sites along the Cape coastal region of South Africa, from the Cape Peninsula to Port Elizabeth. Two species, one with two subspecies (three geographically isolated taxa) are distinguished.

### Key to the species and subspecies

Bracts  $2-5 \times 0,5-3$  mm at maturity, caducous before buds are 5 mm long; mature pinnae abaxially glabrescent (sometimes pubescent, but then along the midrib only); pinna apex round, truncate or emarginate; seeds small (30–55 mg each); bark smooth .....

..... 2. *V. divaricata*

Bracts  $7-15 \times 4-10$  mm at maturity, persistent until buds are 10 mm long; mature pinnae abaxially densely pubescent, pinna apex acute to obtuse; seeds large (50–90 mg each); bark coarse or smooth .....

..... 1. *V. oroboides*

Flowers pale pink or white, beak pale pink or yellowish-green; leaves and twigs conspicuously white-pubescent, bark coarse; peak flowering period summer; Cape Peninsula to Swellendam ....

..... 1a. *V. oroboides* subsp. *oroboides*

Flowers rose-violet or violet-purple; beak dark purple; leaves and twigs conspicuously ferruginously pubescent; bark smooth; peak flowering period spring; limited to around George in the southern Cape .....

..... 1b. *V. oroboides* subsp. *ferruginea*

#### 1. *Virgilia oroboides* (Berg.) Salter in JI S. Afr. Bot. 5:58 (1939).

Small erect tree, 5–15(–20) m tall, basal diameter of trunk up to 0,9 m. Bark coarsely reticulate or smooth. All young parts densely pubescent, white or ferruginous. Pinnae in (2–)6–12(–23) pairs, linear to lanceolate, abaxially densely pubescent at maturity; apex acute to obtuse; mucro conspicuous, up to 2 mm long. Stipules (3–)5–8(–12) mm long, (0,5–)1(–2) mm wide. Inflorescence a raceme, rarely a panicle of up to 3 racemes, the upper flowers sometimes opening long after the lower ones (flowers and young fruit then present on the same raceme). Flowers rose-violet, violet-purple, pink or white; pedicels (4–)8–12(–15) mm long, densely tomentose, with two minute bracteoles at an articulation zone below the calyx (the point of dehiscence of unfertilized flowers). Nectar guide at base of vexillum

prominent or inconspicuous. Pollen guide on beak dark purple, pink or yellow-green. Pods up to 15 mm wide. Seeds large, (50–)60–70(–90) mg each.

The specific epithet refers to a resemblance to the genus *Orobus*.

### Diagnostic characters

Mature pinnae densely pubescent on the abaxial side, the apices acute to obtuse. Bracts large,  $7-15 \times 4-10$  mm, persistent until buds are 10 mm long. Two minute bracteoles present on pedicel below the calyx-tube. Seeds large (50–)60–70(–90) mg each.

### Natural distribution

Limited to the south-western and southern Cape coastal region, from the Cape Peninsula to George (Figure 2).

#### (a) subsp. *oroboides*

*Virgilia oroboides* (Berg.) Salter in JI S. Afr. Bot. 5:58 (1939); Adamson & Salter, Fl. Cape Penins.: 459 (1950); Palmer & Pitman, Trees S. Afr. 2:903 (1973) *pro parte*; Coates Palgrave, Trees S. Afr.:301 (1977) *pro parte*. Type: Cape Province — 'E. Cap. B. Sp.', Ekeberg s.n. (SBT, holo.!; S, iso.!).

*Sophora oroboides* Berg., Descr. Pl.:142 (Sept. 1767).

*Virgilia capensis* (L.) Poir. subsp. *albescens* Yakovlev in Bot. Zhurn. 55:837 (1970). Type: 'Cape Swellendam distr., Barrydale Pass', Van Breda 1517 (PRE, holo.!).

*Sophora capensis* L. Mant.:67 (Nov. 1767); Andr., Bot. Rep. 5:347 (1812). Type: 'Habitat ad Cap. b. Spei.' (LINN 522.8, lecto., designated here, microfiche!).

*Virgilia capensis* (L.) Lam., Tabl. Encycl. t. 326. fig. 2 (1793); Pers., Syn. Pl. 1:453 (1805); Poir. in Lam., Encycl. 8:677 (1808); Ait. f., Hort. Kew. 2nd edn, 2,3:4 (1812); Curtis in Curtis's Bot. Mag. 38:1590 (1813); DC., Prodr. 2:98 (1825); E. Mey., Comm. 1:1 (1835); Eckl. & Zeyh., Enum. 2:153 (1836); Harv. in Harv. & Sonder, Fl. Cap. 2:266 (1862); Pappe, Silv. Cap.:15 (1862); Benth. & Hook. f., Gen. Pl. 1:554 (1865); Sim, For. Fl. Cape Col.:204 (1907); Marloth, Fl. S. Afr. 2, 1:72 (1925).

*Podalyria capensis* (L.) Willd., Sp. Pl. 2, 1:501 (1799).

*Hypocalyptus capensis* (L.) Thunb., Fl. Cap. 2:570 (1823).

I have no hesitation in accepting the Ekeberg specimen as holotype. It bears the inscription 'mihi oroboides Linné capensis' in Bergius' own handwriting.

LINN 522.8 is chosen as lectotype because it was marked

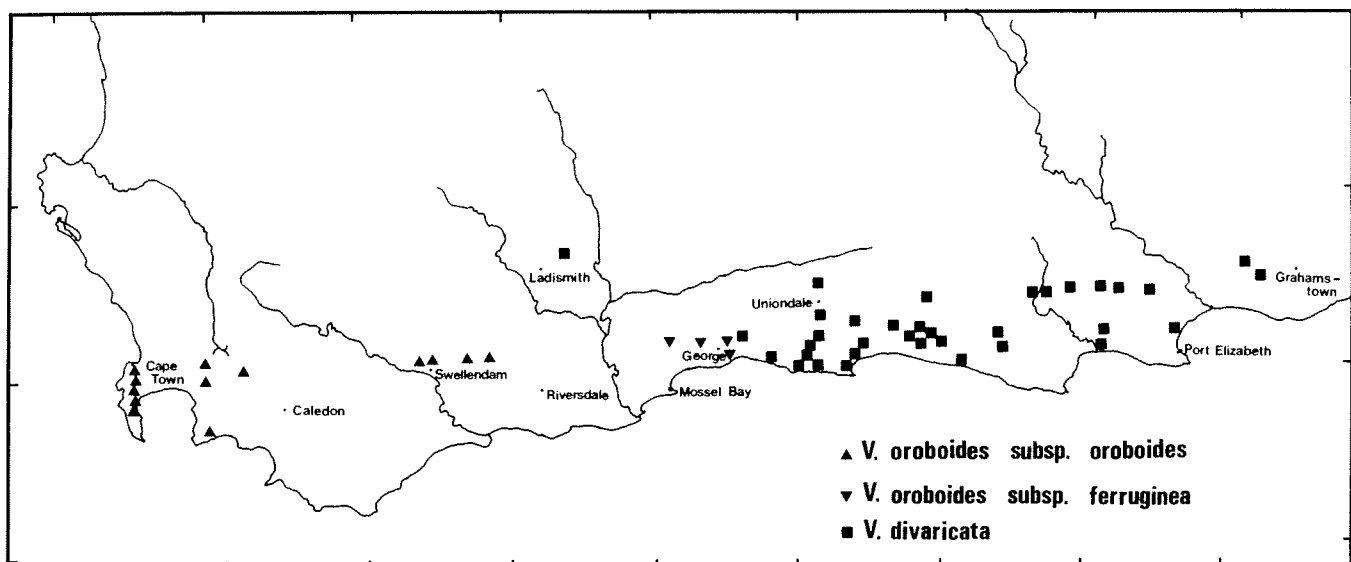


Figure 2 The natural distribution of the species and subspecies of *Virgilia*.

as 'Sophora capensis' by Linnaeus himself. LINN 522.7 is similarly annotated, but with a note that the specimen came from Bergius.

#### Diagnostic characters

*Flowers* pale pink or white (RHS 65 B,C,D; 69A, B; 73 C, D; 75 D); *Beak* (apex of carina; pollen guide) pale pink or yellow-green. *Leaves* and *twigs* conspicuously white-pubescent. *Bark* coarsely reticulate. Peak flowering period in summer, i.e. November to April. Cape Peninsula to Swellendam (Figure 2).

#### Specimens examined

— **3318** (Cape Town): Cape Town (–CD), *De Wyllder s.n.* (S); *Hafström s.n.* (S); Table Mountain (–CD), *Anderson s.n.* (S); *Drège s.n.* (S); *Ecklon s.n.* (S); *Flanagan 2465* (PRE); *Penther 2516* (S); *Pillans 2465, 3051* (PRE); *Thode A10* (PRE); *Zeyher s.n. sub SAM 15619* (SAM); Kirstenbosch, Table Mountain (–CD), *Humbert 9660* (PRE); *Platteklip*, Table Mountain (–CD), *Marloth 5312* (PRE); *Thode 9390* (STE); *Van Wyk 505, 506, 507, 508, 509, 510, 511, 842* (FFS); Windowstream, Table Mountain (–CD), *Esterhuysen 12484* (BOL); *Van Wyk 513, 514, 515, 516, 517* (FFS); Jonkershoek (–DD), *Faure H777* (PRE); *Strey 608* (PRE); Kleinplasië, Jonkershoek (–DD), *Van Wyk 463, 479, 480, 481, 482, 483, 484* (FFS); Langrivier, Jonkershoek (–DD), *Kerfoot K. 5259* (STE); Stellenbosch (–DD), *Anderson s.n.* (S).

— **3319** (Worcester): Franschoek Pass (–CC), *Van Wyk 844, 845, 846* (FFS).

— **3320** (Montagu): Swellendam (–CD), *Wurtz 588* (NBG); Duiwelsbos, Swellendam (–CD), *Van Wyk 578, 795, 796* (FFS); Glenstream, Swellendam (–CD), *Van Wyk 587, 798* (FFS); Koloniesbos, Swellendam (–CD), *Van Wyk 584* (FFS); Barrydale Pass (–DC), *Van Breda 1517* (PRE); Tradouw Pass (–DC) *Barnard s.n. sub SAM 29018* (SAM); *Van Wyk 467, 468, 469, 470, 471, 472, 474, 799, 800, 801, 802, 803, 805, 806* (FFS); Grootvadersbosch (–DD), *Van Wyk 462, 464, 465, 466* (FFS); Strawberry Hill (–DD), *Stokoe s.n. sub SAM 68755* (SAM).

— **3418** (Simonstown): Constantia, Bergvliet (–AB), *Purchell 304, 305* (SAM); Klein Constantia, eastern side of Vlakkenberg (–AB), *Van Wyk 843* (FFS); Simonstown (–AB), *Anderson s.n.* (S); *Pretorius s.n.* (FFS); Red Hill, Simonstown (–AB), *Lam et Meuse 4266* (S); *Van Wyk 698, 700, 701, 702, 703* (FFS); St. James (–AB), *Goldblatt 1386* (NBG, PRE); Silvermine Valley (–AB), *Glover s.n.* (BOL); Tokai Plantation (–AB), *Keet s.n. sub STEU 13653* (STE); Lourensford Estate (–BB), *Mostert s.n.* (FFS); *Van Wyk 486, 488, 489, 490, 491, 492, 493, 494, 495, 496* (FFS); Somerset West, Helderberg (–BB), *Parker s.n. sub BOL 27941* (BOL); Disakloof, Betty's Bay (–BD), *Van der Merwe 1343* (PRE); *Van Wyk 499, 500, 501, 502, 504* (FFS); Harold Porter Botanical Garden, Betty's Bay (–BD), *Ebersohn 14/69* (NBG); *Van Wyk 498, 498a, 498b, 505* (FFS).

Without precise locality: 'Cap. b. Spei.' *Ekeberg s.n.* (SBT, holo.); *Ekeberg s.n. sub S 3608* (S, iso.); *Ecklon & Zeyher 1141* (SAM); *Gröndahl s.n.* (S); *Sieber 240* (BOL, PRE, S); *Thunberg s.n. sub Thunb. Herb. 16340* (UPS), *s.n.* (S), *s.n.* (SBT); *Wänman s.n.* (SBT); *Zeyher 2253(b)* (SAM); 'Capfläche', *Ecklon s.n. sub S 1864* (S).

Without locality: *Alster s.n.* (S); *Gröndahl s.n.* (S); *Wahlberg s.n. sub S2006* (S); *Zeyher 860, 2253* (S).

Doubtful locality: 'Zwartkopsrivier', *Ecklon & Zeyher s.n., pro parte* (S).

(b) subsp. **ferruginea** B.-E. van Wyk, subsp. nov.

*Virgilia capensis* (L.) Poir. subsp. *capensis sensu* Yakovlev in Bot. Zhurn. 55:837 (1970).

Haec subspecies *V. oroboidi* (Berg.) Salter subsp. *oroboidi* affinis, sed ita differt colore florum violaceo-roseolo ad violaceo-purpureo, apice carinae (rostrum) atropurpureo; foliis et ramulis indumento conspicue ferrugineo; cortice plerumque laevae; florescenti principalis in vere; habitatione limitata in agro 'George', in Capite bonae spei australi.

TYPUS. — Cape Province: Montagu Pass, *Compton 7386* (NBG, holotypus!; BOL, isotypus!).

The subspecific epithet refers to the colour of the indumentum on all young parts.

#### Diagnostic characters

*Flowers* rose-violet or violet-purple (RHS 70 A, B; 74 C, D), *beak* (apex of carina; pollen guide) dark purple. *Leaves* and *twigs* conspicuously ferruginously pubescent. *Bark* usually smooth. Peak flowering period in spring. Restricted to the George district in the southern Cape (Figure 2).

This taxon probably originated as a hybrid between *V. oroboides* subsp. *oroboides* and *V. divaricata*. It is fairly widespread around George, occurring in a number of populations that are geographically isolated from those of *V. oroboides* subsp. *oroboides*. The diagnostic characters (flower colour and indumentum) appear to be genetically stable. Young trees grown from seed were identical to the original (wild) individuals. The flowers and bark are similar to that of *V. divaricata*, but the general morphology conforms to the range of variation found in *V. oroboides* subsp. *oroboides*. This was clearly shown in a discriminant analysis (Van Wyk 1983).

It is this rather intermediate group of populations that previously led to uncertainty regarding the status of the two species of *Virgilia*. The delimitation of the two species is further complicated by cultivated trees, which may show a confusing combination of characters, indicating that hybridization is possible when the two species are grown in close proximity. Although peak flowering periods differ, some flowers are usually present throughout spring and summer in all three taxa. The geographical and seasonal isolation appears to be the only mechanism preventing interbreeding. The latter (flowering time) is only absolute in the natural distribution range, where the pollinators (large xylocopid bees) operate over distances of only a few kilometers at the most.

It is not known which alkaloids are present in this subspecies. Virgilinepyrrol-carboxylic acid was found in *V. divaricata* but not in *V. oroboides* subsp. *oroboides* (Van Eijk pers. comm.).

#### Specimens examined

— **3322** (Oudtshoorn): Robinson Pass, Outeniqua Mountains (–CC), *Hops 51* (BOL); *Taylor 1* (GRA); Ruytersbosch (–CC), *Van Niekerk 63* (BOL); Montagu Pass (–CD), *Burt Davy s.n. sub PRE 12591* (PRE); *Compton 7386* (NBG, holo.; BOL, iso.), *7587* (NBG); *Van Wyk 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 958, 960, 961(a), 961(b)* (FFS); *Wall s.n.* (S); Montagu Pass, Cradock slopes (–CD), *Zinn s.n. sub SAM 54837* (SAM); Outeniqua Pass (–CD), *Barker 7661* (NBG); Outeniqua Pass, near top (–CD), *Van Wyk 956, 957* (FFS); Groenkop Plantation, George (–DC), *Grey 15* (FFS); Kaaimans River, 11 km from George (–DC), *Van Wyk 416, 417* (FFS); Saasveld, George (–DC), *Anon 2* (FFS); *Van Wyk 460* (FFS).

— **3422** (Mossel Bay): Victoria Bay (–BA), *Compton 15790* (NBG); *Van Wyk 404, 405, 406, 408, 409, 410, 411* (FFS).

2. *Virgilia divaricata* Adamson In J. Bot., Lond. 72:43 (1934); Palmer & Pitman, Trees S. Afr. 2:903 (1973).

TYPUS. — Cape Province: 'Seven Weeks Poort', Ladismith, *Pocock 1018* (BOL, holotypus!).

*V. capensis* Lam. *sensu* Pole Evans, Flower. Pl. S. Afr. 8: t. 305 (1928).

Small tree, 4–8(–16) m tall, basal diameter of trunk up to 0.6 m. *Bark* smooth. *Young parts* glabrescent. *Pinnae* in (2–)7–9(–16) pairs, linear to narrowly ovate; glabrescent

at maturity or pubescent along the abaxial midrib only; apex rounded, truncate or emarginate; mucro very small, up to 1 mm long. *Stipules* (2–)4–6(–10) mm long, (0,5–)1(–2) mm wide. *Inflorescence* a raceme, often congested and umbel-like, all flowers opening  $\pm$  simultaneously. *Bracts* small, acicular, linear or lanceolate, 2–5  $\times$  0,5–3 mm, falling before buds are 5 mm long. *Flowers* rose-violet or violet-purple (rarely pale pink but then the beak dark purple); pedicels (4–)8–12(–21) mm long, velvety, bracteoles inconspicuous or absent. Nectar guide at base of vexillum prominent. Pollen guide on beak dark purple. *Pods* up to 12 mm wide. *Seeds* small, (30–)35–45(–55) mg each.

The specific epithet refers to the spreading branches of this species, the primary branches often at right angles to the main trunk. In *V. oroboides* the branches are usually ascending, forming an angle of 30–40 degrees between the primary branches and trunk. This character is best seen in young trees, but varies between different populations and is not of much diagnostic value.

Flowering period — August to January, with a peak in October.

#### Diagnostic characters

*Mature pinnae* glabrescent or pubescent abaxially along the midrib only, the apices rounded, truncate or emarginate. *Bracts* small, 2–5  $\times$  0,5–3 mm, falling before buds are 5 mm long. *Bracteoles* absent or inconspicuous. *Seeds* small (30–)35–45(–55) mg each.

#### Natural distribution

Limited to the eastern part of the distribution area of the genus, from George to Port Elizabeth (Figure 2) and very frequent along the southern Cape- and Tsitsikamma coastal plain and mountains. The population at Ladismith (type locality) is rather isolated, but similar forms of the species occur in the northern (drier) localities, e.g. the Langkloof area. The species is extremely variable, and at least two other forms may be distinguished: around Baviaanskloof and Port Elizabeth (pale pink flower with dark purplish-red pollen guide) and the widespread Tsitsikamma and southern Cape form (rose-violet or violet-purple flower, with dark purple pollen guide).

#### Specimens examined

— **3321** (Ladismith): Amalienstein (–AD), *Nel s.n. sub STEU 9594* (STE); Seven Weeks Poort (–AD), *Barker 20608* (BOL); *Bayliss 6274* (PRE); *Compton s.n. sub NBG 751/33* (NBG); *Compton 7385* (NBG); *Levyns 2416* (BOL); *Phillips 1428* (SAM), *Pocock 1018* (BOL, holo.); *C.M. van Wyk 360* (STE); *Van Wyk 591, 592, 593, 594, 595, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888* (FFS); *Wurtz 1164* (NBG); Garcia's Pass, probably introduced (–CC) *Van Wyk 692, 693, 694, 893(a), 893(b), 894* (FFS).

— **3322** (Oudtshoorn): Outeniquakruis (–DC), *Zeeman 50* (PRE); Karatara (–DD), *Keet s.n. sub STEU 13656* (STE); 91 km from Joubertina to George, river valley (–DD), *Stirton 6329* (PRE).

— **3323** (Willowmore): Deepwalls, Knysna (–CC), *Bos 764* (PRE); *Wicht 7* (FFS); Die Vlugg, along Keurbooms River (–CC), *Van Wyk 445, 446, 447, 448, 449* (FFS); Gouna River (–CC), *Keet s.n. sub STEU 13655* (STE); Keurdraaibos, 30 km from turnoff to Avontuur (–CC), *Van Wyk 440, 441, 442, 443, 444* (FFS); Prince Alfred's Pass (–CC), *Acocks & Hafström 730* (PRE; S); *Van Wyk 929* (FFS); Keurbooms River (–CD), *Schonland 3454* (GRA); The Craggs, Knysna (–CD), *Barker 6034* (NBG); *Van Wyk 685, 686* (FFS); Wadrifhoogte, 7 km from turnoff to Avontuur (–CD), *Van Wyk 437, 438, 439* (FFS); Willowmore, Van Niekerksberg (–CD), *Bayliss BRI. B. 6129* (PRE); Voorkloof, Joubertina/Kouga (–DA), *Geldenhuys 348* (STE); Braamfontein, Kouga Mountains (–DB), *Esterhuysen 16308* (BOL); Bloukrans Pass (–DC), *Van Wyk 678,*

*679* (FFS); Grootrivier Pass (–DC), *Van Wyk 682, 683, 684* (FFS); Helpmekaar Peak, Uniondale (–DC), *Esterhuysen 4660* (BOL, PRE); Louterwater, Uniondale (–DC), *Compton 10490* (BOL, NBG); Blueiliesbush (–DD), *Van Wyk 667, 668, 669, 670* (FFS); De Hoek, Joubertina (–DD), *Esterhuysen 10587* (BOL); Joubertina (–DD), *Esterhuysen 6857* (BOL); Paul Sauer Bridge, Storms River (–DD), *Van Wyk 671, 672, 673, 674* (FFS); Storms River (–DD), *Basson 18* (STE); *Liebenberg 7905* (GRA, PRE, S); *Sidey 1704* (S); Tsitsikamma Mountains (–DD) *Britten 1002* (PRE).

— **3324** (Steytlerville): Elands River (–CC), *Schonland 3664* (GRA, PRE); Assegaibos (–CD), *Breyer 23318* (PRE); Between Assegaibos en Witelsbos (–CD), *Thode A 2533* (PRE); Kareedouw (–CD), *Thode A 818* (PRE); Baviaanskloof (–DA), *Bayliss BRI. B. 220* (PRE), *6910* (S); Between Cambria and Smitskraal, along White River, Baviaanskloof (–DA), *Van Wyk 633, 634, 635, 652, 653, 654, 655* (FFS).

— **3325** (Port Elizabeth): Groendal, Uitenhage (–CA), *Long 1163* (GRA, PRE); *Scharf 1137* (PRE); Springfields, Swartkops River (–CB), *Forestry Department 141* (GRA); *Ecklon & Zeyher s.n., pro parte* (S); Loerie (–CC), *Dix 174* (GRA, PRE); Van Stadens Nature Reserve (–CC) *Dahlstrand 3233* (PRE); Vanstadens Pass (–CC), *Paterson 864* (GRA); *Theron 567* (PRE); *Troughton 258* (GRA); *Van Wyk 656, 657* (FFS); Vanstadens River (–CC), *H. Bolus 1546* (BOL); *MacOwan 1057* (GRA); Swartkop's River, Uitenhage (–CD), *Zeyher 2253(a)* (SAM), *2253* (PRE); Bakens River Valley, Settlers Park, Port Elizabeth (–DC), *Troughton 47* (GRA, PRE).

— **3326** (Grahamstown): Hofmansbos (–AC), *Britten 1002* (GRA); Howieson's Poort near Grahamstown (–AD), *Bayliss BRI. B. 1024* (PRE).

— **3422** (Mossel Bay): Belvedere (–BB), *Duthie s.n. sub STE 29685* (STE); Groenvlei, at turnoff to Karatara (–BB), *Van Wyk 418, 419, 420, 421, 422, 423, 424, 425, 426, 690* (FFS).

— **3423** (Knysna): Knysna (–AA), *Forestry Department s.n.* (STE); *Breyer s.n. sub PRE 22217* (PRE); *Keet s.n. sub PRE 52972* (PRE); Melkhout Kraal (–AA), *Burchell 5366* (S); Harkerville (–AA), *Van Wyk 427, 428, 429, 430, 431, 432, 433, 434, 435* (FFS); Keurbooms River (–AB), *Gillet 4551* (BOL, PRE); *Kapp 5* (PRE); *Keet s.n. sub STEU 13654* (STE); *Schonland 3454* (PRE); *Van Wyk 436* (FFS); Keurbooms River Pass (–AB), *Rycroft 2614* (NBG); Plettenberg Bay (–AB), *Britten A 69* (GRA); *Leipoldt s.n. sub BOL 17094* (BOL); *Smart s.n. sub Herb. F.A. Rogers 26766* (STE); *Smart s.n. sub Herb. F.A. Rogers 28477* (GRA, PRE, STE); Loerie Trail, Tsitsikamma Coastal National park (–BB), *Botha & Coetzee 1636* (PRE).

— **3424** (Humansdorp): Hans Mei River (–AA), *Van Wyk 660, 661, 662, 664, 665, 666* (FFS); Witelsbos (–AA), *Fourcade 2356* (STE); Clarkson (–AB), *Thode A 819* (PRE).

Without locality: *Muir 2083* (PRE); *Van Niekerk s.n. sub BOL 24574* (UPS).

#### Acknowledgements

I am indebted to Prof J.J.A. van der Walt, Prof D.G.M. Donald and Dr P.J. Vorster for assistance and encouragement during the study; also to Mr E.G.H. Oliver for help with the Latin diagnosis.

#### References

- ADAMSON, R.S. 1934. Novitates Africanæ. *J. Bot.*, Lond. 72: 43.  
 ADAMSON, R.S. & SALTER, T.M. 1950. Flora of the Cape Peninsula. Juta, Cape Town.  
 AITON, W.T. 1812. Hortus Kewensis. 2nd edn, 2, 3 p. 4, Longman, London.  
 ANDREWS, H.C. 1812. Botanist's Repository 5: 347. London.  
 BENTHAM, G. 1838. De Leguminosarum Generibus Commentationes. *Ann. Wien. Mus.* 2: 86.  
 BENTHAM, G. & HOOKER, J.D. 1865. Genera Plantarum ad exemplaria imprimis in herbariis kewensis servata definita 1. Black, London.  
 BERGIUS, P.J. 1767. Descriptiones plantarum ex Capite Bonæ Spei. Stockholm.  
 COATES PALGRAVE, K. 1977. Trees of southern Africa. C. Struik, Cape Town.

- CURTIS, W. 1813. *Curtis's Botanical Magazine*. 38: t. 1590.
- DE CANDOLLE, A.P. 1825. *Prodromus systematis naturalis regni vegetabilis* . . . , 2. Treutel et Wurtz, Paris.
- DE LAMARCK, J.B.A.P.M. 1793. *Tableau encyclopédique et méthodique* 2,2. Chez Panckoucke, Paris.
- DYER, R.A. 1975. The genera of South African flowering plants. 1. Dicotyledons. Botanical Research Institute, Pretoria.
- ECKLON, C.F. & ZEYHER, C.L.P. 1836. *Enumeratio plantarum africae australis* 2. Hamburg.
- ENGLER, A. & PRANTL, K.A.E. 1894. *Die natürlichen Pflanzenfamilien* 3,3. Berlin.
- GERRANS, G., HARLEY-MASON, J. & WHITE, E. 1971. In: *Chemotaxonomy of the Leguminosae*, eds Harborne, J.B., Boulter, D. & Turner, B.L. Academic Press, London & New York.
- GOLDBLATT, P. 1981. Cytology. In: *Advances in legume systematics* 2, eds Polhill, R.M. & Raven, P.H. pp. 427–463, International Legume Conference, Royal Botanic Gardens, Kew.
- HARVEY, W.H. 1838. The genera of South African plants. 1st edn, A.S. Robertson, Cape Town.
- HARVEY, W.H. 1862. In: *Flora capensis* 2, eds Harvey, W.H. & Sonder, O.W. p. 266. Hodges, Smith & Co., Dublin.
- HUTCHINSON, J. 1964. The genera of flowering plants. Dicotyledons 1. Clarendon Press, Oxford.
- LINNAEUS, C. 1767. *Mantissa Plantarum*. Stockholm.
- MARLOTH, R. 1925. The flora of southern Africa. 2,1, p. 72. Darter Bros. & Co., Cape Town.
- MEYER, E.H.F. 1835. *Commentariorum de plantis Africae Australioris* 1. Regiomonti, Leipzig.
- PALMER, E. & PITMAN, N. 1973. *Trees of southern Africa* 2. A.A. Balkema, Cape Town.
- PAPPE, K.W.L. 1862. *Silva Capensis*. Ward & Co., London.
- PERSOON, C.H. 1805. *Synopsis plantarum* 1 p. 453. Paris.
- PHILLIPS, P.E. 1951. The genera of South African flowering plants, 2nd edn. *Mem. bot. Surv. S. Afr.* No. 25: 400.
- POIRET, J.L.M. 1808. In: *Encyclopédie méthodique* 8, ed. de Lamarck, J.B.A.P.M. Chez Panckoucke, Paris.
- POLE EVANS, J.B.P. 1928. *Virgilia capensis*. *Flower. Pl. S. Afr.* 8: t. 305.
- POLHILL, R.M. 1981. Tribe 27. Podalyrieae Benth. (1837). In: *Advances in legume systematics* 1, eds Polhill, R.M. & Raven, P.H. pp. 396–397, International Legume Conference, Royal Botanic Gardens, Kew.
- REHDER, A., WEATHERBY, C.A., MANSFELD, R. & GREEN, M.L. 1935. Conservation of later generic homonyms. *Kew Bull.* 341–544.
- RICKETT, H.W. & STAFLEU, F.A. 1959. Nomina Generica Conservanda et Rejicienda Spermatophytorum III. *Taxon* 8, 9: 282–314.
- SALTER, T.M. 1939. Some changes in nomenclature II. *Jl S. Afr. Bot.* 5: 58.
- SIM, T.R. 1907. The forests and forest flora of the Colony of the Cape of Good Hope. Taylor & Henderson, Aberdeen.
- SPRAGUE, T.A. 1940. Additional Nomina Generica Conservanda (Pteridophyta and Phanerogamae). *Kew Bull.* 81–134.
- THUNBERG, C.P. 1823. *Flora capensis*. 2nd edn, J.A. Schultes, Stuttgart.
- VAN EIJK, J.L. & RADEMA, M.H. 1982. Virgiboidine, A new alkaloid from *Virgilia oroboides* and *Virgilia divaricata*. *Planta med.* 44: 224–226.
- VAN WYK, B.-E. 1983. 'n Monografiese studie van die genus *Virgilia* Poir. M.Sc. thesis, Univ. of Stellenbosch.
- VON BREITENBACH, F. 1965. The indigenous trees of southern Africa 3. Department of Forestry, Pretoria.
- WILLDENOW, C.L. 1799. *Carolia Linné Species Plantarum* 2,1. Berlin.
- YAKOVLEV, G.P. 1970. A new subspecies of *Virgilia capensis* (L.) Poir. (Fabaceae). *Bot. Zhurn.* 55: 837.

