

FSA contributions 7: Verbenaceae†: *Vitex*

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Editor's note: this contribution duplicates most of the synopsis of the genus *Vitex* published by Bredenkamp & Botha (1993) before the column 'FSA contributions' was initiated in *Bothalia*. The synopsis lacks species descriptions and can therefore not be accepted as a direct contribution to the FSA.

## 7186000 VITEX

*Vitex* L. in *Species plantarum* 638 (1753) & *Genera plantarum* edn 5: 285 (1754); Adans.: 200 (1763); Juss.: 107 (1789); Lour.: 389 (1790); G.Mey.: 218 (1818); Roth: 516 (1821); Endl.: 635 (1836); Schauer: 682 (1847); Seem.: 190 (1865); Benth. & Hook.: 1135 (1876); C.B. Clarke: 583 (1885); Briq.: 170 (1894); Baker: 315 (1900); H. Pearson: 211 (1901); Hutch.: 309 (1926); W. Pieper: 1–91 (1928); Moldenke & A. Moldenke: 32 (1946); Moldenke: 142 (1955a); Moldenke: 186 (1955b); Moldenke: 13 (1957a); Moldenke: 70 (1957b); Moldenke: 129 (1958a); Moldenke: 197 (1958b); Moldenke: 21 (1961a); Melch.: 435 (1964); Merxm.: 9 (1967); Moldenke: 73 (1967a); Moldenke: 222 (1967b); Moldenke: 130 (1973); R.A. Dyer: 520 (1975); Moldenke: 216 (1979a); Moldenke: 328 (1979b); Verdc.: 50 (1992). Type: Mediterranean areas and central Asia. *V. agnus-castus* L. (Farr *et al.* 1979).

*Mailelou* Rheede ex Adans.: 200 (1763). *Limia* Vand. in Vand. *et al.*: 42 (1788). *Nephandra* Willd.: 8 (1790). *Allasia* Lour.: 84 (1790). *Tripinna* Lour.: 391 (1790). *Chrysomallum* Thouars: 8 (1806). *Pyrostoma* G.Mey.: 219 (1818). *Wallrothia* Roth: 317 (1821). *Ephialis* Banks, Sol. & A. Cunn.: 461 (1838). *Psilogyne* DC.: 132 (1838). *Casarettoa* Walp.: 91 (1844). *Macrostegia* Nees: 218 (1847).

Trees or shrubs. *Leaves* opposite, palmately compound with 3–5(7) pinnae, margins entire or seldom dentate; petiolule present or pinnae sessile. *Inflorescences* terminal, many-flowered racemes or axillary, determinate compound dichasia. *Flowers* bisexual, slightly zygomorphic or zygomorphic. *Calyx* persistent, enlarging during fruiting stage; tube campanulate, 5-lobed; lobes often reduced. *Corolla* with 5 lobes, bilabiate, mauve; lip with yellow markings at base; tube white, often curved and hairy externally as well as internally, infundibular or campanulate. *Androecium*: stamens 4, didynamous, epipetalous, exerted; filaments basally broadened and hairy; anthers dorsifixed, divergent, extrorse. *Gynoecium*: ovary superior, glabrous, scarcely hairy apically, or hairy in upper half, bicarpellous, 4-locular with a single orthotropous ovule per locule, with axile placentation; style terete, exerted.

*Fruit* a 4-loculed drupe, sessile on a firm, crateriform calyx, or a nut enveloped by an infundibular chartaceous calyx. *Seeds* 1–4, oblong to narrowly obovoid.

The genus *Vitex* has a world-wide, tropical to subtropical distribution, and comprises approximately 380 taxa (Verdcourt 1992). Pieper (1928) described 87 taxa from Africa and divided these into the subgenera *Vitex* and *Holmskioldiopsis* W. Pieper. Of the six southern African representatives of the subgenus *Vitex*, *Vitex ferruginea* Schumacher & Thonn. subsp. *amboniensis* (Gürke) Verdc., *V. angolensis* Gürke, *V. harveyana* H. Pearson, and *V. mombassae* Vatke have a mainly tropical distribution just extending southwards into southern Africa (*sensu* FSA). Apart from a few records from Zimbabwe and Mozambique, *V. pooara* Corbishley, and *V. patula* E.A. Bruce (subgenus *Vitex*) appear to be restricted to southern Africa. All members of the subgenus *Holmskioldiopsis* are endemic to southern Africa.

- 1a Calyx crateriform during fruiting stage (Figure 2), firm; fruit fleshy (drupe), globose or ellipsoid: Subgenus *Vitex*:  
 2a Gynoecium glabrous, or scarcely hairy at apex:  
 3a Flowers relatively large, 16–18 mm long; young stems ribbed . . . . . 1. *V. harveyana*  
 3b Flowers relatively small, 5–10 mm long; young stems not ribbed:  
 4a Adaxial surface of pinnae scarcely hairy, trichomes firm, imparting a rough feel to surface; fruit ellipsoid . . . . . 2. *V. patula*  
 4b Adaxial surface of pinnae pubescent, velvety; fruit globose . . . . . 3. *V. pooara*  
 2b Gynoecium velutinous in upper half:  
 5a Leaves palmate with three pinnae (occasionally five); pinnae sessile (petiolulate pinnae exclusively in Angola); median pinna widely obovate or widely elliptic . . . . . 6. *V. mombassae*  
 5b Leaves palmate with five pinnae (exceptionally seven); pinnae petiolulate; median pinna narrowly ovate, narrowly obovate or elliptic:  
 6a Adaxial leaf surface glabrous or scarcely hairy on venation; median pinna 55–142 mm long; petiolule 6–21 mm long . . . . . 4. *V. ferruginea* subsp. *amboniensis*  
 6b Adaxial leaf surface puberulent; median pinna 26–50 mm long; petiolule absent or up to 5 mm long . . . . . 5. *V. angolensis*  
 1b Calyx campanulate during fruiting stage (Figure 7), chartaceous; fruit dry (nut), obovoid: Subgenus *Holmskioldiopsis*:  
 7a Leaves with both surfaces of lamina macroscopically glabrous; median pinna narrowly oblong, narrowly elliptic or lanceolate . . . . . 7. *V. rehmannii*  
 7b Leaves with both surfaces of lamina hairy; median pinna oblong, elliptic, narrowly ovate or narrowly obovate:  
 8a Adaxial lamina surface densely velvety with white hairs; leaves greyish green . . . . . 8. *V. zeyheri*  
 8b Adaxial lamina surface glabrous or pubescent with white hairs; fresh leaves dark green . . . . . 9. *V. obovata*

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† Labiatae could be expanded to include the Viticoideae (Cantino 1992: 35).

## SUBGENUS VITEX

Subgenus *Vitex*

*Euvitex* W.Piep.: 29 (1928). According to Art 21(3) of the International Code (Greuter *et al.* 1994) *Euvitex* must be rejected.

*Flowers* with total length 6–18 mm, strong tendency towards zygomorphy. *Calyx* 5-lobed; lobes often reduced, 0.5–1.5 mm long. *Corolla* tube 3.8–10.0 mm long; lobes 5, dorsal lobes almost completely fused. *Ovary* globose or broadly flask-shaped, glabrous or hairy in upper half. *Fruit* a drupe, ellipsoid to globose, 10(–21) × 7(–21) mm, sessile on a persistent, firm, crateriform calyx.

Section *Axillares* Briq. emend. W.Piep. in *Botanische Jahrbücher* 62,3, Beiblatt 142: 30 (1928). Type: *V. ferruginea* Schumacher & Thonn. Ghana near Aquapim, Thonning 265 (C, syn., P-JU, isosyn.)

*Axillares* Briq.: 172 (1894).

1. *Vitex harveyana* H.Pearson in *Flora capensis* 5: 212 (1901); W.Piep.: 56 (1928); Moldenke: 40 (1961a); Compton: 66 (1966); Moldenke: 257 (1971a); Palmer & Pitman: 1951 (1973); Coates Palgrave: 808 (1977). Type: eastern region, banks of the higher Tugela River, *Gerrard & McKen 1250* (PRE, lecto.!, fide Bredenkamp & Botha (1993); K, photo.!).

*V. geminata* H.Pearson: 213 (1901); W.Piep.: 56 (1928); Moldenke: 257 (1971b). *V. harveyana* forma *geminata* (H.Pearson) Moldenke: 329 (1979b). Type: eastern region, Zululand, at the Umlasi River, *Gerrard & McKen 2027* (TCD, holo. photo.!, K!).

*V. schlechteri* Gürke: 299 (1904); W.Piep.: 56 (1928); Moldenke: 389 (1959); Moldenke: 727 (1971a). Type: Komatipoort, *Schlechter 11731* (Z, holo.!, E!, G!, GRA!, K, photo.!, P!, S!, W!).

Shrubs 2–3(–4) m high, many-stemmed with lax shoots; adventitious roots borne at nodes; young stems angular, striated, often ribbed; cork grey-brown, finely striated. *Leaves* palmately compound with 3–5 pinnae; petiole (10–)20–22(–39) mm long, adaxially grooved, abaxially convex, glabrous; petiolule (0–)6–7(–10) mm long, glabrous; median pinna (30–)53–55(–79) × (16–)23–24(–29) mm, elliptic to narrowly obovate; margin entire or toothed in upper half; dark green, surface shiny, waxy, adaxial surface glabrous, abaxial surface sparsely pubescent, glandular trichomes present. *Inflorescence* a compound dichasium, total length (30–)52–55(–85) mm; length of bracts at first branch of inflorescence (1–)3–4(–15) mm. *Pedicel* resupinating. *Flowers* zygomorphic, total length in lateral view 17 mm. *Calyx*: tube (4.0–)4.2–4.5(–5.0) mm; lobes reduced, 0.5 mm long. *Corolla* violet; tube 10–12 mm long; lobes in front view 22 × 17(–18) mm, dorsal lobes folded backwards parallel to tube. *Androecium*: longest pair of stamens 10–11 mm, shortest pair 9 mm long. *Ovary*: style 14 mm long. *Fruit* a fleshy drupe, sessile on a firm crateriform calyx, ellipsoid (5–)9–10(–12) × (4–)7–8(–9) mm, black when ripe.

*Distribution and habitat*: Mpumalanga, especially near Komatipoort, Swaziland, NE KwaZulu-Natal and Eastern Cape; also recorded from Angola and Mozambique (Fig-

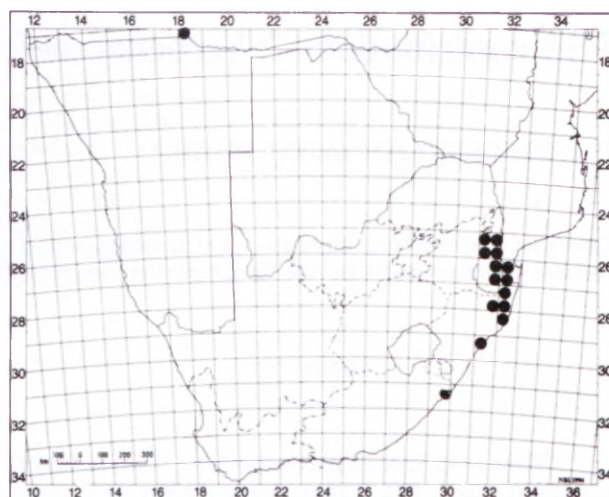


FIGURE 1.—Distribution of *Vitex harveyana* in southern Africa.

ure 1). Most frequently grows between rocks in sandy soil or on river and stream banks. *Flowering time*: October to December. *Common names*: Umbendula (Zulu); three-finger-leaf, three-finger vitex, whorled finger-leaf (English); driefvingerblaar, krantzvingerblaar, kransvingerblaar (Afrikaans). *Utilisation*: fruit edible from February to May.

Vouchers: *Bredenkamp 255* (PUC); *Codd 5242* (K, PRE, NH); *Gerstner 4212* (NH); *Rogers TM13278* (PRE, NH).

2. *Vitex patula* E.A.Bruce in *Bothalia* 6: 237 (1951); Moldenke: 44 (1957a); Moldenke: 40 (1961a); Moldenke: 317 (1967d); Moldenke: 258 (1971b); Palmer & Pitman: 1962 (1973); J.H.Ross: 300 (1972); Coates Palgrave: 809 (1977). Type: Transvaal [Northern Province], Zoutpansberg Dist., Kruger National Park, Dzundweni Hill, 11.5 miles SE of Punda Maria, *Codd 5319* (PRE, holo.!).

Multistemmed shrub (1.0–)2.4–4.0(–5.0) m high; cork grey-brown and striated; young stem hairy. *Leaves* palmately compound with 3–5 pinnae, frequently 3 pinnae present, arranged at right angles; petiole (26–)45–49(–112) mm long, sparsely tawny-pubescent; petiolule (2–)4–5(–9) mm long, sparsely tawny-pubescent; median pinna (39–)61–66(–144) × (17–)31–32(–60) mm, elliptic to narrowly obovate, margin entire or toothed in upper half, dark green, adaxial surface scabrous due to presence of macroscopical sturdy trichomes, abaxial surface sparsely hairy; chartaceous. *Inflorescence* a compound dichasium, total length (29–)59–62(–105) mm; length of bracts at first branch of inflorescence (4–)9–10(–22) mm. *Flowers* zygomorphic, total length (5.0–)6.0–7.0(–9.4) mm. *Calyx* enlarges during fruiting stage, (3.0–)3.2–3.4(–3.8) mm; lobes (0.5–)0.7–0.9(–1.28) mm long. *Corolla*: tube white, lobes mauve; tube (3.8–)4.0–5.0(–6.0) mm long; lobes in front view 8.0–8.5 × (6.0–) 6.5–7.0(–8.0) mm, held at right angles to tube. *Androecium*: longest pair of stamens 4.0–4.8 mm, shortest pair (3.6–)3.7–3.8(–4.0) mm, not exerted. *Ovary* glabrous; style (4.9–)5.0–5.1(–5.4) mm long. *Fruit* a fleshy drupe, sessile on a firm crateriform calyx, ellipsoid, (9.0–)11.0–12.0(–13.0) × (7.0–)7.5–8.0(–9.0) mm, black when ripe. Figure 2.



FIGURE 2.—*Vitex patula*: A, habit, reduced, height variable,  $\pm \times 0.01$ ; B, flowering branch,  $\times 0.5$ ; C, variation in leaf shape,  $\times 0.25$ ; D, fruiting inflorescence,  $\times 2$ ; E, side view of flower,  $\times 6$ ; F, flower face showing corolla lobes,  $\times 5$ . Drawn from *Bredenkamp 272* and *Botha 3969* (PRE). Artist: Gillian Condy.

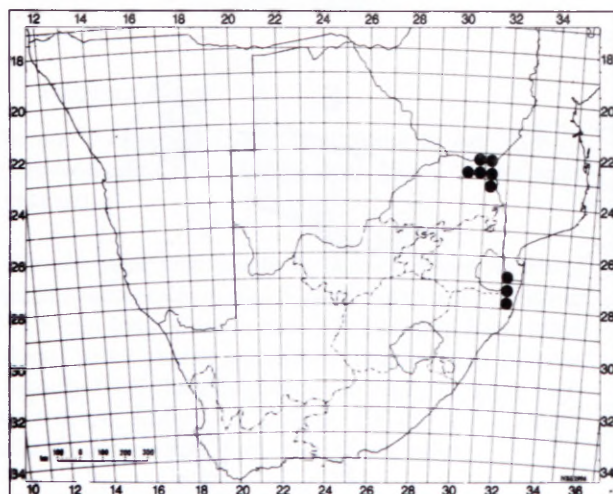


FIGURE 3.—Distribution of *Vitex patula* in southern Africa.

Ross (1972) and Von Breitenbach & Von Breitenbach (1995) treat *V. patula* as a synonym of *V. amboniensis* Gürke [see *V. ferruginea* Schumach. & Thonn. subsp. *amboniensis* (Gürke) Verdc. var. *amboniensis*]. Morphological and anatomical studies have shown that they are separate taxa (Bredenkamp 1988).

**Distribution:** NE parts of Northern Province, Venda, Kruger National Park and N KwaZulu-Natal; also in Mozambique (Figure 3). **Flowering time:** end of November to December.

**Vouchers:** Bredenkamp 247, 248 & 267 (PUC); Gomes & Sousa 3885 (PRE); Pooley 780, (NH); Van der Schijff 3343 (PRE).

3. ***Vitex pooara* Corbishley** in Kew Bulletin 10: 333 (1920); I. Verd.: 45 (1938); Moldenke: 89 (1957b); Moldenke: 388 (1959); Moldenke: 76 (1961b); Moldenke: 258 (1971b); Palmer & Pitman: 1953 (1973); Coates Palgrave: 810 (1977). Type: Transvaal [Northern Province], Modder Nek, Nylstroom, *I.B. Pole Evans 19671* (PRE, holo.!, K, photo.!).

Small to medium-sized trees, to 5 m high; branches spreading; cork grey-brown, incised, peels in strips; young stems tawny. **Leaves** palmately compound with 3–5 pinnae; petiole (27–)45–46(–63) mm long, sparsely tawny-pubescent; petiolule usually absent. Pinnae tawny at base; median pinna (39–)58–60(–75) × (16–)27–28(–37) mm, narrowly obovate, margin entire, yellow green to khaki, both ad- and abaxial surfaces are pubescent, glandular trichomes present on both surfaces; coriaceous. **Inflorescence** a compound dichasium, total length (34–)54–56(–84) mm; length of bracts at first branch of inflorescence (5–)7–8(–15) mm. **Flowers** zygomorphic, total length 6 mm. **Calyx:** tube 2 mm; lobes 0.5 mm. **Corolla:** tube strongly curved, 5 mm long, white; lobes in front view 8.5 × 8.0 mm, held at right angles to tube. **Androecium:** longest pair of stamens 4 mm, shortest pair 3.5 mm, not exerted. **Ovary** glabrous, sparsely pubescent at apex; style 4.5 mm long. **Fruit** a fleshy drupe, sessile on a firm crateriform calyx, spheroid or ellipsoid, (9–)14–15(–18) × (9–)12–13(–18) mm, black when ripe.

Bredenkamp (1988) has shown that *V. pooara* and *V. mombassae* Vatke are morphologically and taxonomically clearly defined and cannot be regarded as synonymous (Coates Palgrave 1977; Von Breitenbach & Von Breitenbach 1995). A study of the type material has also shown that *V. pooara* is related to the tropical *V. isotjensis* Gibbs (Corbishley 1920), but that these taxa are not conspecific.

**Distribution:** rare in North-West and Northern Provinces and Gauteng, found especially in the vicinities of Nylstroom, Thabazimbi and Rustenburg (Figure 4); also recorded for S Zimbabwe. **Flowering time:** end of November to December. **Common names:** pooar (Corbishley 1920); mphoer or mphuru, referring to the characteristic 'house-bug' odour (Theron 2049, PRE); hardekool, poerabessie, poera(s)boom, stinkbessie, weeluisbessie (Afrikaans); poora-berry, resin-leaf and wild cherry. **Utilisation:** Moldenke (1961b) mentions that the wood is not fit for utilisation. The fruit is eaten by the local people (Verdoorn 1938).

**Vouchers:** Bredenkamp 238 (PUC); Carlson in PRE1481 (PRE); Galpin 11652 (PRE); Westfall 1556 (PRE).

4. ***Vitex ferruginea* Schumach. & Thonn.**, Beskrivelse af Guineiske planter: 62 (1827); Baker: 324, 521 (1900); W.Piep.: 70 (1928); H. Huber in Huber et al.: 447 (1963); Hepper: 130 (1976). Type: Ghana near Aquapim, *Thonning 265* (C, syn., P-JU, isosyn.).

subsp. ***amboniensis* (Gürke) Verdc.** in Flora of tropical East Africa: 66 (1992). Type: East Africa, Amboni, *Holst 2578* (B, holo.†; HBG, iso.!, K, iso., photo.!).

Shrubs 2.5–3.0(–9.0) m high; multistemmed with long lax shoots; cork grey-brown, incised, peels in strips; young stems and growing points with tawny indumentum. **Leaves** palmately compound with 3–7 pinnae; petiole (36–)63–65(–125) mm long, tawny-pubescent; petiolule slender, (6–)11–12(–21) mm long, tawny-pubescent; median pinna (54–)80–87(–142) × (18–)30–31(–58) mm, elliptic to narrowly ovate, acute or obtuse, apex acute to acuminate, margin entire or toothed in upper half, yellow

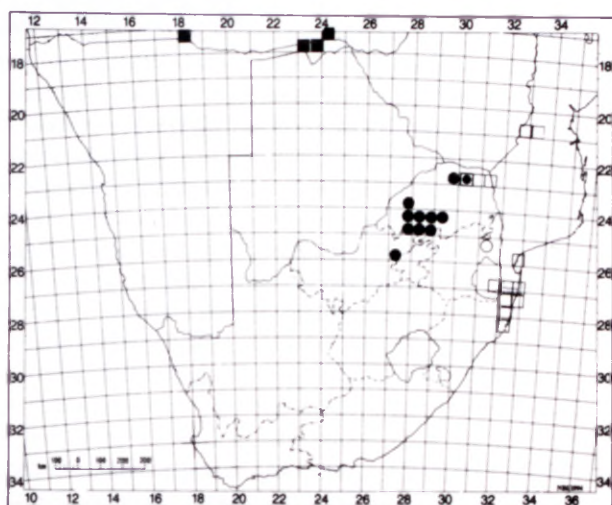


FIGURE 4.—Distribution of *Vitex pooara*, ●; *V. ferruginea* subsp. *amboniensis* var. *amboniensis*, □; *V. ferruginea* subsp. *amboniensis* var. *amaniensis*, ○; *V. angolensis*, ■, in southern Africa.

to dark green, adaxial surface glabrous to sparsely pubescent, abaxial surface yellowish pubescent, glandular trichomes present; softly chartaceous. *Inflorescence* a compound dichasium, total length (16–)31–32(–50) mm, tawny-pubescent; length of bracts at first branch of inflorescence (5–)9–10(–15) mm. *Flowers* zygomorphic, total length 14–15 mm. *Calyx*: tube (3.0–)3.5–4.0(–5.0) mm long; lobes 0.5–1.5 mm long. *Corolla*: tube white, lobes and lip mauve, older flowers cream-coloured; tube strongly curved, (8.0–)8.5–9.5(–10.0) mm long; lobes in front view (15–)16–17(–19) × 11–12 mm, dorsal lobe folded backwards, parallel to tube. *Androecium*: longest pair of stamens (8.0–)9.0–9.7(–10.0) mm, shortest pair (6.0–)7.0–7.2(–8.0) mm, not exerted. *Ovary* velutinous in upper half; style 6.4–10.0 mm long. *Fruit* a fleshy drupe, sessile on a firm crateriform calyx, spheroid or ellipsoid (18–)20–21(–22) × (15–)20–21(–23) mm, purplish black when ripe.

Two varieties can be distinguished:

- 1a Adaxial surface of pinnae glabrous or scarcely hairy; apex acute, acuminate or characteristically cuspidate . . . . .  
 . . . . . 4a. var. *amboniensis*  
 1b Adaxial surface of pinnae puberulent; apex rounded to acute and not acuminate . . . . . 4b. var. *amaniensis*

#### 4a. var. *amboniensis*

*V. amboniensis* Gürke: 340 (1895); Baker: 329 (1900); Sim: 94 (1909); Moldenke: 204 (1955b); Moldenke: 380 (1959); Moldenke: 28 (1961a); Dale & Greenway: 539 (1961); Moldenke: 227 (1967b); Moldenke: 496 (1968a); Van der Schijff: 81 (1969); Moldenke: 257 (1971b); Palmer & Pitman: 1955 (1973); Coates Palgrave: 807 (1977); Moldenke: 361 (1979b).

*V. tangensis* Gürke: 339 (1895); Baker: 321 (1900); W.Piep.: 68 (1928). Type: Tanzania, Tanga, *Volkens* 92 (B, holo.†).

*V. amboniensis* Gürke var. *schlechteri* W.Piep.: 69 (1928); Moldenke: 120 (1949); Moldenke: 206 (1955b); Moldenke: 89 (1967a). Type: East Africa, Lourenço Marques [Mozambique, Maputo], *Schlechter* 11715 (BOL, iso.; GRA!).

*V. polyantha* Baker: 321 (1900). Type: Kenya, Mombassa, *Wakefield* (K, holo.).

*V. laevigata* Baker: 330 (1900); W.Piep.: 69 (1928). Type: German East Africa: Usaramo; Dar-es-Salaam [Tanzania] *Kirk s.n.* (K, holo. photo!).

*V. swynnertonii* S.Moore: 168 (1911); W.Piep.: 70 (1928). Type: Mozambique, Gazaland, *Swynnerton* 1054 (BM, holo.!).

Distinguished from var. *amaniensis* by the characters given in the key above.

*Distribution and habitat*: Venda in Northern Province, NE Kruger National Park (especially at Nwambiya), Swaziland and NE KwaZulu-Natal; also Mozambique (Figure 4). This plant occurs sympatrically with *V. patula* in deep sand in sand forests. *Flowering time*: *V. ferruginea* subsp. *amboniensis* var. *amboniensis* and *V. patula* are sympatric species, but the former flowers in early and the latter in late December. Fruits ripen in May. *Common names*: mufudu (Gir.) (Gürke 1895; Dale & Greenway 1961); miahali (Watt & Breyer-Brandwijk 1962); mupfumbu-pfumbu (V) (Palmer & Pitman 1972); large-fruited vitex, Amboni vitex, plum finger-leaf (English); pruumvingerblaar, (Afrikaans). *Utilisation*: Watt & Breyer-Brandwijk (1962) mentions that the plant is used as a remedy against snakebite by the Swahili. The fruit is not edible (Palmer & Pitman 1972).

Vouchers: *Balsinhas* 242 (PRE); *Bredenkamp* 268 (PRE, PUC); *Carvalho* 671 (PRE); *Codd* 5434 (PRE, SRGH); *Van Wyk* 4015 (PRE, PRU); *Ward* 2731 (PRE, NH).

4b. var. *amaniensis* (W.Piep.) Verdc. in Flora of tropical East Africa: 67 (1992); W.Piep.: 69 (1928); Moldenke: 206 (1955b); Moldenke: 29 (1961a). Type: East Africa, Amani, *Institut Amani* 221a (B, holo.†).

Distinguished from var. *amboniensis* by the characters given in the key above.

*Distribution and habitat*: only known from the Kruger National Park (Mpumalanga) at Numbi, and Shabeni Hill near Pretoriuskop, where the shrub was found at the foot of the massive rocky summit of the hill (Figure 4). *Flowering time*: flowers were scarce but could still be found in the beginning of February.

Vouchers: *Bredenkamp* 225 (PRE, PRU); *Van der Schijff* 152 & 740 (PRE, KNP).

5. *Vitex angolensis* Gürke in Botanische Jahrbücher 18: 167 (1893); Baker: 325 (1900); Hiern: 835 (1900); W.Piep.: 70 (1928); Gossw.: 382 (1953); Moldenke: 207 (1955b); Moldenke: 98 (1967a); Moldenke: 227 (1967b). Type: Angola, *Welwitsch* 5758 (BM, holo.!, K!, LISC!).

Shrubs 1.5(–3.0) m high, multistemmed and well branched; cork grey-brown, incised, peels in strips; young stems and growing points with tawny indumentum. *Leaves* palmately compound with 3–7 pinnae; petiole (13–)34–37(–54) mm long, tawny-pubescent; petiolule slender, (0–)2–3(–5) mm long, tawny-pubescent; median pinna (26–)40–41(–55) × (12–)18–20(–24) mm, elliptic to narrowly obovate, apex acute or obtuse, margin entire or irregularly toothed in the upper half, yellow to dark green, ad- and abaxial surfaces yellowish pubescent, glandular trichomes present; softly chartaceous. *Inflorescence* a compound dichasium, total length (29–)31–33(–41) mm, tawny-pubescent; length of bracts at first branch of inflorescence (5.0–)5.8–6.0(–7.0) mm. *Flowers* zygomorphic, total lateral length 11 mm. *Calyx*: tube 4.5–5.0 mm long; lobes 1.0–1.5 mm long. *Corolla*: tube strongly curved, 9–10 mm long; lobes in front view 12.0(–13.5) × 9.0 mm, not folded backwards against tube. *Androecium*: longest pair of stamens 8 mm, shortest pair 6 mm, not exerted. *Ovary* velutinous in upper half; style 10 mm long. *Fruit* a fleshy drupe, sessile on a firm crateriform calyx, spheroid or ellipsoid, (13–)17–18(–25) × (9–)14–15(–23) mm, purplish black when ripe.

*Distribution and habitat*: Kuring-Kuru in Namibia, and E Caprivi (Figure 4); also from Angola, especially at Huila. This plant and *V. mombassae* grow sympatrically in deep sand. Flowering time seems to be the isolating mechanism between these taxa, as *V. angolensis* flowers earlier than *V. mombassae*. *Flowering time*: December to mid-January. Fruits ripen between May and June. *Common names*: Gossweiler (1953) mentions that the name *muvomba* (Ganguela) is used in the Vila da Ponte [Kuvango]; according to information obtained from herbarium specimens, the names *mufilo* and *mumpula* are also used.

Vouchers: *Bredenkamp* 296 (PUC); *Geldenhuis* 321 (PRE); *Jankowitz* 1334 (PRE, WIND).

6. *Vitex mombassae*\* *Vatke* in *Linnaea* 43: 533 (1882); *Gürke*: 339 (1895); *Baker*: 326 (1900), pro parte; *Th.Dur. & H.Dur.*: 437 (1909); *W.Piep.*: 66 (1928); *Moldenke*: 120 (1949); *Gossw.*: 381 (1953); *Moldenke*: 383 (1959); *Dale & Greenway*: 597 (1961); *Moldenke*: 47 (1961a); *Moldenke*: 12 (1968b); *Moldenke*: 717 (1971a); *Verdc.*: 155 (1989); *Verdc.*: 63–64 (1992). Type: Kenya, prope Mombassa in ora Zanzibarensi [near Mombassa, on the Zanzibar Coast], *Hildebrandt* 1972 (B, holo.†; BM, iso.!, K, iso.!).

*V. flavescens* *Rolfe*: 87 (1893); *Baker*: 321 (1900); *Moldenke*: 383 (1959); *Merxm.*: 122 (1967); *Moldenke*: 717 (1971a). Syntypes: Malange, *S. Marques* 8; Angola, *Welwitsch* 5731 (BM!, K!, P!).

*V. mechowii* *Gürke*: 167 (1893); *Hiern*: 834 (1900); *Moldenke*: 386 (1959); *Moldenke*: 722 (1971a). Syntypes: Angola, *Welwitsch* 5731 (BM!, K!, P!); Malange, *Mechow* 247 (B, †).

*V. goetzei* *Gürke*: 464 (1900); *Baker*: 521 (1900); *Moldenke*: 383 (1959); *Moldenke*: 718 (1971a). Type: Sansibar-Küstengebiet: in der Steppe südlich des Rufidji [Zanzibar coastal region in the steppe south of the Rufidji], *M. Goetze* 85 (B, holo.†; K, iso.!).

*V. shirensis* *Baker*: 326 (1900); *Moldenke*: 389 (1959); *Moldenke*: 727 (1971b). Syntype: *Buchanan* 231, fide *Verdcourt* (1992).

*V. mufutu* *De Wild.*: 142 (1914); *Moldenke*: 386 (1959); *Moldenke*: 723 (1971a). Type: Ober-Katanga, Etoile du Congo [Zaire]. No collector or number mentioned.

*V. mombassae* *Vatke* var. *acuminata* *W.Piep.*: 68 (1928); *Moldenke*: 267 (1967c). Type: Britisch-Ost-Afrika [Kenya] *Battiscombe* 2 (K, holo.!).

*V. mombassae* *Vatke* var. *parviflora* (*Gibbs*) *W.Piep.*: 68 (1928); *Moldenke*: 717 (1971a). *V. flavescens* *Rolfe* var. *parviflora* *Gibbs*: 463 (1906); *Gibbs*: 459 (1916). Type: Hab. Victoria Falls, veld, *Gibbs* 135 (BOL, holo.!, BM!, SAM!).

Shrubs 2–3 m high; multistemmed and well branched; cork grey-brown, incised, peels in strips; young stems and growing points with tawny indumentum. *Leaves* palmately compound with 3–5 pinnae; petiole (23–)48–50 (–88) mm long, tawny-pubescent; petiolule usually absent, 0–1.5 (–11) mm long, tawny pubescent; median pinna (37–)60–65 (–108) × (19–)35–40 (–65) mm, broadly obovate, base acute to obtuse, apex obtuse, rounded or mucronulate, margin entire, yellow green, ad- and abaxial surfaces yellowish pubescent, glandular trichomes present, chartaceous to coriaceous. *Inflorescence* a compound dichasium, total length (31–)57–62 (–125) mm, tawny-pubescent; length of bracts at first branch of inflorescence (3–)9–10 (–22) mm. *Flowers* zygomorphic, total length 11 mm. *Calyx*: tube 4 mm long; lobes 1.5 mm long. *Corolla*: tube strongly curved, 8 mm long; lobes in front view 16 × 11 mm, folded backwards against tube. *Androecium*: longest pair of stamens 9 mm, shortest pair 8 mm, exserted. *Ovary* velutinous in upper half; style 10 mm long. *Fruit* a fleshy drupe, sessile on a firm crateriform calyx, spheroid or ellipsoid (8–)18–20 (–33) × (10–)15–16 (–31) mm, purplish black when ripe.

*Pieper* (1928) mentioned the occurrence of *V. mombassae* var. *erythrocarpa* (*Gürke*) *W.Piep.* in Livingstone,

\*Until recently the correct name for this taxon was *Vitex payos* (*Lour.*) *Merr.* (*Verdcourt* 1989, 1992). However, since this name has been conserved with a new type (*Nicolson & Brummitt* 1994), the correct name is *V. mombassae* *Vatke*.

Zambia. This variety does not seem to extend into southern Africa and no material of it was seen.

*Distribution and habitat*: N Namibia; also in Angola, Zimbabwe and Mozambique (Figure 5). *V. mombassae* and *V. angolensis* are sympatric species growing in deep sand. *Flowering time*: December to early January. Fruits ripen in May. *Common names*: lufuka (*Durand & Durand* 1909); mfudumaji (Swa.); mfududu (Gir.); mfudukoma (Dig.); mkufu (San.); mkalijote (Bon.) (*Dale & Greenway* 1961); muxilo-xilo (Kimbundu) (*Gossweiler* 1953); mwvumdu mazi (*Taylor* 1886, PRE); mushembere and mbukushu (*De Winter & Marais* 4769, PRE). *Utilisation*: fruit is edible.

Vouchers: *Bredenkamp* 299 (PUC); *De Winter & Marais* 4796 (PRE, WIND); *Hornby* 2342, 2752 (PRE) N Mozambique; *Mendonça* 869 (LISC) Angola.

#### SUBGENUS HOLMSKIOLDIOPSIS

Subgenus *Holmskioldiopsis* *W.Piep.* in *Botanische Jahrbücher* 62,3, Beiblatt 142: 30 (1928). Type: *V. obovata* *E. Mey.*, in valle inter Komga et Kei [in a valley of the Kei Rivier, near Komga] *Drège* s.n. (K!, BM!, G!, MO!, OXF!, P!, S!).

*Flowers* with total length 6–10 mm, regular. *Calyx* 5-lobed, lobes 1.5–3.5 mm long; tube 3–4 mm long; external surface glandular pubescent, internal surface glandular. *Corolla*: tube straight 6–9 mm long; lobes 5, front view of lobes 10.0–11.0 × 6.0–6.5 mm, situated at right angles to tube; tube white, lobes mauve. *Androecium* didynamous, longest pair of stamens 6 mm and shortest pair 5 mm, exserted. *Ovary* globose or obovoid, hairy and white glandular in upper half; style 6–9 mm long. *Fruit* dry, obovoid, 3 × 4 mm, sessile in base of a persistent, chartaceous, campanulate calyx.

7. *Vitex rehmannii* *Gürke* in *Bulletin de l'Herbier Boissier* 4: 818 (1896); *H.Pearson*: 214 (1901); *Galpin*: 23 (1923); *W.Piep.*: 74 (1928); *Hutch.*: 335 (1946); *Moldenke*: 122 (1949); *Moldenke*: 112 (1957b); *Moldenke*:

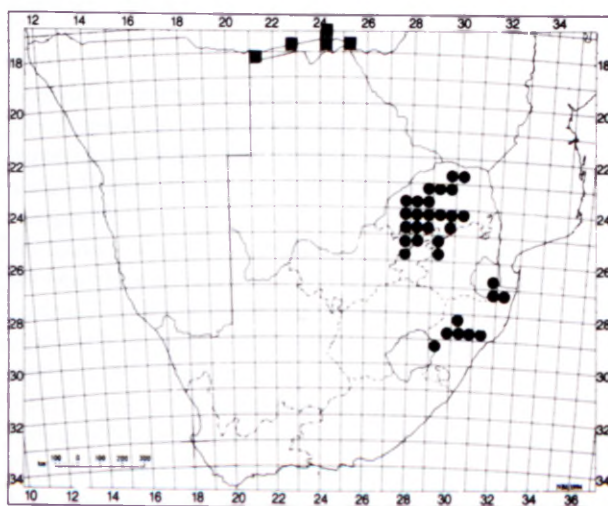


FIGURE 5.—Distribution of *Vitex mombassae* (subgenus *Vitex*), ■; *V. rehmannii* (subgenus *Holmskioldiopsis*), ●, in southern Africa.

388 (1959); Moldenke: 78 (1961b); Moldenke: 34 (1968b); Moldenke: 258 (1971b); Palmer & Pitman: 1957 (1973); Coates Palgrave: 811 (1977). Type: Transvaal [Northern Province], Makapansberg Mtns, Strydpoort, *Rehmann* 5422 (Z, holo.; BM!, K!).

Trees (2-)3-4(-9) m high; single-stemmed and well branched; cork dark grey-brown, fissured, rough, tessellate; young stems and growing points glabrous or sparsely white-pubescent. *Leaves* palmately compound with 3-5 pinnae; petiole (9-)30-35(-55) mm long, glabrous or sparsely white-pubescent; petiolule slender, (0-)5-6(-18) mm long, sparsely hairy; median pinna (34-)60-65(-135) × (9-)17-18(-31) mm, narrowly oblong, narrowly elliptic or lanceolate, apex as well as base acute, margin entire or toothed in upper half; yellow green to khaki; adaxial surface glabrous to sparsely pubescent, glandular, abaxial surface sparsely pubescent and glandular; chartaceous. *Inflorescence* a compound dichasium, total length (35-)45-60 (-95) mm, sparsely white-pubescent; length of bracts at first branch of inflorescence (1-)9-10(-22) mm. Description of flowers and fruit as for subgenus.

*Distribution and habitat*: North-West, Gauteng, Northern Province (particularly common in the Waterberg area) and Mpumalanga, Swaziland and KwaZulu-Natal (Figure 5). These plants grow mainly in frost free areas, and a clear discontinuity is visible in the distribution of this taxon from the northern provinces to KwaZulu-Natal. *V. rehmannii* frequently grows on quartzite ridges, on sandstone and also in deep sand. *Flowering time*: December to February. Fruits ripen in April. *Common names*: mokoele (Sesuto) (Galpin 1923); manohani (Shangaan); umduli, umluthu (Z); mokwele (NS) (Palmer & Pitman 1972); pipe-stem tree (English); pypsteelboom, vaalbos (Afrikaans). *Utilisation*: Galpin (1923) describes the wood as yellow-grey and of medium hardness as well as weight. The grain is straight, short and of reasonable strength; the wood is easy to work with and gives a beautiful finish; it is not infested by termites after utilisation but it is seldom used due to the availability of stronger wood types. The local people use it to produce stools. The young stems are hollow and used to make pipe stems.

Vouchers: *Bredenkamp* 200, 285 (PRE, PUC); *Galpin* M.282 (PRE); *Meeuse* 9491 (topotype) (MO, PRE, SRGH); *Wood* 6794 (NH, PRE).

8. *Vitex zeyheri* Sond. ex Schauer in A.P. De Candolle, *Prodromus systematis naturalis regni vegetabilis* 11: 639 (1847); Kuntze: 258 (1898); H.Pearson: 216 (1901); W.Piep.: 74 (1928); Moldenke: 122 (1949); Moldenke: 230 (1958b); Moldenke: 154 (1959); Palmer & Pitman: 1959 (1973); Coates Palgrave: 812 (1977). Type: in ripis flum. Crocodillorum in inter. Afric. austr. [North-West: on the banks of the Crocodile River], *Burke & Zeyher* 73 (K, holo., photo.; BM!, PRE!, SAM!).

*V. zeyheri* Sond. ex Schauer var. *brevipes* H.Pearson: 216 (1901); W.Piep.: 74 (1928); Moldenke: 122 (1949); Moldenke: 231 (1958b); Moldenke: 154 (1959). Type: Transvaal [North-West], Magaliesberg near Crocodile River, *Zeyher* 1369 (BOL, holo.; BM!, G!, K!, OXF!, P!, SAM!, S!, W!).

*V. rehmannii* Gürke forma *subtomentosa* Moldenke: 20 (1954); Moldenke: 113 (1957b); Moldenke: 154 (1959); Moldenke: 79 (1961b); Moldenke: 34 (1968b); Moldenke: 258 (1971b). Type: Transvaal [Gauteng]: Wonderboom Nature Reserve, Pretoria, *Repton* 2781 (PRE, holo.).

Trees (2.5-)3.0-4.0(-6.0) m high; single-stemmed, diameter (120-)200-225(-250) mm; cork dark grey-brown, fissured, rough, tessellate; young stems and growing points glabrous or sparsely white-pubescent. *Leaves* palmately compound with 3-5 pinnae; petiole (10-)25-30 (-41) mm long, white-tomentose; petiolule (0-)2-3(-5) mm long, white-tomentose; median pinna (36-)55-60 (-78) × (10-)28-30(-41) mm, oblong, elliptic, narrowly ovate or narrowly obovate, grey-green, base acute, apex acute, obtuse or rounded, margin entire or toothed in upper half, ad- and abaxial surfaces white-tomentose and glandular; chartaceous. *Inflorescence* a compound dichasium, total length (34-)55-60(-81) mm, white-tomentose; length of bracts at first branch of inflorescence (4-)11-12(-25) mm. Description of flowers and fruit as for subgenus.

*Distribution and habitat*: endemic to Gauteng, North-West and Botswana (Figure 6). These plants grow mainly in stony soil on south and east facing slopes of the Magaliesberg Mountains and associated ridges. In the Zeerust District it was found on shale, but it occurs on dolomite in the vicinity of Pretoria and Marico. *Flowering time*: December and January, occasionally up to March. Fruits ripen in April and May. *Common names*: mokwele (Tsw) (Palmer & Pitman 1972); silver pipe-stem tree (English); vaalpypsteelboom en vaalbos (Afrikaans).

Vouchers: *Bredenkamp* 91 (PUC); *Hutchinson* 2927 (GRA, PRE); *Phillips* 558 (PRE); *Pole Evans* H18060 (PRE).

9. *Vitex obovata* E.Mey., *Commentariorum de plantis Africae australioris*: 273 (1835); Walp.: 87 (1844); Schauer: 693 (1847); H.Pearson: 214 (1901); Sim: 287 (1907); W.Piep.: 74 (1928); Moldenke: 23 (1957a); Moldenke: 154 (1959); Moldenke: 312 (1967d); Moldenke: 258 (1971b); Palmer & Pitman: 1961 (1973); Coates Palgrave: 810 (1977). Type: in valle inter Komga et Key [in a valley of the Kei River near Komga], *Drège* s.n. (K, holo.; BM!, G!, MO!, OXF!, P!, S!).

*V. reflexa* H.Pearson: 215 (1901); W.Piep.: 74 (1928); Moldenke: 225 (1958b); Moldenke: 388 (1959); Moldenke: 727 (1971a); Coates Palgrave: 812 (1977). *V. wilmsii* Gürke var. *reflexa* (H.Pearson) W.Piep.: 74 (1928); Moldenke: 225 (1958b); Moldenke: 122 (1949); Moldenke: 154 & 388 (1959); Moldenke: 258 & 727 (1971a); Palmer & Pitman: 1961 (1973); Coates Palgrave: 812 (1977). Type: Transvaal [Mpumalanga], in

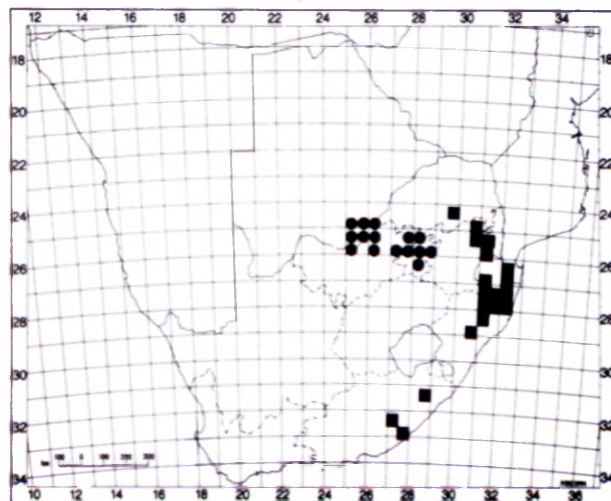


FIGURE 6.—Distribution of *Vitex zeyheri*, ●, *V. obovata* subsp. *obovata*, ■, in southern Africa.



FIGURE 7.—*Vitex obovata* subsp. *wilmsii*: A, habit, reduced, height variable,  $\pm \times 0.01$ ; B, flowering branch,  $\times 0.5$ ; C, variation in leaf shape,  $\times 0.33$ ; D, fruiting inflorescence,  $\times 2$ ; E, side view of flower,  $\times 4$ ; F, flower face showing corolla lobes,  $\times 3$ . Drawn from Bredenkamp 291, 293 and 295 (PRE). Artist: Gillian Condy.

dongas around Barberton, *Galpin 602* (BOL, holo.!, GRA!, PRE!, SAM!, SRGH!, Z!).

Trees (2.5–)3.0–4.0(–9.0) m high; single stemmed, diameter (120–)220–250(–300) mm; cork dark grey-brown, fissured, rough, tessellate; young stems and growing points glabrous or sparsely white-pubescent. *Leaves* palmately compound with 3–5 pinnae; petiole (14–)23–38(–49) mm long, glabrous or sparsely white-pubescent; petiolule (0–)4–7(–12) mm long, sparsely pubescent; median pinna (31.5–)51–74(–99) × (17–)21–29(–48) mm, elliptic, narrowly ovate or narrowly obovate, yellow-green to khaki or dark green, base acute, apex acute, shortly acuminate or rounded, margin entire or toothed in the upper half, adaxial surface glabrous, occasionally sparsely pubescent and glandular, abaxial surface pubescent and glandular, chartaceous. *Inflorescence* a compound dichasium, total length (33–)56–83(–120) mm, white-pubescent; length of bracts at first branch of inflorescence (4–)9–13(–19) mm. Description of flowers and fruit as for subgenus.

Two subspecies are distinguished:

- 1a Adaxial leaf surface appearing glabrous due to the lack of linear trichomes; median pinna (17–)21–29(–48) mm broad ..... 9a. subsp. *obovata*  
 1b Adaxial leaf surface pubescent due to the presence of linear trichomes; median pinna (22–)37–38(–70) mm broad ..... 9b. subsp. *wilmsii*

#### 9a. subsp. *obovata*

Distinguished from subsp. *wilmsii* by the characters given in the key above.

*Distribution and habitat:* Northern Province, Mpumalanga, particularly in the vicinity of Barberton, NE KwaZulu-Natal, Swaziland and Eastern Cape as far south as Komga and the Kei River, the southernmost record of the genus in Africa (Figure 6). The habitat is variable as illustrated by the following records: forms part of the undergrowth in riverine bush; in grassland against slopes of hills (Krantzkop, KwaZulu-Natal); in a very dry and stony habitat on shale (Komga); next to the road on stony red loam (Itala Nature Reserve); between forest trees (Ubombo Mountain Pass); in mixed *Combretum apiculatum*-veld (Jozini); in savanna (Mbabane); in dense savanna against steep, rocky north facing slopes (White River); on lime stone (Strydpoort). *Flowering time:* end of November to January. Fruits ripen in April. *Common names:* makosikate (*Miller S254*, PRE). Ama-kosikate, manohani, mokoele and pypsteel (Moldenke 1958b); Cape vitex, white vitex, Kei finger-leaf (English); Keivingerblaar (Afrikaans). *Utilisation:* wood is seldom used due to the availability of stronger wood types.

*Vouchers:* *Bredenkamp 208, 261* (topotype) (PRE, PUC); *Brown & Shapiro 347* (PRE); *Codd 4734* (PRE, SRGH); *Flanagan 578* (PRE); *Gerstner 3706* (NH); *Miller S254* (PRE).

9b. subsp. *wilmsii* (*Gürke*) C.L. *Bredenkamp* & D.J. *Botha* in *South African Journal of Botany* 59: 619 (1993). Types: Transvaal [Mpumalanga]: Bei Lydenburg, Desember 1895, fruchtend, *Wilms 158* (Z, lecto.!, fide *Bredenkamp* & *Botha* (1993); BM!, G!, K!, P!).

*V. wilmsii* *Gürke* var. *wilmsii*, *Gürke*: 76 (1900); H.Pearson: 216 (1901); W.Pieper: 74 (1928); *Worsd.*: 501 (1941); *Moldenke*: 122 (1949); *Moldenke*: 224 (1958b); *Moldenke*: 54 (1959); *Moldenke*: 258 (1971b); *Palmer & Pitman*: 1961 (1973); *Coates Palgrave*: 812 (1977).

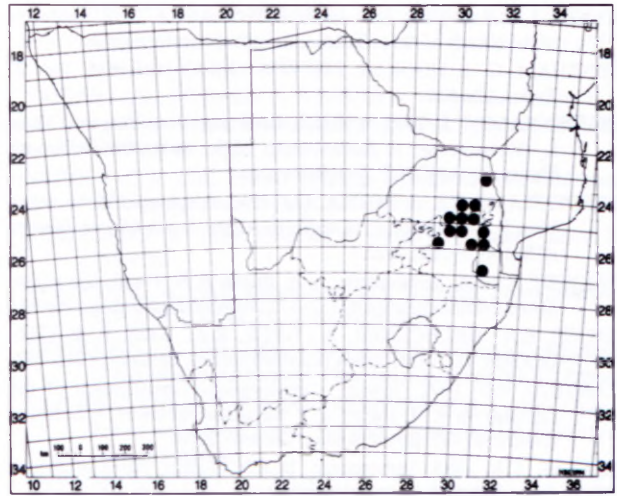


FIGURE 8.—Distribution of *Vitex obovata* subsp. *wilmsii* in southern Africa.

*Vouchers:* *Bredenkamp 251, 294* (PRE, PUC); *Burt Davy 7289* (BM); *Codd 6756* (PRE, SRGH); *Meeuse 9325* (PRE, SRGH); *Thorncroft 13* (PRE).

Trees (2–)3–4(–9) m high; young stems and growing points white-tomentose. *Leaves* palmately compound with 3–5 pinnae; petiole (16–)30–35(–72) mm long, white-pubescent; petiolule (0–)3–4(–13) mm long, white-pubescent; median pinna (43–)73–76(–137) × (22–)35–40(–70) mm, elliptic or narrowly obovate, dark green, base acute, apex acute, rounded or mucronate, ad- and abaxial surfaces white-pubescent and glandular. *Inflorescence* a compound dichasium, total length (47–)84–89(–113) mm, white-pubescent; length of bracts at first branch of inflorescence (4–)10–11(–17) mm. Description of flowers and fruit as for subgenus. Figure 7.

*Distribution and habitat:* endemic to SE parts of the Northern Province, N parts of Gauteng, Mpumalanga and Swaziland (Figure 8). The habitat of this plant varies, as is illustrated by the following records: against north and south facing slopes on dry stony dolomitic soils (Kaspersnek); against east facing slopes on stony soil in grassland (Karinio); in riverine bush in the Crocodile River valley (Nelspruit); on steep west facing slopes in forest (Louw's Creek). *Flowering time:* December to January. Fruits ripen in April. *Common names:* Wilms's vitex, umluthu (Z); ama-khosikate (Sw) (*Palmer & Pitman 1972*); hairy fingerleaf, hairy vitex (English); harige vingerblaar (Afrikaans).

*Vouchers:* *Bredenkamp 251, 294* (PRE, PUC); *Burt Davy 7289* (BM); *Codd 6756* (PRE, SRGH); *Meeuse 9325* (PRE, SRGH); *Thorncroft 13* (PRE).

#### EXCLUDED SPECIES

*Vitex guerkeana* H.Pearson non Hiem. is a synonym of *V. pearsonii* W.Pieper. (*Pieper 1928*), a tropical African species.

*Vitex mooiensis* H.Pearson is a synonym of *Premna mooiensis* (H.Pearson) W.Pieper. (*Moldenke 1971b*).

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