

Revision of the genus *Dombeya* (Sterculiaceae) in southern Africa

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Keywords: descriptions, *Dombeya*, key, revision, southern Africa

ABSTRACT

The species of *Dombeya* Cav. occurring in southern Africa are revised and a key is provided to the eight species present in the region. A new record for southern Africa, *D. quinqueseta* (Del.) Exell, is included.

INTRODUCTION

This revision is a contribution towards a treatment of the family Sterculiaceae for the *Flora of southern Africa*. The format followed is that previously used in the *FSA*, which differs in several respects from the current one and from that generally employed in *Bothalia*. Instead of recasting the work and so delaying publication of a much-needed revision of a well known genus of trees, it was decided to present the account in its original form.

Dombeya Cav., Diss. Bot. 2, App. 2 (1786); op. cit. 3: 121 (1787), nom. cons.; Harv. in FC 1: 220 (1860); Benth. & Hook. f., Gen. Pl. 1: 221 (1862); Arènes in Fl. Madag. 131, Sterculiaceae: 189 (1959); Wild in FZ 1: 518 (1961); M. Friedrich-Holzhammer et al. in FSWA 84: 2 (1969); Dyer in Gen. 1: 364 (1975). Lectotype species: *D. palmata* Cav.

Assonia Cav., Diss. Bot. 2, App. 2 (1786).

Xeropetalum Delile, Cent. Pl. Call. 4: 377 (1826).

Trees or, more often, lax to bushy shrubs, sometimes straggling; bark usually stringy; indumentum mainly of stellate or tufted, uni- or multicellular hairs, often lepidote and with simple, thick-walled or glandular hairs as well. *Leaves* simple, petioled, stipulate, usually palmately nerved (in African

species). *Bracts* 3, caducous, pubescent on both surfaces, close to the calyx or scattered, usually free. *Calyx* 5-lobed, pubescent on outside, tube short, usually with 5 patches of papillae just below the base of the lobes within; lobes reflexed in mature flowers. *Petals* 5, in African species usually obliquely obovate, cuneate (butterfly-wing-shaped), white or in varying shades of rose, sometimes flecked or veined with purplish red or deep rose at the base, persistent, turning cinnamon-rufous with age. *Stamens* 10-40, usually 15, united at the base into a short tube; filaments of different lengths in groups of 3-8 (occasionally 2 or 4), alternating with 5 narrowly linear-spathulate staminodes; anthers oblong, the cells parallel, opening by slits. *Ovary* 3-5-celled, sutures often partly bristly pubescent inside; style 3-5-branched; ovules 2-8 in a cell. *Capsule* subglobose, loculicidally dehiscent. *Seeds* globose to obovate-oblong, triquetrous; testa hard, rough with minute ridges, dots or pits.

Native of Africa, Madagascar and the Mascarene Islands. In South Africa eight species and one variety are recognized.

For the conservation of the name and for the type species see the *International Code of Botanical Nomenclature* 1983, p.380. The genus was named in honour of J. Dombey, a French botanist who travelled in Chile and Peru in the late eighteenth century.

KEY TO SPECIES

- 1a Petals over 1 cm long; ovary usually 5-celled; style branches usually 5:
 - 2a Pubescence on branchlets, petioles and peduncles usually distinctly stellate-pubescent, sometimes hairs spreading but then mostly under 1 mm long, not glandular; leaves 3-10 cm long, 2-3 cm broad 1. *D. tiliacea*
 - 2b Pubescence on branchlets, petioles and peduncles of long, spreading hairs, glandular and/or non-glandular and acute, mostly over 1 mm long; leaves large, 6-23 cm long, 5-19 cm broad:
 - 3a Leaves distinctly discolourous, lower surface metallic-grey with a short dense indumentum of fine hairs giving it a felted appearance; pubescence often of predominantly glandular, light brown, spreading hairs..... 2. *D. pulchra*
 - 3b Leaves not obviously discolourous or if somewhat so the indumentum on the lower surface sparsely stellate to densely stellate-tomentose; pubescence usually mainly of non-glandular, acute, spreading hairs..... 3. *D. burgessiae*
- 1b Petals under or up to 1 cm long; ovary usually 3-celled; style branches usually 3:
 - 4a Leaves ovate to broadly ovate, gradually narrowing in the upper third or obscurely 3-lobed, the central lobe the largest; lobes obtuse or the central one acuminate:
 - 5a Leaves rather thin in texture, acuminate at the apex, reticulate veins on the lower surface not very conspicuous and prominently raised:

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- 6a Leaves mostly under 7×6 cm; pubescence on the peduncles stellate with short (± 1 mm) hairs 4. *D. cymosa*
- 6b Leaves variable in size up to $11 \times 10,5$ cm; pubescence on pedicels and peduncles mostly stellate-tomentose intermixed with long (up to 1,5 mm), thin, acute spreading hairs 5. *D. kirkii*
- 5b Leaves thick in texture, the upper third not acuminate into a narrow apical portion, leaves sometimes appearing shallowly 3-lobed, lobes rounded, reticulate veins on lower surface conspicuous and prominently raised 6. *D. quinqueseta*
- 4b Leaves suborbicular to broadly ovate, broadly rounded at the apex, sometimes acute but never acuminate in the upper third:
- 7a Trees or shrubs with very rough bark; in shrubby form rough bark only on the lower portion of the plant; usually flowering in early spring on more or less leafless branches except on the central plateau of South West Africa/Namibia where they flower at any time from spring to autumn depending on rains:
- 8a Ovary tomentellous with stellately pubescent scales as well as setose with tufted bristle-like suberect hairs 7a. *D. rotundifolia* var. *rotundifolia*
- 8b Ovary tomentose with dense, stellately pubescent scales, the hairs short, not setose; tall shrubs with a few long virgate stems; leaves velvety stellate-tomentose; restricted to the Naukluft area of South West Africa/Namibia, near permanent water 7b. *D. rotundifolia* var. *velutina*
- 7b Shrubs with several to many slender stems, rarely a small tree; bark never rough; usually flowering in autumn; ovary stellate-tomentose with short hairs (not setose as well); restricted to mesophytic areas in the mountainous north-eastern Transvaal 8. *D. autumnalis*

1. *Dombeya tiliacea* (Endl.) Planch. in Fl. des Serres, sér. 1, 6: 225 (1850–51). Type: Cape, Drège s.n. (P!).

Xeropetalum tiliaceum Endl. & Fenzl, Nov. Stirp. Decad. 43 (1839). *Leeuwenhoekia tiliacea* E. Mey. ms. *Dombeya dregeana* Sond. in Linnaea 23: 18 (1850); Harv., Thes. Cap. 1: 56, t. 89 (1859); FC 1: 221 (1860); K. Schum. in Engl., Monogr. Afr. Pfl. 5: 30 (1900); Sim, For. Fl. Cape Col. 45 (1907).

D. natalensis Sond. in Linnaea 23: 17 (1850); Harv. in FC 1: 221 (1860); Wood, Natal Pl. 73, pl. 90 (1899); K. Schum. in Engl., Monogr. Afr. Pfl. 5: 29 (1900); Sim, For. Fl. Cape Col. 146 (1907). Type: Port Natal, Gueinzus 105 (SAM, iso.).

D. gracilis K. Schum. in Engl., Monogr. Afr. Pfl. 5: 30 (1900). Type: Natal, Umvoti, MacOwan & Bolus in Herb. Norm. 562 (BOL).

D. elegans K. Schum. in Engl., Monogr. Afr. Pfl. 5: 31 (1900), nom. illegit., pro parte as to *Flanagan 1409* (STE), non Cordem. (1895).

Shrub, sometimes straggling, 2–3 m high or tree up to 10 m tall. *Branchlets* slender, longitudinally ridged, with prominent leaf-scars and with small, pale, raised lenticels, glabrescent but new growth laxly to densely stellate-pubescent with patent or appressed hairs rarely up to 1 mm long. *Stipules* early caducous, linear-subulate from a rather broad base, (rarely deltoid to narrowly deltoid-long-acuminate), sparsely to densely stellate-pubescent, glabrescent, sometimes subpetaloid. *Leaves* often thin in texture, ovate, gradually acuminate, sometimes 3-lobed at the apex, the 2 lateral lobes shallow, 3–10 cm long, 2–8 cm broad, shallowly to deeply cordate, rarely rounded or subtruncate at the base, margins crenate to crenate-dentate, the lateral veins running to the point of the tooth but not clearly excurrent, nerves from the base 3–7 but usually 5, upper and lower surfaces thinly to densely stellate-pubescent, often glabrescent, hairs sometimes longer and some simple on the lower surface; petiole 2–6,5 cm long, usually subspreading, stellate-pubescent and with simple spreading hairs, usually under 1 mm long, glabrescent. *Inflorescence* cymose to subumbellate, usually appearing in late summer or autumn in the axils of the upper leaves, 2–9-flowered; peduncle usually straight, 1,5–8 cm long, stellate-pubescent and sometimes with simple hairs as well, hairs usually

under 1 mm long; pedicels 1,5–3 cm long, pubescent like the peduncle. *Buds* ovate or spindle-shaped. *Bracts* 3, free, early caducous, variable in size and shape from broadly ovate to narrowly linear, 5,5–10 mm long, 1–4 mm broad, gradually and shortly acuminate at the apex or abruptly acuminate into a caudate apical third, margins sometimes with an odd lobe or two, shortly stellate-pubescent on both surfaces, the broad bracts usually close to the rounded base of the calyx and the narrower ones at the base of the stipe. *Calyx* lobed almost to the base, united portion 2,5 mm long, rounded at the base or with a short or long stipe, up to 4 mm long; lobes usually reflexed, narrowly oblong-acuminate, about 9–15 mm long, 2,5–4 mm broad, pubescent dorsally. *Petals* persistent, white (rarely pink) turning rust-coloured with age, oblique, cuneate, about 12–17 mm long, 11–16 mm broad at the apex. *Stamens* united at the base into a tube 2–4,5 mm long; filaments of different lengths, the longest about 4 mm long; anthers 2–3,5 mm long; staminodes about 11 mm long. *Ovary* tomentose and with a few projecting hairs in the apical portion, but these hairs usually under 1 mm long, 5-celled but sometimes imperfectly so; ovules 2–4 per cell; style 8–10 mm long, 3–5-branched at the apex, glabrous or stellate-pubescent in lower half. *Capsule* about 7 mm long, stellate-tomentose, hairy on the sutures within; seed 3-sided and broadly rounded at the top, about 5×7 mm, rough, with minute ridges and dots.

Found in bush, mixed scrub, coastal short forest or subtropical scrub forest. Recorded from the eastern Cape and Natal.

CAPE.—Albany: 'Kleinemund', MacOwan 568 (BOL). Bathurst: Port Alfred, Galpin 5; Britten 1427. Butterworth: Acocks 12539. East London: Comins 1512; Rogers 17017; Smith 3745. Kentani: Pegler 359. Komga: Flanagan 56. Peddie: Acocks 12779.

NATAL.—Without precise locality, Cooper 1105. Durban: Medley Wood 10973; 'Port Natal', Ecklon & Zeyher s.n. (SAM); Gueinzus s.n. (SAM). Estcourt: Entumeni, Medley Wood 3745 (NH); Hlatikulu Forest, Killick 1956. Hlabisa: St Lucia, Ward 3127. Ixopo: Taylor 2098. Kranskop: Jameson's Drift, Dyer 4370. Lions River: Howick, Schlechter 6793. Lower Tugela: near Umvoti River, Adlam in Herb. Norm. 562. Nkandhla: Nsuzi Valley, Codd 9681. Pietermaritzburg: Table Mountain, Killick 106. Port Shepstone: McClean 474. Umzinto: Rudatis 1370.

In the *Flora Capensis* the specimens here included in one species were separated into two species on the width of the epicalyx bracts and the shape of the buds. Those with broad bracts were named *D. dregeana* and were supposed to occur in the Cape Province, whereas those with narrow bracts and 'more fusiform buds' were named *D. natalensis*. However, the bracts vary in width, and several intermediates between the two extremes can be found. Although the epicalyx bracts are early deciduous, a study of many herbarium specimens has shown that the broader bracts are usually borne just below the rounded base of the calyx whereas the narrower bracts are borne slightly lower. Bract-scars can give a clue as to whether the bracts were broad or not. It appeared that some specimens with broad, and some with narrow bracts, occurred both in the Cape and Natal. The impression was gained that the broad bracts usually occur on specimens growing in bush in dry country and the narrow ones on trees in forests and that these characters are therefore not specific but rather indicate ecotypes.

Originally Drège gave the manuscript name *Leeuwenhoekia tiliacea* to both his Cape and Natal specimens, showing that he considered them to be one species. In the *Flora Capensis*, Drège's Cape material is put under *D. dregeana* and the Natal specimens under *D. natalensis*.

2. *Dombeya pulchra* N.E. Br. in Kew Bull. 97: 142 (1895); Burt Davy, Fl. Transv. 1: 259 (1926). Type: Barberton, Galpin 804 (K, holo.; PRE, iso.; SAM; BOL).

Shrub, 1–4 m high, sometimes a fairly large tree up to 7 m tall. Branches longitudinally ridged, not very stout, fairly smooth; bark stringy; pith soft; branches laxly to very densely pubescent with light brown, more or less patently spreading, glandular hairs over 1 mm long. Very occasionally a specimen has a few acute, non-glandular hairs intermixed, or rarely, pubescence entirely of non-glandular, acute, patent hairs. Stipules subovate-oblong or linear-acuminate, about 10–16 mm long, 2–6 mm broad, felted on both sides with a short velvety pubescence sometimes with a few long or glandular hairs along the margins. Leaves with blade broadly ovate, about 6,5 × 6 to 25 × 9,5 cm, deeply cordate at the base, broadly acuminate, sometimes 3-, rarely 5-lobed in the upper half, obscurely to shallowly crenate-dentate on the margins, distinctly discolourous, upper surface with a lax to dense, short, stellate pubescence, lower surface always metallic-grey, felted with a short velvety pubescence, 5–7-palmately nerved, veins slender, prominent on lower surface; petiole 3–16 cm long, sparsely to densely pubescent with light brown, patent, glandular hairs, rarely with pointed non-glandular hairs mixed, or dominant (specimen of hybrid origin?), usually thicker than the peduncle, longer or shorter than the peduncle. Inflorescence cymose, axillary in upper leaves, 2–17-flowered; peduncle 4–14 cm long, sparsely to densely glandular hairy; pedicels up to 2,5 cm long, similarly hairy. Bracts inserted at or very near the calyx base, ovate, narrowly ovate-oblique, oblong or narrowly oblong, 5–16 mm long, 2–8 mm broad,

shortly acuminate to a subacute or caudate apex, cordate, rounded or somewhat cuneate at the base, tomentose with stellate or tufted hairs, often shortly and densely so, giving a felted appearance, sometimes hairs longer and shaggy. Calyx rounded at the base or with a short stipe up to 2 mm long, rarely longer; lobes 8–18 mm long, gradually acuminate from the 1,5–5 mm broad base, stellate-tomentose dorsally, sometimes hairs short and dense giving a felted appearance. Petals mostly white, sometimes creamy or pink and some flowers with purplish-rose markings at the base of the petals, persistent, turning light cinnamon-rufous with age, about 12–20 mm long, 11–20 mm broad near the apex. Stamens united at the base for about 3 mm, filaments of different lengths, up to about 4 mm; anthers about 3,5 mm long; staminodes about 10 mm long. Ovary about 3 mm long, 2,5 mm broad; velvety tomentose with a few slightly longer tufted hairs showing; style about 8 mm long, pubescent at the base, branches 5, strongly recurved, about 3,5 mm long; cells 5, walls thin, with up to 6 ovules in each cell. Capsule 7–10 mm long, about 7 mm broad, with a short dense stellate tomentum intermixed with longer tufted hairs (but these hairs under 1 mm long), pubescent on the sutures within; seeds brown, pitted.

Found in the cooler regions with a fairly high rainfall, on rocky hills, in tall grass with scattered shrubs, on the edge of kloofbush or in damp places on banks of streams. Recorded from Swaziland and the eastern Transvaal mountainous country.

SWAZILAND.—Mbabane: near Dalriack, Bolus 11716 (BOL); Valley, Compton 25024. Pigg's Peak: Komati Bridge, Compton 30050.

TRANSVAAL.—Barberton: Rimer's Creek, Galpin 804; Louws Spruit, Bolus 7681 (BOL); Highlands Creek, Clarke 55. Belfast: Waterval Boven, Rogers sub TRV 14772. Carolina: Waterval Onder, Rogers sub TRV 2351. Lydenburg: Wilms 78; Uitsoek, Codd & Verdoorn 10507. Nelspruit: Numbi, Van der Schijff 3052. Pilgrims Rest: Marieps Kop, Van der Schijff 4581.

This species closely resembles *D. burgessiae* and the areas of distribution of the two species overlap in part, but *D. pulchra* is restricted to the cooler regions with higher rainfall in the eastern Transvaal and Swaziland. *D. burgessiae* is widespread, from the Natal coast through Swaziland and the eastern Transvaal to the tropics. A few intermediate or hybrid specimens were seen from localities in which the areas of distribution overlap.

3. *Dombeya burgessiae* Gerrard ex Harv. in FC 2: 590 (1862); Harv., Thes. Cap. 2: 24, t. 137 (1863); Hook. f. in Bot. Mag. 21: t. 5487 (1865); Mast. in FTA 1: 228 (1868); K. Schum. in Engl., Monogr. Afr. Pfl. 5: 28 (1900); Sim, For. Fl. P.E.A. 20, pl. 8 (1909); Burt Davy, Fl. Transv. 1: 260 (1926); Wild in FZ 1: 522 (1961). Syntypes: Natal, Zululand, McKen s.n. (not seen); Klip River, Gerrard s.n. (TCD).

Asonia burgessiae (Gerrard ex Harv.) Kuntze, Rev. Gen. 1: 76 (1891).

Dombeya burgessiae var. *crenulata* Szyszyl., Polypet. Thalam. Rehm. 137 (1887). Syntypes: Natal, Newcastle, Rehmann 7034, 7049 (not seen); Drakensberg, Rehmann 7078 (not seen). *D. elegans* K. Schum. in Engl., Monogr. Afr. Pfl. 5: 31 (1900); Burt Davy, Fl. Transv. 1: 260 (1926), nom. illegit., pro parte as to Nelson 531 (PRE), non Cordem. (1895).

D. rosea Bak.f. in J. Linn. Soc. (Bot.) 40: 29 (1911). Type: Rhodesia [Zimbabwe], Swynnerton 196 (BM, holo.; K; SRGH).

Shrub, 1–4 m high with several to many stems, sometimes a slender tree. *Branches* stout, longitudinally ridged with fairly prominent leaf scars and many lenticels, more or less pubescent; ultimate branchlets comparatively slender, patently pubescent with a mixture of long, pointed, multicellular, thin-walled hairs and obtuse, glandular, multicellular hairs, hairs mostly over 1 mm long, single or two to several from the same base. *Stipules* variable, broadly ovate-acuminate from a broad subcordate base, narrowly oblong-acuminate, or narrowly lanceolate-acuminate, 1–1.7 cm long, 3–8 mm broad, densely to sparsely pubescent, glabrescent, from rather thick-textured and dark brown to fairly thin-textured and light brown. *Leaves* broadly ovate, 6–20 cm long, 5–19 cm broad, deeply cordate at the base, usually 3–5-lobed, sparsely to very densely pubescent with stellate and tufted hairs, lower surface usually more densely so than the upper, 5–7-palmately nerved, margins irregularly and unequally crenate to crenate-dentate; petiole 2–15 cm long, mostly thicker than the peduncles, \pm 1.5–2 mm long, usually sparsely to densely patently pilose at least in part, with multicellular, non-glandular, pointed hairs mixed to a greater or lesser degree with glandular hairs. *Inflorescence* cymose, axillary, 2- to several-flowered; peduncle longer or shorter than the subtending petiole and usually slightly more slender, 2–14 cm long, similarly pubescent, branched in the upper half; pedicels up to 3 cm long. *Bracts* 3, free to the base, early caducous, variable in size, shape and pubescence, narrowly or broadly oblong to ovate-subcordate, shortly acuminate to an acute or shortly caudate apex, 9–15 mm long, 3–8 mm broad, pubescent on both surfaces, shortly tomentose or less densely covered with stellate and long tufted hairs, inserted close to the calyx base or up to 1.5 mm distant. *Calyx* lobed almost to the base, the united portion (about 1.5 mm long) consolidated with the ovary base which is rounded or with a short stipe; lobes about 14 mm long, acuminate from a 3–4 mm wide base, dorsally pubescent. *Petals* white or pale pink, sometimes with a rose-pink centre, persistent, turning light brown with age, up to 20 mm long, 18 mm broad at the apex. *Stamens* united at the base for 2–4 mm, filaments of various lengths, up to 4.5 mm long; anthers 3–4 mm long; staminodes 10–13 cm long, 2 mm broad in upper half. *Ovary* about 6×6 mm, stellate-tomentose to hirsute with tufted hairs, normally 5-celled; style 8–14 mm long, glabrous or partly to wholly stellate-tomentose, 3–5-branched; ovules 3–4 in a cell. *Capsule* about 10 mm long, 8 mm broad, stellate-tomentose to hirsute with tufted hairs (hairs about 1 mm or more long), pubescent on the sutures within.

Found at forest margins, edge of bush, on wooded stream banks, in kloofs, on grassy slopes with tall grass and in marshy ground, or on rocky dolerite hillsides under trees. Recorded from Natal, Swaziland and the eastern and northern Transvaal; also found in tropical Africa from Mozambique and Zimbabwe to Kenya.

NATAL.—Durban: Berea, Medley Wood 11094. Estcourt: Tabamhlope, West 1086. Hlabisa: Codd 9612; Hluhluwe Game Re-

serve, Ward 2202. Ingwavuma: Codd & Dyer 2838. Klipriver: Gerrard 465 (NH); Grobbelaars Kloof, Acocks 1002. Mtonjaneni: Melmoth, Lawn 1949 (NH). Newcastle: Rehmann 7034 (BOL). Nongoma: Gerstner 3910. Richmond: Waterfall, Thode A. 1203.

SWAZILAND.—Hlatikulu, Stewart sub TRV 10089.

TRANSVAAL.—Barberton: near Kobinja, Codd 7806. Letaba: 'Houtbosch', Rehmann 6321 (BOL); Duiwelskloof, Scheepers 262; Galpin 11385; Modjadjies, Krige 105; Dublin Mine, Miller 4262. Lydenburg: Erasmus Pass, Strey 3721. Messina: Pole Evans 1447. Pietersburg: Blaauwberg, Codd 7956. Piet Retief: Mooihoek, Devenish 1022. Sibasa: Tshakhoma, Van Warmelo 5157/19; Punda Milia, Van der Schijff 973. Soutpansberg: Wylliespoort, Hutchinson 2059; near Louis Trichardt, Meeuse 10209.

For the relationship with *D. pulchra* see the notes under that species.

In the Natal Herbarium there is a specimen, West 1976 from Mapumulo, Tugela, which seems to be a hybrid between this species and *D. tiliacea*; in cultivation one finds plants which resemble *D. burgessiae* but do not agree exactly with it or with any other South African species. They are probably cultivars of *D. burgessiae*. Nurserymen sometimes use the names *D. rosea* and *D. calantha* for pink-flowered cultivated Dombeyas. Specimens seen to date in gardens are not at all like those species. *D. rosea* Bak.f., from Zimbabwe, is a synonym of *D. burgessiae*, whereas *D. calantha* K. Schum., from Malawi, is described as having very large, coarsely crenate leaves and the flowers borne on long brown-tomentose pedicels.

4. *Dombeya cymosa* Harv. in FC 2: 589 (1862); K. Schum. in Engl., Monogr. Afr. Pfl. 5:33 (1900); Sim, For. Fl. Cape Col. 145, pl. 18, Fig. 4 (1907); Wild in FZ 1: 527 (1961). Type: Eastern Cape, Kaffraria, Bowker 216 (TCD, holo.; PRE, fragment).

Small tree or shrub, about 3 m tall, sometimes up to 8 m tall, occasionally a straggling bush about 1.3 m tall. *Branchlets* slender, woody, glabrous, or new growth with short, massed, stellate hairs, faintly longitudinally ridged, leaf-scars fairly prominent, lenticels small, raised, more or less circular. *Stipules* early deciduous, linear-subulate, 2–7 mm long, densely stellate-pubescent to glabrescent, thick to subpetaloid in texture. *Leaves* rather thin in texture, ovate, gradually narrowing in the upper third and then abruptly acuminate towards the apex, rounded or shallowly cordate at the base, not very large, usually under 70 mm long and 60 mm broad, crenate on the margin, sparsely and coarsely stellate-pubescent on both surfaces, glabrescent; hairs short; petioles on flowering branches up to 35 mm, sparsely to densely stellate-pubescent. *Inflorescence* cymose-corymbose to subumbellate, 3–12-flowered, axillary in the upper leaves of the main branches and the many short lateral branchlets; peduncles slender, 1–3 cm long, coarsely stellate-tomentose; pedicels varying from 2 to 7 mm long, coarsely stellate-tomentose with hairs short and appressed. *Bracts* 3, scattered on the pedicels, often distant from the calyx and from each other or 2 about midway, subopposite, early caducous, linear-subulate, densely stellate-pubescent, 1–2 mm long. *Calyx* lobed almost to the subrounded base, united for about 1 mm, stellate-pubescent without, sometimes glabrescent; lobes 4–5 mm long, 1.5–2 mm broad, usually reflexed in mature flowers. *Petals* white, turning rusty brown

with age, persistent, 6–8 mm long, 4–5 mm broad near the apex. *Stamens* united at the base for less than 1 mm, free portion varying slightly in length, the longest about 4 mm long; anthers 0,75 mm long; staminodes up to 5 mm long. *Ovary* appressedly stellate-tomentose, suboblate, about 1,5 mm long, 2 mm diam., 3- or rarely 4-celled; style about 1,5 mm long, branches 3, sometimes 4, about 3 mm long, rather thick and revolute; ovules usually 2 in a cell, smooth, hard, yellow. *Capsule* 4 mm long, 3,5 mm in diameter, stellate-tomentose with short hairs (under 1 mm long); seeds usually only one developing and filling the capsule, rough with raised lines.

Found on river and stream banks, forest margins, short closed woodland, stony slopes in gorges or dry valley bushveld scrub. Recorded from the eastern Cape, Natal, Swaziland and the eastern Transvaal; also found in Mozambique and Malawi.

CAPE.—Butterworth: *Pegler* 770. East London: *Pearson* 7363; *Rattray* 274 (GRA). Elliotdale: 'Krelis Country', *Bowker* 216. Komga: *Flanagan* 58; Kei Cutting, *Barker* 9253 (NBG). Queens-town: Junction Farm, *Galpin* 8077. Stutterheim: Kei Valley, *Acocks* 9684. Tsolo: Tsitsa Waterfall, *Galpin* 6587 (GRA; BOL).

NATAL.—Dundee: *Codd* 2414. Durban: *Medley Wood* 6438. Hlabisa: False Bay, *Ward* 3670; Hluhluwe Game Reserve, *Ward* 2291. Ixopo: *Huntley* 356. Kranskop: Mambula, *Dyer* 4348. Port Shepstone: Oribi Flats, *McClean* 398. Ubombo: *Strey* 5286. Umvoti: *Edwards* 2757. Weenen: *Acocks* 10144.

SWAZILAND.—Stegi, *Ben Dlamini in Herb. Compton s.n.*

TRANSVAAL.—Nelspruit: Malelane, *Codd* 5258. Pilgrims Rest: Mariepskop, *Van der Schijff* 5502.

In some keys to this genus the distinguishing character between this species and *D. kirkii* is given as 'stamens 2 per fascicle' as opposed to 'stamens 3 per fascicle'. In the South African specimens most of the flowers dissected had 2, 3 and sometimes 4 stamens in a fascicle.

It is reported that honey produced by bees visiting these plants is excellent.

5. *Dombeya kirkii* Mast. in FTA 1: 227 (1868); K. Schum. in Engl., Monogr. Afr. Pfl. 5: 39 (1900); Sim, For. Fl. P.E.A. 20 (1909); Wild in FZ 1: 527 (1961). Syntypes: 'Nyassaland', *Meller s.n.* (K); Mozambique, Lupata Gorge, *Kirk s.n.* (K).

D. gilgiana K. Schum. in Engl., Pflanzenw. Ost.-Afr. C.270, t. 30 (1895). Syntypes: 'Tanganyika', Mschusas Dorf, *Holst* 8993; 9171a (K).

Shrub 1–5 m tall (in the tropics sometimes a tree up to 10 m tall). *Branchlets* woody, faintly longitudinally ribbed with scattered lenticels and prominent leaf-scars; young branches densely stellate-pubescent. *Stipules* 4–8 mm long, narrowly linear, thick or thin in texture, sometimes with incurved margins, stellate-pubescent with interspersed glandular hairs. *Leaves* ovate, gradually narrowing in the upper third, the apex abruptly acuminate, 4–12 cm long, 3–11 cm broad, crenate on the margins, cordate at the base, 5–9-nerved from the base (nerves tomentose) stellate-pubescent on both surfaces, hairs short and appressed, wearing off with age; petiole 1–6 cm long, stellate-tomentose. *Inflorescence* a cymose panicle, short or elongated, axillary and clustered at the apices of the branchlets, usually appearing from February to May, pubescent with the characteristic patent hairs; peduncle 1,5–8 cm long, stellate-to-

mentose interspersed with long, patent pointed hairs; pedicels usually 0,5–1,5 cm long, sparsely to densely patent pubescent as well as tomentose. *Bracts* 3 at the base of the calyx, linear to linear-elliptic (that is narrowing slightly to base and apex), sometimes conduplicate, shortly tomentose on both surfaces, the outer also bristling with long patent hairs, 5–7 mm long, 1–1,5 mm broad at the middle. *Calyx* rounded at the base, united for about 1,5 mm; lobes 5–7 mm long, 1,5–2 mm broad at the base, dorsally tomentose and usually patent hairy as well. *Petals* white turning light brown with age, persistent, 8–10 mm long, 4,5–5 mm broad just above the middle. *Stamens* united for 1–1,5 mm, 3 rarely 2 between the staminodes; filaments of different lengths, very slender, up to 4 mm long; anthers 1 mm long; staminodes very slender, 7 mm long. *Ovary* 3-celled, 2,5 mm long, 2,5 mm broad, tomentose and with long erect hairs at the apex, hairs up to 1 mm long; style about 2–3,3 mm long, sparsely hairy near base or sometimes altogether pubescent, branches suberect or slightly recurved, about 3 mm long; ovules usually 2 in a cell. *Capsule* 4×3 mm, with tufted setose hairs at the apex, hairs about 1 mm long.

Found on dry river banks in the north-eastern corner of the Transvaal; also recorded northwards as far as Kenya.

TRANSVAAL.—Sibasa: Pafuri, *Van der Schijff* 3045; 3810; *Van der Schijff & Marais* 3715.

The stems are said to be used by the Masai for making bows. Of the tropical African species that are considered to be synonymous by certain authors, only *D. gilgiana* is included here. This is because no material of the other synonyms has been seen, whereas the plate accompanying the original description of *D. gilgiana* clearly represents *D. kirkii*.

6. *Dombeya quinqueseta* (Del.) Exell in J. Bot., Lond. 73: 263 (1935). Type: *Cailliaud in Herb. Del.* (MPU; not seen).

Xeropetalum quinquesetum Del., Cent. Pl. Afr. 84 (1826).

Dombeya reticulata Mast. in FTA 1: 228 (1868). *Assonia reticulata* (Mast.) Kuntze, Rev. Gen. Pl. 1: 85 (1896). Type: Nile Land, *Spike & Grant s.n.* (K).

Assonia cuanzensis Hiern, Cat. Afr. Pl. Welw. 1: 86 (1896). *Dombeya cuanzensis* (Hiern) K. Schum. in Engl., Monogr. Afr. Pfl. 5: 40 (1900). Syntypes: Angola, Pungo Andongo, *Welwitsch* 4735; 4736 (BM!).

Assonia huillensis Hiern, Cat. Afr. Pl. Welw. 1: 85 (1896). *Dombeya huillensis* (Hiern) K. Schum. in Engl., Monogr. Afr. Pfl. 5: 35 (1900). Syntypes: Angola, Huilla, near Quipungo, *Welwitsch* 4726 (BM); near Lopollo, *Welwitsch* 4727 (BM); 4728 (BM).

D. myriantha K. Schum. in Engl., Monogr. Afr. Pfl. 5: 33, t.2, A (1900). Type: Angola, *Buchner* 527 (B†).

D. cuanzensis sensu K. Schum. in Warb., Kunene-Samb. Exped. Baum 301 (1903), non (Hiern) K. Schum.

D. melanostigma K. Schum. ex Engl. in Engl., Pflanzenw. Afr. 3,2: 428 (1921), nom. nud.

D. rotundifolia sensu Exell in J. Bot. 65, Suppl. Polypet. 42 (1927), pro parte quoad spec. *Gossweiler* 1747, non Harv.

Shrub or small tree up to about 5 m tall. *Branchlets* woody, brown to reddish brown, minutely stellate-pubescent when young, glabrescent, with a few scattered lenticels and prominent leaf-scars. *Stipules*

apparently early deciduous. *Leaves* ovate, sometimes shallowly 3-lobed, cordate to deeply cordate at base, up to 14 cm long and 20 cm broad, margin faintly dentate, 5–7-nerved from the base, upper surface stellate-pubescent, densely so on main and secondary veins, lower surface densely stellate-tomentose when young, pubescence less dense with age, reticulate veins on lower surface conspicuous and prominently raised; petiole up to 7,5 cm long, stellate-tomentose. *Inflorescence* of dense axillary cymes on old branches; peduncles up to 6 cm, densely stellate-tomentose; pedicels up to 10 mm long, densely stellate-tomentose. *Bracts* 3, at the base of the calyx, whorled or 1 at base of calyx and 2 lower down, subopposite, linear, 3 mm long, not more than 0,5 mm broad, densely stellate-tomentose on outside, glabrous inside. *Calyx* rounded at the base, united for 1–2 mm; lobes 5–7 mm long, 1–2 mm broad near base, dorsally densely stellate-tomentose. *Petals* white, turning yellow to light brown with age, shaped like the wings of a butterfly, up to 10 mm long and 6 mm broad. *Stamens* 15, united for 0,5 mm at the base; staminodes 5, linear, up to 8 mm long; fertile stamens in 5 groups of 3 each alternating with the staminodes; filaments of different lengths, up to 4 mm long; anthers 1 mm long. *Ovary* depressed globose, 3 mm in diameter, 2,5 mm long, tomentose with long erect hairs at the apex, 3-celled with 2 ovules in each cell; style 2–2,5 mm long; branches 2–2,5 mm long, recurved. *Fruit* not seen.

Found in the Okavango area of South West Africa/Namibia and northwards through Angola to Kenya, Uganda and Ethiopia.

S.W.A.—Grootfontein: *Barnard* 194.

7. *Dombeya rotundifolia* (Hochst.) Planch. in Fl. des Serres, sér. 1,6: 225 (1850–51). Type: Natal, Pietermaritzburg, *Krauss* 252 (BM, iso.).

Tree or shrub, 2–10 m tall; stems with rough bark. *Stipules* caducous, narrowing from a triangular base into a linear-subulate upper portion, stellate-pubescent. *Leaves* more or less orbicular, rarely very broadly ovate, 2–8 cm long, 1,8–9 cm broad (larger on sterile branches and in tropical areas up to 13×14 cm), sparsely to densely stellate-pubescent on both surfaces, the stellate hairs from a scaly base, crenate-dentate, shallowly to clearly cordate at the base; petiole 1–3 cm long, stellate-tomentose. *Cymes* several- to many-flowered, crowded at the apices of the branches and branchlets; peduncles 1–4 cm long, stellate-tomentose, sometimes with few to many longer, tufted hairs intermixed, pedicels 0,5–1,5 cm long, pubescence as on the peduncles. *Bracts* 3, 1 or 2 at or near the calyx-base and 1 lower down, or all three scattered on the pedicel, linear to linear-spatulate or navicular, 1,5–5 mm long, sparsely to densely stellate-pubescent on both surfaces. *Calyx* rounded at the base, united for 0,5–1,5 mm; lobes 5–7 mm long, 1,5–2 mm broad near base, stellate-pubescent dorsally. *Petals* usually white (rarely rose-pink) turning a light cinnamon-brown, 7–10 mm long, 4,5–8 mm broad. *Stamens* united at the base for up to 0,5 mm; filaments up to 3 mm long; anthers 1 mm long or slightly longer; staminodes about 6 mm long. *Ovary* subglobose, about 2,5 mm in diameter,

tomentellous with stellate hairs mixed in the upper half with tufted bristle-like hairs, bristles 0,5–1 mm long; style with a few short patent hairs or stellate-pubescent, 2,5–3,5 mm long; branches 1,5–2,5 mm long; cells usually 3 with 2 ovules in each cell. *Capsule* subglobose, about 5 mm in diameter, tomentellous with stellate and tufted hairs; the large bristle-like hairs up to 1 mm long.

Occurs plentifully in Natal, Swaziland, the Transvaal and South West Africa/Namibia; also found in Botswana and northwards to east tropical Africa. Two varieties are recognized, one widespread (var. *rotundifolia*) and the other from a restricted area in South West Africa/Namibia.

For key to varieties, see key to species.

(a) var. *rotundifolia*.

Verdoorn in *Bothalia* 9: 144 (1966).

Dombeya rotundifolia (Hochst.) Planch. in Fl. des Serres, sér. 1,6: 225 (1850–51); Harv. in FC 1: 221 (1860); K. Schum. in Engl., Monogr. Afr. Pfl. 5: 35 (1900); Medley Wood, Natal Pl. 3, t. 229 (1902); Sim, For. Fl. Cape Col. 145 (1907); Burt Davy, Fl. Transv. 1: 259 (1926); Wild in FZ 1: 525 (1960); M. Friedrich-Holzheimer et al. in FSWA 84: 2 (1969). *Xeropetalum rotundifolium* Hochst. in Flora 27: 295 (1844). Type: Natal, Pietermaritzburg, *Krauss* 252 (BM, iso.).

D. densiflora Planch. ex Harv. in FC 2: 589 (1862). Type: Transvaal, Magaliesberg, *Burke & Zeyher* s.n. (K).

D. damarana K. Schum. in Engl., Monogr. Afr. Pfl. 5:36 (1900). Syntypes: Hereroland, *Marloth* 1346; 1371 (PRE). *Lindley* s.n.; *Gürich* 40.

D. dinteri Schinz in Bull. Herb. Boiss., sér. 2, 2: 1005 (1902). Syntypes: Hereroland, Waterberg, *Dinter* 392 (Z); Ondjombekanga-Kette *Dinter* 392a (Z).

Characterized by very rough bark on stems; rather coarse suborbicular leaves which are densely or sparsely stellate-pubescent on both surfaces and have prominent reticulate veins beneath; the ovary is densely stellate-tomentose and setose, that is with tufts of bristle-like hairs which are up to 1 mm long, in upper portion.

This typical variety occurs in two growth forms. The commoner form is a tree 5 to 10 m tall with dark, rough bark, and bears its flowers profusely in spring on almost leafless branches. The other form, growing under less favourable conditions, is shrubby forming a low bushy growth and only occasionally developing into a tree. This ecotype flowers at any time from spring to autumn and, if late, then on leafy branches.

Found in fairly dry to dry areas; the spring-flowering tree form occurs in Natal, Swaziland and the Transvaal (also north-eastwards to the Ethiopian border); the shrubby late-flowering form is found on the central plateau of South West Africa/Namibia and also in parts of Botswana.

NATAL.—Durban: 'Port Natal', *Gueinzus* s.n. Camperdown: Inchanga, *Marloth* 4084. Hlabisa: Hluhluwe Game Reserve, *Ward* 1408. Inanda: Umhlanga, *Medley Wood* 7942 (NH). Ubombo: Mkuze Game Reserve, *Oatley* M6 (NH).

SWAZILAND.—Hlatikulu: Ebataan River, *Compton* 27955. Mbabane: Komati Bridge, *Compton* 26980. Stegi: *Verdoorn* 1667a.

TRANSVAAL.—Barberton: *Galpin* 407. Lydenburg: Sekukuniland, *Barnard* 35. Nelspruit: Pabinspruit, *Van der Schijff* 47. Piet Retief: Mooihoek, *Devenish* 26. Pilgrims Rest: near Skukuza, *Codd* 4391. Potchefstroom: Boskop, *Louw* 357. Pretoria: The Willows, *Codd* 7582; Meintjies Kop, *Burt Davy* 2188; Fountains, *Verdoorn* 465. Rustenburg: Swaruggens, *Sutton* 783. Soutpansberg: Louis Trichardt, *Koker* 16. Waterberg: Mosdene, *Galpin* M.33.

S.W.A./NAMIBIA.—Grootfontein: *Kings* 2966. Maltahöhe: Tsarris, *Marloth* 5072. Okahandja: Kaiser Wilhelms Berg, *Marloth* 1346. Okavango: Runtu, *Banks* 91, Otjiwarongo: Tue Kop-

pie, *Bradfield* 13. Swakopmund: *Boss sub TRV* 36121. Windhoek: *De Winter* 2595.

The commoner form of this typical variety, in the adult stage, is conspicuous during early spring because of its profuse white (rarely pink) flowers borne on almost leafless, rough-barked trees. The same variety on the central plateau of South West Africa/Namibia and in places in Botswana, is hardly recognizable because it occurs as a bushy shrub, only here and there reaching tree form, and flowers at any time from spring to autumn, the flowers and leaves appearing together.



ALEIDA V. D. MERWE.

FIG. 1.—*Dombeya autumnalis* Verdoorn. Flowering branch taken from the type specimen when collected at Penge in April 1965: 1, bud with reflexed calyx, $\times 4$; 2, petal, $\times 4$; 3, portion of the united stamens showing one staminode and 3 stamens, $\times 4$; 4, ovary and style, $\times 4$; 5, leaf, $\times 1$.

Botanical collectors look upon the latter form as an ecotype, the differences probably being caused by the struggle for existence under adverse conditions. Specimens from all parts agree in the suborbicular leaves and the bristly hairs on the ovary.

(b) var. *velutina* Verdoorn in Bothalia 9: 144 (1966); M. Friedrich *et al.* in FSWA 84: 3 (1969). Type: Rehoboth, Naukluft, Aub Schlucht, *Strey 2010* (PRE, holo.; BOL; NBG).

Tall shrubs with several virgate stems up to 5 m tall; bark rough; new growth softly and shortly tomentose. *Leaves* suborbicular or broadly oblong-orbicular, broadest in the upper half, 3–9 cm long, 2,5–9,5 cm broad, velvety-tomentose on both surfaces (the tomentum made up of minute stellate-pubescent scales, the hairs short and silky), crenate-dentate, cordate at the base, palmately 4–7-nerved; petiole 1–2 cm long, softly tomentose. *Cymes* crowded on lateral and terminal branchlets; peduncles 10–15 mm long; pedicels 7–10 mm long. *Calyx* about 6 mm long, densely and shortly tomentose without. *Petals* about 7 mm long. *Stamens* united at the base for about 0,5 mm; filaments unequal, about 2,5 mm long; staminodes about 5 mm long. *Ovary* densely and shortly stellate-tomentose (not setose); style 2–3 mm long, stellate-pubescent.

To date recorded only from the banks of the permanent stream at Aub Schlucht in the Naukluft Mountains, South West Africa/Namibia.

S.W.A./NAMIBIA.—Rehoboth: Aub Schlucht, Naukluft Mountains, *Strey 2328*; *Tölken & Hardy 666*; *Hopfield, Giess 10961*.

This variety agrees with the typical one in the suborbicular leaves and the rough bark on mature stems. This latter feature can be determined (as pointed out in notes under *D. autumnalis*) by the examination of a cross-section of a branchlet; the outer layer is seen to be rather thick and porous. It differs from the typical variety principally in the habit and the pubescence. The plants are tall, virgate shrubs with several comparatively slender stems and do not develop into trees, whereas typical *D. rotundifolia*, as found in South West Africa/Namibia, occurs as a low bushy shrub which, under certain conditions, grows into the characteristic rough-barked tree. The pubescence, which is a stellate tomentum as in the typical variety, differs in that the hairs are much shorter and rather silky, forming a dense, velvety covering. This short tomentum is of particular significance on the ovary because in typical *D. rotundifolia*, throughout the length and breadth of its distribution, the ovary is setose as well as stellate-tomentellous.

8. *Dombeya autumnalis* Verdoorn in Bothalia 9: 143 (1966). Type: Lydenburg, Penge Mine, *Verdoorn 2470* (PRE, holo.).

Shrub or small tree, 1,6–5 m tall. *Branchlets* slender, leafy, new growth shortly stellate-pubescent, the pubescence formed of short spreading hairs from

a scaly base. *Stipules* caducous, deltoid or linear-subulate from a deltoid base, densely pubescent. *Leaves* more or less orbicular, 1,5–5 cm long, 1–5 cm broad (on flowering branches), densely to sparsely stellate-pubescent on both surfaces, finely crenate-dentate on the margins, reticulate veins rather obscure beneath; petiole slender, 2–12 cm long, stellate-pubescent. *Cymes* in the axils of the upper leaves often overtopping them, sometimes shorter; peduncles slender, about 2,5 cm long, pubescent; pedicels very slender, 1–1,5 cm long, pubescent. *Bracts* 3, 1 or 2 at the calyx-base, or all scattered on the pedicel, linear-navicular, about 2,5 mm long, pubescent on both surfaces. *Calyx* rounded at the base, united for 0,5 mm; lobes reflexed, about 4 mm long, 2 mm broad, dorsally stellate-pubescent. *Petals* persistent, white turning cinnamon-rufous with age, about 7 mm long, 5 mm broad. *Stamens* united at the base for more or less 1 mm, filaments with the longest about 2,5 mm long; anthers up to 1 mm long; staminodes about 5 mm long. *Ovary* globose, about 3 mm in diameter, shortly stellate-tomentose (not setose); style glabrous or minutely stellate-pubescent, about 2 mm long, branches about 2 mm long; ovules 2 in a cell. *Capsule* about 5 mm in diameter, stellate-tomentose. Fig. 1.

Recorded from the eastern Transvaal in mountainous country on mesophytic, well wooded slopes among rocks and in riverine bush.

TRANSVAAL.—Lydenburg: Abel Erasmus Pass, *Schlieben & Strey 8387*; *Codd 10027*; near Penge mine, *Codd & Dyer 7737*; *Codd & Verdoorn 10488*; *Repton 5936* (partly); *Verdoorn 2470*; near Weltevreden Asbestos Mine, *Verdoorn 2471*. Letaba: Dublin Mine, *Miller 4271*.

D. autumnalis differs from the form of typical *D. rotundifolia*, which occurs in the eastern and central areas of southern Africa, in that it flowers in late summer and autumn together with its leaves, and not in early spring only, on more or less leafless branches. From all forms of *D. rotundifolia*, including those in South West Africa/Namibia, *D. autumnalis* differs mainly in that its slender stems do not develop a rough bark. This feature can be determined by the examination of a cross-section of a branchlet. The outer layer of *D. autumnalis* is thin and solid, whereas that of *D. rotundifolia* is thick and porous. A further diagnostic character is that the pubescence on the ovary of *D. rotundifolia* is setose as well as stellate-tomentellous, whereas in *D. autumnalis* it is stellate-tomentose without setae (see Fig. 1). In the slender peduncles and pedicels, the comparatively thin leaves, and the habit, our species resembles *D. cymosa*, from which it can be readily distinguished by the leaf shape. In *D. cymosa* the leaves are acuminate in the upper third, not suborbicular, and more or less rounded at the apex.

UITTREKSEL

Die spesies van Dombeya Cav. wat in suidelike Afrika voorkom, is hersien en 'n sleutel van die agt spesies in dié gebied word verskaf. D. quinqueseta (Del.) Exell, wat vir die eerste keer vir suidelike Afrika aangeteken word, is ingesluit.

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