

# A new species of *Cussonia* (Araliaceae) from the Transvaal

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*Cussonia transvaalensis* Reyneke, a new species from the Transvaal, is described. It is closely allied to *C. spicata* Thunb. Differentiating characteristics include the extremely complex grey-green multidigitately compound leaves with even the ventro-lateral primary leaflets articulated, the existence of secondary and tertiary leaflets with entire margins and flowers each subtended by a single hypsophyll (bract).

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*Cussonia transvaalensis* Reyneke, 'n nuwe spesie van Transvaal, word beskryf. Hierdie soort is nou verwant aan *C. spicata* Thunb. Onderskeidende kenmerke behels ondermeer die besonder komplekse grys-groen meerhandvormig saamgestelde blare waarvan selfs die ventro-laterale primêre blaartjies geartikuleer is, gaafrandige sekondêre blaartjies asook 'n enkele hipsofil aan die basis van elke blom.

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## Introduction

A taxonomic revision of the genus *Cussonia* Thunb. (Reyneke 1981, 1982) revealed that the *Cussonia spicata* group is represented by three varieties as well as a hitherto undescribed species. Because the distribution (Figure 4A) of this species is limited to the central Transvaal, the name *Cussonia transvaalensis* Reyneke sp. nov. is applied.

The reason why this species has hitherto escaped notice is that it has been confused with both *C. paniculata* Eckl. & Zeyh. because of its glaucous leaves, and with *C. spicata* Thunb. because of its complex leaves.

The first record of this species in the literature came from Von Breitenbach (1965) who used illustrations of its leaf to supplement a description of *C. spicata* Thunb. The presence of tertiary leaflets, unwinged stalks of the primary leaflets and leaflet margins which are all entire, show that the illustration by Von Breitenbach actually represents *C. transvaalensis* Reyneke.

A second possible reference to *C. transvaalensis* is found in Palmer & Pitman (1973). According to these authors it is difficult to distinguish between *C. spicata* Thunb. and *C. paniculata* Eckl. & Zeyh. Reyneke (1981) has, however, demonstrated that *C. paniculata* with its monodigitately compound leaves (Figure 1E) is easily distinguishable from *C. spicata* (Figures 1C & D), and indeed from *C. transvaalensis*, with their multidigitately compound leaves (Figure 1A).

From the work of Palmer & Pitman (1973), it is obvious that they were not aware of Strey's valuable publication on the Araliaceae which appeared in the same year (1973). Accordingly, their statement that more species should emerge from the complex *C. spicata* group was justified with the descriptions of *C. sphaerocephala* Strey (1973), *C. gamtoosensis* Strey (1975) and now *C. transvaalensis*.

In 1975 Reyneke & Van der Schijff published a terminology to describe the different parts of the digitately compound leaf of *C. spicata*. It has since become clear that the extremely compound leaf which was chosen for the study belongs to *C. transvaalensis* (Figure 1A) and not to *C. spicata*.

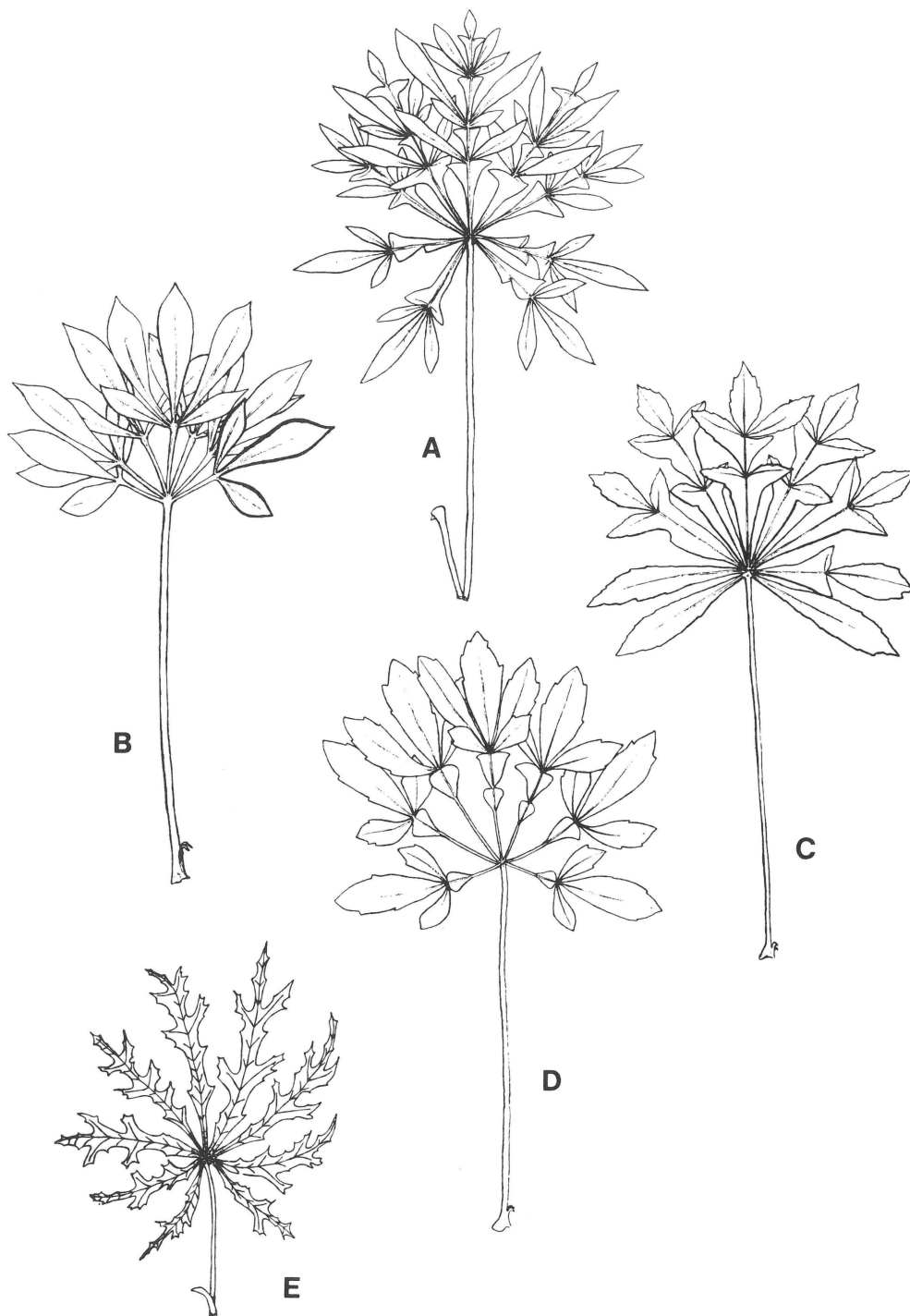
## Description

*Cussonia transvaalensis* Reyneke, sp. nov., *C. spicata* Thunb. affinis, sed differt foliis viridi-griseis et multidigitatis, foliolis primariis lateralibus mono-articulatis sed dorsalibus ut maximum tetra-articulatis, foliolis secundariis et tertiariis

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**Figure 1** Leaves of a few *Cussonia* spp. (A) *C. transvaalensis* ( $\times \frac{1}{4}$ ); (B) *C. gamtoosensis* ( $\times \frac{1}{4}$ ); (C) *C. spicata* (Transvaal and Natal) ( $\times \frac{1}{4}$ ); (D) *C. spicata* (eastern Cape) ( $\times \frac{1}{4}$ ); (E) *C. paniculata* (Transvaal and Natal) ( $\times \frac{1}{2}$ ).

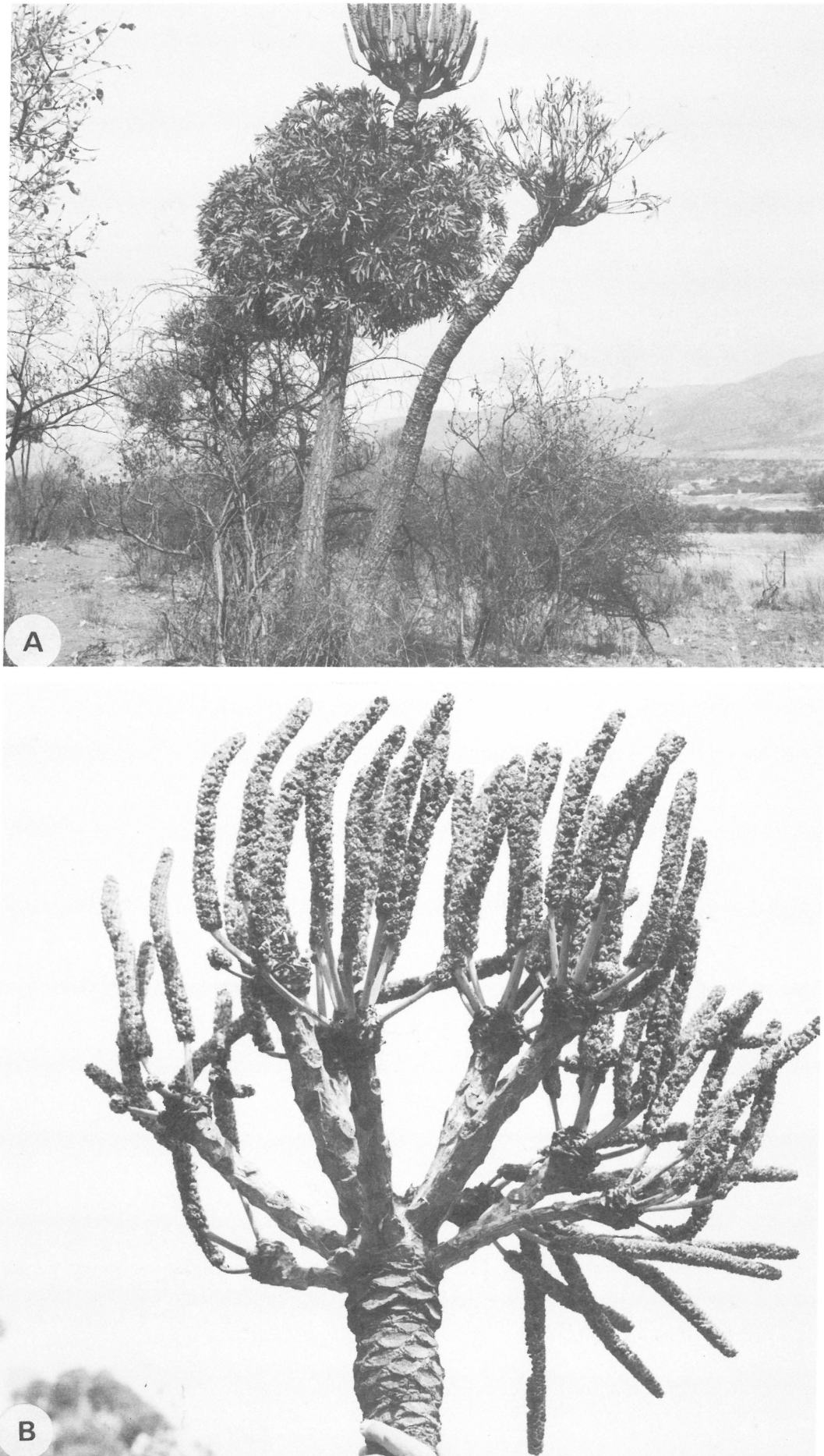
foliolorum primariorum itidem articulatis, marginibus foliolorum integris, floribus subtentis bractea unica.

*Cussonia spicata* sensu Von Breitenbach, Indig. Trees S. Afr. 4: 858–860 (1965); sensu Reyneke & Van der Schijff, Jnl Arnold Arb. 56, 2: 256–263 (1975); non Thunb.

TYPE. — Transvaal, 2430 (Pilgrim's Rest): Abel Erasmus Pass (-DA), September 1982 Reyneke 381 (PRE, holo.; PRU).

Evergreen trees up to 5 m high, monocaulescent, seldom polyculescent and then with a maximum of 4 stems; trunk up to 300 mm in diameter, somewhat branched. Bark grey

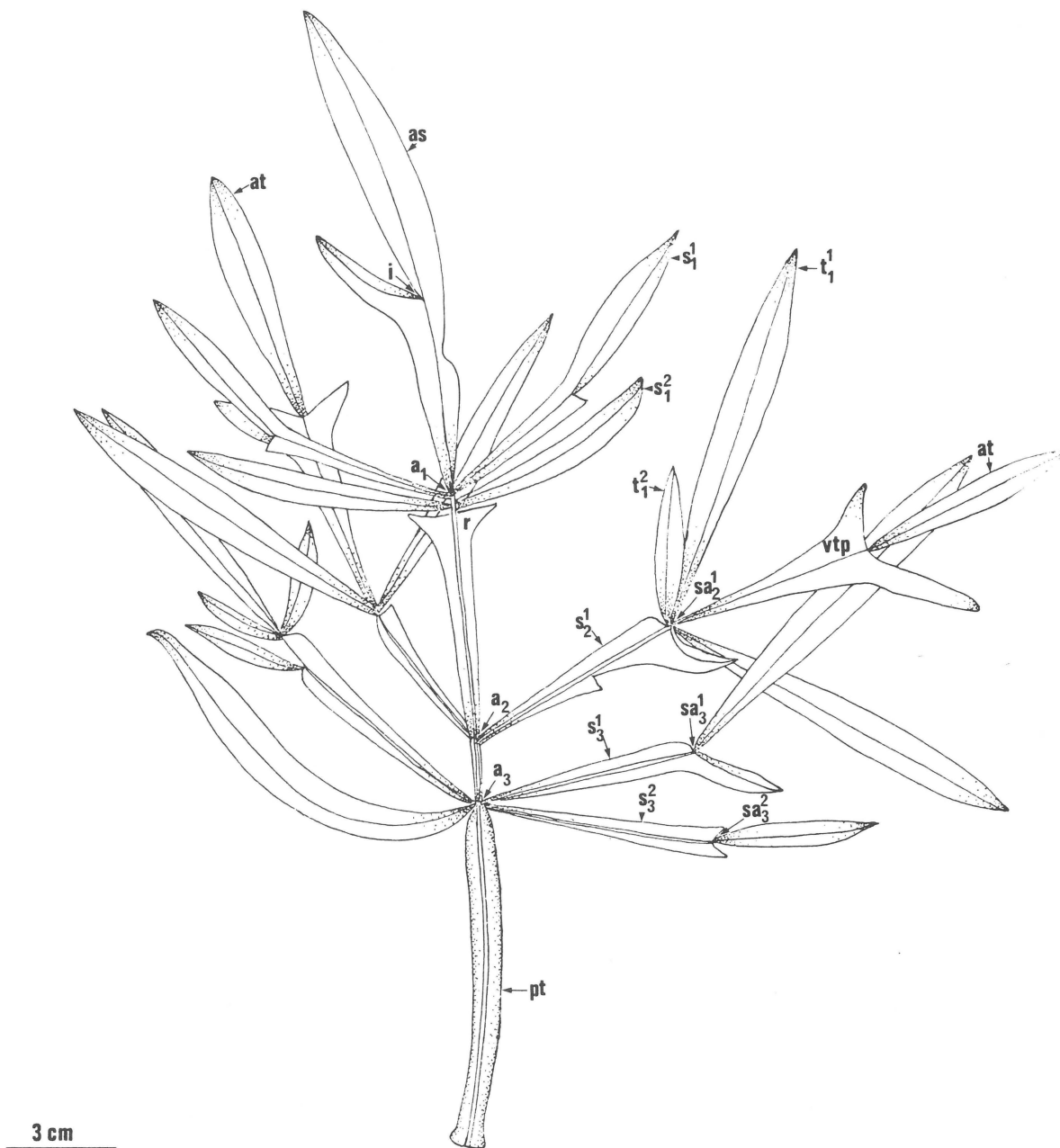
with longitudinal and transverse furrows, corky. Leaves alternate, petiolate and in rosettes on the ends of branches, always multidigitately compound and particularly complex. Petiole ridged, (140)170–435(480) mm long; leaf base prominent with two persistent stipules. Lamina leathery, grey-green with (5)7–9(11) primary leaflets (digits). Primary leaflets articulate and petiolate; ventro-lateral primary leaflets with at least one articulation; dorsal primary leaflets with (2)3–4 articulations; articulations without stipellae; mid-rib of primary leaflets not prominent abaxially; stalks of primary leaflets (30)40–70(90) mm long. Secondary leaflets lanceolate, margin entire, size and complexity of secondary leaflets decreasing basipetally on primary leaflets, in very



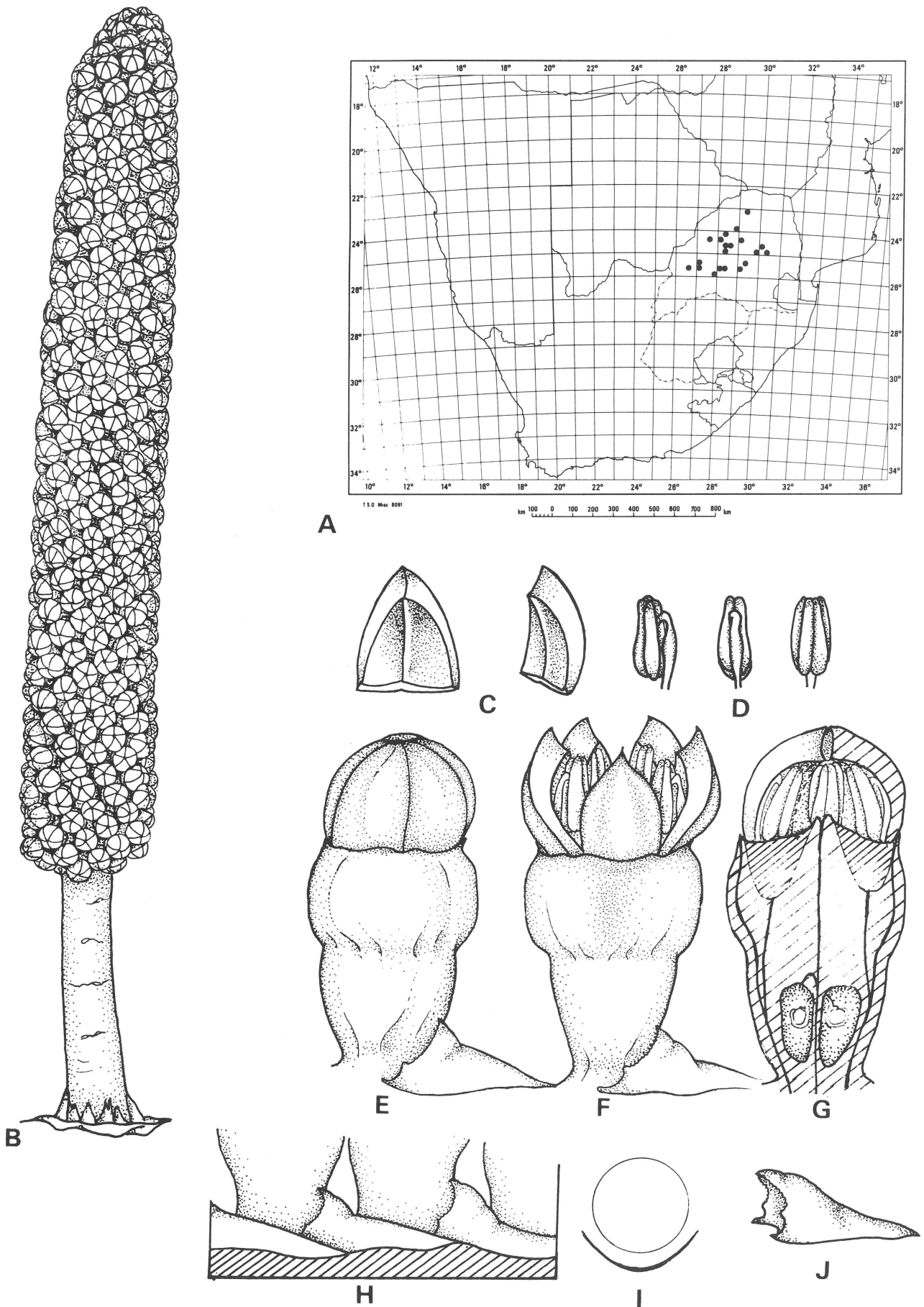
**Figure 2** (A) Two trees of *Cussonia transvaalensis* growing in the Abel Erasmus Pass. The tree on the left has a fully developed flowering system. Paracladia of the first order have already developed terminally on the tree on the right. (B) Mature flowering system consisting of a compound umbel of spikes.

complex leaves the secondary leaflets at articulation 2 larger than those at articulation 1; apical secondary leaflets (36)42–105(115) mm long and (11)14–26(30) mm wide in less compound leaves; if constricted and lateral tertiary leaflets occurring at the constriction (as in very complex leaves), the constriction then known as an articulation; lateral secondary leaflets of the first order at articulation 1 (for less compound leaves) or articulation 2 (for very compound leaves) (68)76–125(140) mm long and 9(11)–26(29) mm wide; lateral secondary leaflets of the second order usually present at articulations 1 and 2, (44)48–74(80) mm long and 8(10)–19(23) mm wide; sometimes lateral secondary leaflets of the first order at articulation 2 of very

complex leaves having a secondary articulation on which tertiary lateral and tertiary apical leaflets are borne; lateral secondary leaflets of the second order usually absent at articulation 3; articulations 4 and 5 usually lacking lateral secondary leaflets. *Flowering system* of spikes borne in terminal compound umbels (bi-umbelled spikes); paracladia of first order 7–13, 100–140(160) mm long, internodes elongated and leaf scars distinct; spikes borne in terminal umbel on paracladia of the first order; 7–11 spikes per paracladium; peduncle of spike 30–50(60) mm long and of rachis (90)115–150(180) mm long; dry spikes (15)20–30 mm in diameter. *Flowers* 7–9 mm long prior to anthesis, sessile, angular, densely packed on axis, each subtended by a single



**Figure 3** An articulated dorsal primary leaflet of *Cussonia transvaalensis* explaining the terminology used in the text.  $a_1$  Articulation 1;  $a_2$  articulation 2;  $a_3$  articulation 3; at apical secondary leaflet; at apical tertiary leaflet; i constriction; pt stalk of primary leaflet; r winged rachilla;  $S_1^1$  first order lateral secondary leaflet at articulation 1;  $S_2^1$  second order lateral secondary leaflet at articulation 1;  $S_3^1$  first order lateral secondary leaflet at articulation 2;  $S_2^2$  first order lateral secondary leaflet at articulation 3;  $S_3^2$  second order lateral secondary leaflet at articulation 3;  $sa_2^1$  secondary articulation 1 of the first order lateral secondary leaflet borne on primary articulation 2;  $sa_3^1$  secondary articulation 1 of the first order lateral secondary leaflet borne on primary articulation 3;  $sa_2^2$  secondary articulation 2 of the second order lateral secondary leaflet borne on primary articulation 2;  $sa_3^2$  secondary articulation 2 of the second order lateral secondary leaflet borne on primary articulation 3;  $t_1^1$  first order tertiary leaflet on secondary articulation 1;  $t_2^1$  second order tertiary leaflet on secondary articulation 1; vtp winged stalk of tertiary leaflet.



**Figure 4** *Cussonia transvaalensis*. (A) Distribution; (B) spike of inflorescence; (C) petals; (D) stamens; (E) flower prior to anthesis; (F) flower at anthesis; (G) longitudinal section of flower; (H) flower arrangement on axis; (I) position of hypsophyll in relation to flower; (J) hypsophyll. (B  $\times 1$ ; C-J  $\times 9$ ).

carinate hypsophyll with a denticulate margin. *Sepals* 5, fused and much reduced. *Petals* 5, valvate, 2–3 mm long, 2 mm broad at base, caducous. *Stamens* 5, alternating with petals, caducous; anthers oblong, two-locular, ovate, versatile, dorsifixed, introrse, 1.5–2 mm long; filament hook-shaped, 1.5–2 mm long. *Ovary* inferior, bilocular; styles 2, not spreading, 0.5–1 mm long; stylopodium oblate, circular, with a peripheral ridge, rugous; ovule pendulous, one per locule. *Fruit* a conical purple drupe. *Seed* 5–7 mm long, 3–4 mm wide, plano-convex, anatropous, raphe ventral, testa brown (Figures 2, 3 & 4).

### Discussion

Like *C. spicata* and *C. gamtoosensis*, *C. transvaalensis* also belongs to the subgenus *Cussonia* (Reyneke 1982). Members of this subgenus are characterized by bidigitately or multidigitately compound leaves, the flowering system being a compound umbel of spikes and wedge-shaped flowers compactly arranged on the axis of the inflorescence.

*C. gamtoosensis* is a well-defined species that shows little variation. The species can be distinguished from other members of the subgenus by its glaucous leaves which are bidigitately compound (Figure 1B), its entire recurved leaflet margins, a spike with a short axis (20–60 mm) and flowers with three hypsophylls at the base. Distribution is limited to the Gamtoos River valley in the eastern Cape.

*C. spicata* on the other hand shows much variation in growth form and leaf morphology. Distinguishing features are the dark green colour of the multidigitately compound leaves (Figures 1C & D), the prominent midrib of the leaflets, leaflet margins which are at least apically toothed and the presence of abaxial stipellae on the articulations.

Depending on the growth form flowers can either be subtended by one or three hypsophylls. In southern Africa *C. spicata* is widely distributed throughout the southern and eastern parts of the country.

*C. transvaalensis* is closely allied to *C. spicata*. Differentiating characters for *C. transvaalensis* are the glaucous colour of the multidigitately compound leaves, primary leaflets which are particularly compound (Figures 3 & 1A), leaflets without a prominent midrib, entire leaflet margins, the absence of stipellae on the articulations and a single hypsophyll subtending each flower. In extreme cases the primary leaflets may have up to four articulations and tertiary leaflets are present (Figure 3).

*C. transvaalensis* grows on sandy loam derived from sandstone and quartzite. It is restricted to rocky koppies (Figure 5) and mountain ranges, e.g. Magaliesberg, Waterberg, Soutpansberg and Drakensberg in the central Transvaal (Figure 4A) and flowers from September to February.

*C. transvaalensis* is a beautiful tree which can be used with great success in landscaping gardens. In contrast to *C. spicata* which is frost sensitive, it grows in cold areas where frost is frequent. Furthermore, it has a beautiful grey colour like *C. paniculata* and does not grow much higher than 5 m.

The description of *C. transvaalensis* brings the total number of described *Cussonia* spp. to 18 in contrast to 40 or 50 as mentioned by Strey (1981). Of these, eight species are represented in South Africa.

### Specimens examined

TRANSVAAL. — 2328 (Baltimore): Pyramid Estate near Potgietersrus (–DD), Galpin 8815 (PRE). 2329 (Pietersburg): Le Juma plateau (–AB), Schlieben 10642 (PRE). 2427 (Thabazimbi): Kransberg



Figure 5 *Cussonia transvaalensis*. A monocaulous tree in the Abel Erasmus Pass near Ohrigstad.

(-BC), *Codd 6485* (K, PRE). **2428** (Nylstroom): Palala Height (-AB), *Verdoorn 2215* (PRE); Alma (-AC), *Van Wyk 80* (PRE); Nylstroom (-CB), *Coetzee 937* (K, PRE), *Strey 10374* (NH, PRE); Warmbaths (-CD), *Gerstner 5288* (PRE); Mosdene (-DA), *Galpin s.n.* (PRE). **2429** (Zebediela): Mogotokloof (-AC), *Robbertse 456* (PRU); Schoonoord (-DD), *Barnard 92* (PRE). **2430** (Pilgrim's Rest): Lulu Mountains, Farm Avontuur (-CA), *Mogg 16913* (PRE); Spekboom River (-CD), *Strey 3277* (K, PRE). **2526** (Zeerust): Swartruggens (-DA), *Louw 757* (PRE). **2527** (Rustenburg): Boshhoek (-AC), *Rose Innes 44, 45* (PRE); Rustenburg (-CA), *Galpin 11526* (PRE), *Leendertz 9799* (PRE), *Nation s.n.* (K), *Van Belkum 20536* (PRE); Hartebeespoort dam (-DD), *Bruce 113* (BR, NH, PRE). **2528** (Pretoria): Wonderboompoort (-CA), *Mogg & Dyer s.n.* (K, PRE); Meintjieskop (-CB), *Strey 10397* (NH). **2529** (Witbank): Loskop Dam Nature Reserve (-AD), *Mogg 17257* (K, NH, PRE), *29510* (PRE), *Reyneke 280* (PRU), *Theron 1478, 1487* (PRU); Olifants River Kloof (-CA), *Mogg 22451* (PRE).

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