A taxonomic revision of Elaeodendron Jacq. (Cassinoideae: Celastraceae) in Africa

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Received 25 May 1997; revised 23 September 1997

The heterogeneous genus, Cassine L. s.l. is subdivided into smaller, more natural genera, following new evidence from macromorphology, palynology and anatomy. Elaeodendron Jacq., one of the segregate genera, is here revised for Africa. The redefined genus Elaeodendron is cosmopolitan, with consists of 30 to 40 species of shrubs and trees distributed in Africa, Asia, Australasia and central America. Eight species of Elaeodendron are recognized in Africa. A new combination, *E. transvaalenses* (Burtt Davy) R.H. Archer (= *Cassine transvaalenses*) is proposed. The other species are *Elaeodendron aquifolium* (Fiori) Chiov., *E. buchananii* (Loes.) Loes., *E. croceum* (Thunb.) DC., *E. matabelicum* Loes., *E. schleichetianum* (Loes.) Loes. and *E. zeyheri* Spreng. ex Turcz. The correct application of the previously misapplied and confused name *E. croceum* is discussed.

**Keywords:** Cassine, Cassinoideae, Celastraceae, Elaeodendron, taxonomy.

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Introduction

This paper emanates from a multi-disciplinary study towards a taxonomic revision of the southern African Cassinoideae (Archer & Van Wyk 1996a). It has long been a matter of dispute whether to treat Cassine L. in a wide sense (e.g. Ding Hou 1962; Kostermans 1986), or to recognize a number of segregate genera, including Elaeodendron Jacq. (e.g. Loesener in Die natürlichen Pflanzenfamilien, 1942a). Following Archer (1990) and Archer and Van Wyk (1992, 1993a, 1993b, 1996a), five distinct southern African genera, the African/Madagascar Mystroxyllum and the cosmopolitan Elaeodendron, can be conclusively recognized on evidence from macromorphology, palynology, and anatomy.

Our present concept of *Cassine s. str.* largely follows Loesener (1942a), Robson (1965, 1966, 1989) and Robson et al. (1994) and necessitates many name changes back to the original basionyms in Elaeodendron for most species of *Cassine s.l.* from other parts of the world. Fortunately, most species have been well known under *Elaeodendron*, and in most cases correct combinations already exist. Approximately 40 species of *Elaeodendron* can be recognized from central America, Africa and Australasia. Eight taxa are confined to Africa, excluding the Mascarenes and Madagascar, and are here revised. One species, *Elaeodendron orientale* Jacq., which was treated as a cultivated species in Flora Zambesiaca (Robson 1966), seems to exist in that Flora area as a single tree in the Mutare Botanical Garden, Zimbabwe. A synopsis of the known species of *Elaeodendron* worldwide is in preparation and will be published elsewhere.

Herbarium specimens cited here are arranged by the quarter-degree reference system of Edwards and Leistner (1971). One specimen is cited per quarter degree square. Localities north of the equator, or west of Greenwich are indicated by the letters N or W after the longitude or latitude respectively. Codes following the geographical divisions of the *Flora of Tropical East Africa* (Pollhill 1988) have been added in the case of specimens cited for the latter region.

**Systematic treatment**

Elaeodendron Jacq., Icones Plantarum Rariorum t. 48 (1782); Murray: 241 (1784); as Elaeodendron, Jacq. f. s. 36 (1787), as Elaeodendri: Loes. 223 (1897); 172 (1942a); Thoms. 331 (1915); N. Robson: 385 (1966); N. Robson et al.: 29 (1994).

Type: *E. orientale* Jacq.

Rubianna Juss.: 378, 452 (1789); Gmel.: 408 (1791). Type: R. olivina L.F. Gmel. [*Elaeodendron orientale* Jacq.].

Schreberia Retz.: 25 (1791) nom. nec Schreb., nec Roxb. Type: *S. altbeus* Retz.

Portenschlagia Tratt.: 250 (1818). Type: *P. Australis* Tratt.

Noerijia Roxb.: 86 (1814); Carey et Wallich in Roxb.: 444 (1824); Carey in Roxb.: 646 (1832). Type: *N. dichotoma* Roxb.

Crocosyllum Eckl. & Zeyh., 128 (1834/5); Harv.: 50 (1838); N. Robson: 40 (1965); 390 (1966); N. Robson & Sousa: 36 (1969).

Type: *C. excelsum* Eckl. & Zeyh. nom. illeg. [*Elaeodendron croceum* (Thunb.) DC.].

Cassine Loes.: 214 (1892), pro parte excl. typum; Davison 2: 326 (1927) pro parte, sensu auct. plur., nom. L. Type: *C. Peragia* L. type prop. cons.

Cassine L. sect. *Elaeodendron* Loes.: 215 (1892).

Telemachia Urb.: 334 (1916). Type: *T. trinitensis* Urb. (*Elaeodendron australe* Vent.).

Pseudocassine Bredell: 330 (1937); Compton: 338 (1976). Type: *P. tristellata* (Burtt Davy) Bredell.

Evergreen or rarely deciduous shrubs to trees; unarmed, glabrous. without elastic threads (trans-1, 4-polyisoprene) in bark and leaves; bark with layers of yellow pigment occasionally present or hardly discernible. Branchlets subangular to terete, lenticels usually prominent. Leaves opposite or subopposite, or occasionally alternate, spiral to fasciculate; stipules minute, ± 1 mm long, ± triangular, mescent. *Inflorescences* usually pedunculate, dichasial. Flowers usually bisexual, occasionally unisexual, sometimes with petaloid staminodes in female flowers; 3-, 4- or 5-merous (except ovary), pedicellate. *Sepals* equal, subclavate. *Petals* cream to greenish, oblong to ovate, entire or with ventral projections, spreading. Stamens erect to spreading, arising inside margin of disc or from sinuses in the margin of the disc; anthers introrse or extorse, dehiscing by longitudinal slits. Disc entire to subentire and convex, fleshy, or flat and quadrangular, with sinuses at the point of stamen insertion, flat to concave. *Ovary* ± immersed in and adnate to the disc; 2-, 3- or 4-locular, with two erect collateral ovules per locule; style short to absent, stigma inconspicuous. *Fruit* drupaceous, spheroid to...
Elaeodendron is one of the largest genera in the Celastraceae, consisting mostly of shrubs or trees. An estimated 30 to 40 species occur in central America, Africa, Asia and Australasia. Some members are commercially exploited or have potential for wood production.

The African species of Elaeodendron are more frequent in southern Africa and the eastern lowland parts of the continent. Three species, E. buchananii, E. matabelicum and E. transvaalense, also extend to the drier parts of western tropical Africa.

Much uncertainty exists in recent literature concerning the correct spelling and author citation of the name Elaeodendron (Archer & Van Wyk 1996b). Kostermans (1986) pointed out that Elaeodendron Murray has priority over Elaeodendron Jacq. f., while most authors consider either Jacq. f. or Jacq. to be the correct author of the generic name. Archer and Van Wyk (1996b) argue that Elaeodendron Jacq. (1782) is validly published as a plate with an analysis that it predates both Murray (1784) and Jacquin (1787).

Robson (1965, 1966) treated E. zeyheri (Cassine crocea auct. non Thunb.) and E. transvaalense under the genus Crocoxylon. The latter genus is supported by a distinctive pollen type with a rugulose-reticulate exine structure (Archer & Van Wyk 1992). However, several tropical African and extra-African species are intermediate (in pollen structure and flower morphology) between Elaeodendron and Robson’s concept of Crocoxylon. The key provided below gives some indication of the considerable variation in the number of floral parts in the African members of Elaeodendron. At this stage it is not considered feasible to recognize Crocoxylon as a segregate genus or even any supraspecific taxa. Incidentally, the name Crocoxylon is to be regarded as a synonym of Elaeodendron, typified by E. croceum (Thunb.) DC. (not Crocoxylon crocea (Thunb.) N. Robson).

Key to the African species of Elaeodendron

1a Flowers with ovary heteromorphic with other floral whorls, 2- or 3-locular ........................................................................ 2 1b Flowers with ovary isomerous with other floral whorls, 3- or 4-locular ................................................................. 7

2a Flowers 4-merous, ovary 2-locular ................................................... 3 2b Flowers 3-merous; Eastern Cape & KwaZulu-Natal, rare in Mozambique and Northern Province ................................................................... 7 3a Tree; leaf margin denticulate to prominent spinulose on juvenile shoots; fruit large, up to 30 x 15 mm, cream; southern Africa ........................................................................ 1. E. croceum 3b Shrub or small tree (usually less than 3 m high); leaf margin entire or rarely spinulose-denticulate; fruit small, up to 8 x 5 mm, white; coastal areas of east Africa ................. 2. E. schweinfurthianum

4a Shrub or small irregular tree; leaf margin prominently spinulose; ovary 2-locular; Somalia, Kenya .................................... 3. E. aquifolium 4b Tree; leaves serrate or glandular-crenulate, occasionally spinulose; ovary 2- or 3-locular ........................................ 5 5a Leaf teeth incurved; flowers unisexual; ovary 2- or 3-locular; staminodes petaloid ................................................... 4. E. buchananii 5b Leaf teeth spreading or incurved; flowers bisexual (rarely unisexual, then staminodes stamen-like); ovary 3-locular ........................................................................ 6

6a Leaf margin spinulose-denticulate, occasional subentire; lamina glossy greyish-green; southern tropical Africa and east Africa ................................................................................................. 5. E. schlechterianum 6b Leaf margin glandular-crenate; lamina pale yellowish-green; southern tropical Africa ........................................ 6. E. matabelicum

7a Flowers 4-merous; Eastern Cape & KwaZulu-Natal, rare in Mozambique and Northern Province ................................................................... 7 7b Flowers 3-merous; widespread in southern Africa ......................................................................................................................... 8

8a Flowers 2-locular ........................................................................................................... 1a 8b Flowers 4-merous; ovary 2-locular ........................................................................ 2

1. Elaeodendron croceum (Thunb.) DC. Prodromus 2: 11 (1825) [as Elaeodendron?]; Pappe: 10 (1854); Sond.: 468 (1860) pro parte; Marloth: 154 (1925); Archer & Condy: 38 (1995). Type: Thunberg, sheet 3807 in Herb. Thunb. (UPSI, holo).

flex croce Thunb.: 32 (1794a): 1; 169; 2: 137 (1794b) [original Swedish edition, 1788]; Thunb.: 577 (1818); 159 (1823). Cassine crocea (Thunb.) Kuntze: 114 (1891); Von Breitenbach: 637 (1965), pro parte; Coates Palgrave: 510 (1977) pro parte; non Davison: 334 (1927).

Elaeodendron capense Eckl. & Zeyh.: 127 (1834/5); Graham: 3835 (1841); Sond.: 468 (1860); Bak.: 45 (1911); Eyles: 404 (1916); Marloth: 154 (1925); Loes.: 173 (1942a); N. Robson: 386 (1966). Type: Cape, ‘Sylvis Sitiskamma & Krakakamma (Georg, Uitenhage). Flor Jul. Fruct. Febr., Ecklon & Zeyher s.n. (SAM!, leeto, here designated, S!, TCD!, Z!).

Elaeodendron papillosum Hochst. in Krauss: 305 [(1844) reprinted: 42 (1846)]; Ettingshausen: 58 (1857). Cassine papillosa (Hochst.) Kuntze: 114 (1891); Davison: 334 (1927) pro parte exc. syn. C. lacinulata Loes.; Palmer & Pitman: 1321 (1973); Von Breitenbach: 228 (1974); Coates Palgrave: 511 (1977); Coates Palgrave et al.: 64 (1985); Pooley: 278 (1993). Type: ‘Sylysis prope Natal, Julio 1839’, Krauss 270 (TUB, holo., BMW, K!, MO!, S!, TCD!).

Olea sp. Mellis: 312 (1875).

Icones: Graham: t. 3835 (1841); Von Breitenbach: 229 (1974); Coates Palgrave et al.: 64 (1985); Archer & Condy: t. 2112 (1995).

Medium to tall evergreen tree, glabrous; bark greyish with layers of powdery yellow pigment in exposed rhytidome, exfoliating in thin scales, surface longitudinally fissured. Branchlets subangular to terete, grey-brown, lenticels prominent, black. Leaves opposite; winged elliptical to oblong, dark green above, paler green below. 15–35–75 (–220) x 10–15–45 (–70) mm, base attenuate to cuneate, apex acute to acuminate, margin glandular-denticulate to prominently spinulose dentate on juvenile shoots; coriaceous; venation indistinctly brochidodromous to semi-craspedodromous in juvenile leaves, ± raised above and below in dried material, fine reticulation less conspicuous; petiole 4–10 mm long; stipules brownish black. Inflorescences axillary towards apices of branchlets, usually pedunculate, ± compact dichasial, 1–15-flowered, peduncle (0) 3–12 mm long; bracts minute, bracteoles occasionally present. Flowers bisexual, 4-merous, ± 3 mm in diam., pedicels 1–2 mm long. Sepals greenish, ovate, 1.5 x 1 mm, fleshy. Petals whitish green, broadly ovate, 1.5 x 1.5 mm, spreading. Stamens erect to spreading; filaments 0.5 mm long, anthers 0.5 mm long, dorsifixed, introrse. Disc quadrangular, subentire with sinuses at the point of stamen insertion, flat to concave. Ovary 2-locular; style and stigma inconspicuous. Fruit drupeaceous, ellipsoid, cream, 20–32 x 10–15 mm, stone narrowly elliptic, tipped at both ends. Seeds pale brown, narrowly ellipsoid, 15–20 x 4–5 mm; embryo with fleshy cotyledons (Figure 1).

Elaeodendron occurs on the margins of coastal and montane forest from near Ladismith in the Western Cape to northern KwaZulu-Natal in the east, as well as in isolated spots
Figure 1 Elaeocandron croceum. 1. Flowering branch, ×1; 2. juvenile leaf, ×1; 3. flower, ×10; 4. fruit, ×1.5; 5. seed, ×1.5. Drawn by Anne Stadler from Archer 2090 (PRE); 2. from Taylor s.n. PRE 802953 (PRE).
along the Mpumalanga and Eastern Zimbabwe escarpment (Figure 2). It is most abundant and well known in the southern Cape forests where it was once popular for its bright yellow, durable wood. It is also naturalized and fairly abundant in St. Helena, having spread from plantations of the species established. Mellis (1875) considered this species, which he placed under Olea 5 sp. and called wild olive, as very common and ‘one of the handsomest trees on the island’. E. croculeum is distributed by fruit bats, Rameron Pigeons and even elephants (pers. obs.; Phillips 1925, 1927; Herzig-Straschil & Robinson 1978). Flowering occurs sporadically in summer. Fruit usually ripens about after a year.

Thunberg (1794b) and Pappe (1858) recorded the use of the fine and durable wood of E. croculeum for the making of all kinds of furniture, building material, wagons as well as buttercasks. Most parts of the plant are poisonous and valued for medicinal and magical properties (Watt & Bryer-Brandwijk 1962). Elaeodendron croculeum is a decorative garden plant. Flavonoids and triterpenoids from this species have been studied by Drewes and Mashinbya (1993).

Elaeodendron croculeum has been subject to nomenclatural confusion and name changes, evident in literature and on herbarium sheets. Since Ecklon and Zeyher (1834/5), most authors have mistaken the identity of Thunberg’s Ilx croculeum. The type specimen was carefully studied at UPS and there can be no doubt as to its identity. It is likely that Thunberg encountered this species in the Grootvadersbosch, near Swellendam (Thunberg 1794b). On a subsequent visit in 1774, Thunberg was disappointed in again finding few trees in flower or fruit, but continued collecting sterile specimens, certainly amongst others the present species. Elaeodendron croculeum is frequent in the southern Cape, while the species with which many authors have confused it, E. zeyheri (Cassine croculea act.), does not occur west of Port Elizabeth.

The responsibility for this nomenclatural confusion can evidently be laid upon Ecklon and Zeyher (1834/5), who published E. capensis, but also chose a superfluous name Croxylon excelsum as the new name for E. croculeum. The generic description of Croxylon and the specimens cited, however, correspond with Elaeodendron zeyheri. This confusion has been perpetuated by most subsequent workers, e.g. Robson (1963, 1966) and Coates Palgrave (1977), the latter publishing a description of Cassine croculea act. that applies to E. croculeum. Most information in literature on forestry and wood hitherto published under E. croculea act. applies to E. croculeum.

Several vernacular names, including ‘Saffron’ (or ‘Common Saffron’, ‘Saffron wood’) and ‘geelhout’ (yellow wood) were first recorded by Thunberg (1794b). The specific epithet chosen by Thunberg refers to the presence of a bright yellow pigment in the bark.

Selected specimens examined
Zimbabwe
—1832 (Mutare): Umbiti, N Vumba, SSW of Lion Rock, (BA). Muller 337/8 (SRGH). Inyangwa [Nyangwa], Nyamuzi [Hwa River (BA), Wild 1573 (K, SRGH). Inyangwa [Nyangwa], Forest on summit of Hondo, Mt Kukwangwa Training School (BA). Chase 8475 (K, SRGH). Mutare, Gunner’s Way Cecil Kop Nature Reserve (DC).
—1966 (Musseter): Brunha, plot Mrs Hayter, 23.5 km from Mutare (BB), Van Wyk BSA 1177 (PRE, PRU); Musseter, Tarka Forest Reserve (DD), Goldsmith 27/6 (B.J.K. MO, P, PRE, SRGH).
—2032 (Chipping): Mount Selinda, between Mission station and border post (BA), Van Wyk BSA 1236 (PRE, PRU); Gungunyana Forest Reserve, Top of Chiredza Gorge (BC), Goldsmith 25/7 (K, PRE, SRGH).

South Africa
—2229 (Waterpoort): Hlanglip (DD), Legat 68 (K).
—2302 (Messina): Mameke (CC), Netshangana 3456 (1, PRE).
—2329 (Petersburg): Happy Rest (BB), Gerstner 6092 (PRE).
—2330 (Tzaneen): NHS, Black Forest, Ngomi (Ngomi) (CD).
—2371 (Louwsburg): Mist Belt Forest, Ngomi (Ngomi) (CD), Gerstner 4442 (PRE).
—2372 (Umombo): Sibaya (AA), Green Shyhi Project 333 (GRA, PRE).
—2373 (K): Krantzkloof Nature Reserve (BA), Schoepers 675 (K, PRE).
—2373 (Pelgrim’s Rest): The Downs (AA), Reuny DB50 (K, PRE).
—2371 (Louwsburg): Mist Belt Forest, Ngomi (Ngomi) (CD).
—2372 (Umombo): Sibaya (AA), Green Shyhi Project 333 (GRA, PRE).
—2373 (K): Krantzkloof Nature Reserve (BA), Schoepers 675 (K, PRE).
—2373 (Pelgrim’s Rest): The Downs (AA), Reuny DB50 (K, PRE).
—2371 (Louwsburg): Mist Belt Forest, Ngomi (Ngomi) (CD).

Figure 2 Known distribution of Elaeodendron croculeum.
Untamvuna River (–CC), Nicholson 1312 (PRE); Uvongo River (–CD), Nicholson 1341 (PRE).

3329 (Port St Johns): Coffee Bay (–CC), Wells 3512 (GRA); Hluhluwe Forest near Ngculeni (–CD), De Winter 8829 (PRE).

3310 (Port Edward): Untamvuna Nature Reserve (–AA), Abbott 6348 (PRE).

3326 (Port Beaufort): Amatole Mountains, near Cat (–CA), Fawcett & Phillipson 265 (MO, PRE); Amatole Mountain, Hoogskab Pass (–DB), Phillipson 883 (K, PRE, UPS). Dal Eendracht Farm, S of Alice (–DD), Giffen F11-2259 (PRE).

3327 (Stutterheim): Keiskamma Hock, Wolf River Forest (–CA), Wells 239 (GRA, PRE); Stutterheim, 8.4 mile from Stutterheim on Keiskamma Hock road (–CB), Morris 527 (BOL, GRA, K, PRE); Picie (–CB), Sio 2154 (BOL, NBG, PRE); King Williamstir, Picie Forest (–CC), Von Gadow 213 (GRA); 3 mile from Amabcle (–DA), De Vries 114 (PRE).

3328 (Buitewater): 12.4 mile from Buitewater on Kentani road (–AD), Marais 498 (GRA, K, PRE); 9.2 mile from Elliotdale on Willowvale road (–BA), Marais 493 (GRA, K, PRE); 2 mile inland of of The Haven, Bashlee Mouth (–BB), Wells 3557 (GRA, PRE); Dwessa Forest Reserve (–BD), Marais 486 (BOL, GRA, K, PRE); Kei Mouth (–CB), Flanagan 562 (GRA, MO, NBG, P, PRE, Z); Queensberry Bay (–CC), Acocks 21058 (PRE); Wavecrest (–DA), Laboe 4754 (GRA).

3321 (Ladismith): Zwartebergen, Seven Weeks Poort (–AD), Marloth 5445 (PRE).

3322 (Outdshoorn): George (–CD), Prior (K, MEL, PRE, Z); Ebb and Flow Nature Reserve, valley of the Touw River (–DC), Taylor 799 (PRE, STE); Knysna, Millwood (–DD), Lam & Meunier 4724 (S).

3333 (Willowmore): Deepwalls Forest (–CC), Box 857 (B, LISC, STE); Blauwkrantz Pass (–DC), Golpin 3885 (GRA, PRE); Storms River High Forests (–DD), Keet 544 (GRA, STE).

3325 (Port Elizabeth): Groendal Wilderness Reserve, Zunga Catchment basin (–CA), Schaar 1520 (K, PRE); Port Elizabeth, Springfields (–CB), Paterson 2190 (PRE).

3326 (Grahamstown): Howieson’s Poort (–AD), Macowan 713 (BM, BOL, K, P, PRE, UPS, Z).

3327 (Paddies): Fort Grey Forest Reserve (–BB), Wells 3911 (GRA, LISC, PRE).

3422 (Mossel Bay): Skaphkop River Mouth (–AB), O’Callaghan, Fellingham & Van Wyk 158 (PRE, STE); Kaaimans River, on National road from Mossel Bay to Wilderness at picnic spot (–BA), Marsh 1307 (K, PRE, STE); Grookamma Nature Reserve (–BB), van der Merwe 2175 (PRE, STE).

3423 (Knysna): Knysna (–AA), Burchell 3527 (K); Keurbos River (–AB), Gillet 3136 (BOL, STE).

St. Helena

5505W St. Helena, Plantation, Nielsen 1617 (C).

2. Elaeodendron schweinfurthianum (Loes.) Loes. in Natürlichen Pflanzenfamilien. III. 5. Nachr.: 223 (1897); 173 (1942a); Loes. & Engl.: 233 (1921); Brenan & Greenway: 123 (1949); Beehner: 337 (1994); N. Robson et al.: 31 (1994). Type: Somalia, Brava [Barawa], Hildebrandt 1322 (K, lecto., designated here, BM).

Cassinia schweinfurthiana Loes.: 550 (1893); 247 (1895b); Chiov.: 51 (1916); 132 (1932); Dale & Greenway: 133 (1961).

Elaeodendron somalense Vatke in scheda, Loes.: 550 (1893); Eng.: 366 (1904).

Elaeodendron schweinfurthianum (Loes.) Loes. var. cyclophyllum Chiov.: 132 (1932). Synotypes: Somalia, Brava, Scassellati 218; 219 (FI); Cu Dao, Senii 41 (FI).

Elaeodendron schweinfurthianum (Loes.) Loes. var. obovatum Chiov.: 132 (1932). Type: Somalia, Bur Gaoo, Senii 96 (FI).

Shrub or lax tree up to 3 m high; bark greyish brown, smooth or flaky, yellow pigment not observed. Brenchlets subangular, grey, lenticels prominent, grey. Leaves opposite; lamina obovate, greyish green, (25–)30–40 (50) x (8–)10–20 (30) mm, base attenuate, apex rounded to minutely mucronate, margin entire, rarely with spinulose-denticulate teeth; coriaceous; venation brochidodromous, ± raised on both surfaces in dried material, fine reticulation less conspicuous above; petiole 4–7 mm long; stipules greyish. Inflorescences axillary, pedunculate, ± compact dichasial, (3)–10–flowered, peduncle 5–10 mm long; bracts minute, bracteoles occasionally present. Flowers bisexual (or unisexual, the respective parts not fully developed), 4-merous, ± 2.5 mm diam., pedicels ± 1 mm long. Sepals greenish, fleshy, depressed-ovate, 0.6 x 1 mm. Petals cream or greenish, broadly ovate, 1.5 x 1 mm, spreading, apex rounded, lower half of the lamina thickened with fringed projections towards the apex. Stamens erect to spreading; filaments 0.5 mm long, anthers 0.2 mm long, dorsifixed, intorse. Disc ± quadrangular, subentire with sinuses at the point of stamen insertion, convex. Ovary 2-locular; style ± 0.2 mm long, stigma entire or inconspicuously lobed. Fruit widely ellipsoid, white when ripe, 8 x 5 mm, stone elliptic, ends rounded; endocarp thin, 0.5 mm thick. Seed single, seed-coat brown, widely ellipsoid, 5 x 3 x 1 mm; embryo with fleshy cotyledons.

A characteristic species of coastal bushland, swamps and forest margins, close to the sea and tidal lagoons, from southern Somalia, through Kenya to southern Tanzania (Figure 3).

This species is closely related to E. schweinfurthianum, but is a much smaller shrub or tree with a different leaf shape, 4-merous flowers, 2-locular ovary, and smaller fruit. Robson et al. (1994) considered E. schweinfurthianum to be unisexual, but this needs confirmation in the field.
Selected specimens examined

Somalia: 01N44E: Brava [Barawa] (AA), Hildebrandt 1323 (BM, K).

Kenya:
- 01S40E: K7, Sabaki, 4 mile N of Malindi (AC), Polhill & Paulo 756 (K, PRE, UPS).
- 01S41E: K7, Lamu, Kui Isl. (CD), Rawlins, 134 (K); K7, Kiunga, near Italian border (DC), Dale 3528 (K).
- 01S42E: K7, Garsen Wittu road, 12.5 km towards Wittu from Garsen ferry crossing. (AC), Faden & Faden 74/1067 (K, PRE); Lamu Isl. Mznazi Moji (BD), Greenway 8898 (K).
- 01S43E: K7, Arabuko-Sokoke Forest, N of Sokoke forest station (BD), Musiyok & Hansen 1020 (C, K); K7, Kilifi (DB), Simpson 36 (K).
- 01S40E: K7, Gede Forest, Gedi National Monument (AC), Gerhardt & Steiner 157 (UPS).
- 01S39E: K7, Shamba Hills, forest station (AB), Magogo & Glover 1133 (K); K7, Likoni, S of Mombasa (AC), Baagoe, Danselien & Vollesen 20 (C); K7, Kiloni, near Kikoni (AD), Makin 423 (K); K7, Mombasa (BA), Wakefield 2193 (BM).
- 01S38E: K7, Kwaile, Diani Forest (BC), Gillet & Kihimba 19871 (K, MO, P, UPS); K7, Nga, Ngora (CA), Graham 2193 (BM).

Tanzania:
- 01S39E: T3, Moulini, sea level (BA), Faulkner 1867 (S).
- 01S39E: Zanzibar, Mazzini (AA), Faulkner 2283 (S); Zanzibar, Rash Fumba [Fumba], Shamba arca (AD), Frazier 2300 (MO); T6, Kunduchi (CA), Harris 4918 (MO); T6, Miasani (CA), Vaughan 2709 (BM).
- 01S38E: T8, Kingupira Forest, ground-water forest (BC), Vollesen 2399 (C).

3. Eiaedendron aquifolium (Fiori) Chiov., Flora Somali 1: 125, 147, fig. 1. (1929); Chiov.: 133 (1932); Loes. 173 (1942); N. Robson: 344 (1989); Beentje: 337 (1994); N. Robson et al.: 32 (1994). Type: Somalia, Gezira, Lugh, Paoli 1007 (FI, lecto, designated by Robson (1989); K, photo!).

Cassine aquifolia Fiori: 50 (1915) as aquifolium; Chiov.: 51 (1916); Dale & Greenway: 133 (1961).

Hartogia agrifolia Chiov.: 125 (1929), as agrifolium; Loes.: 180 (1942). Type: Somalia, Obbia between Scemarca Hassan and Tobunjub, Puccianii & Stehpanius 643 (FI, holo).

Eiaedendron papillosum none Hocht.: Brenan & Greenway: 123 (1949).

Icones: Chiov. 47, t.1, photo. (1929).

Selected specimens examined

Somalia:
- 01N44E: Plateau, NW of Gawn village (CB), Gillett, Homoing & Watson 22272 (K).
- 01N45E: Near Bardale, 68 mile SE of Lugh Ferrandi (AC), Rolly 9327 (K).
- 01N44E: Bur Heybe (AB), Brien 104 (K).
- 01N45E: Hiraan, 2.5-3 km NE of turning to Jalalasiq on Buuro Barde road (BC), Thulin & Abdi Doibe 6403 (K, UPS).
- 01N42E: Bay Region, 0215N 4248 (BD), Beckett & White 1576 (K); 73 km N of Bardera on road to Garba Harre (CD), Gillet, Homming & Greenway 2766 (K).
- 01N45E: Coast rd, 28 km NE of Mogadishu (CB), Gillet, Homoing & Greenway 24435 (K).
- 01N42E: Hombyo, 1 km W of Bagdad (BC), Madany 89/5 (UPS).
- 01S41E: S Somalia, 46 Km N of bend in Border, Gillet, Homming, Watson & Julian 25234 (K).

Ethiopia:
- 01N41E: Sidamo, 20 km N of Boikol Mayo on road to Filtu (CB), Gilbert, Scsbe & Vollesen 8208 (C, K, UPS).

Kenya:
- 01S39E: K7, Voi, Tsavo National Park, Gate Sala (AA), Greenway & Kanuri 12940 (K).

4. Eiaedendron buchananii (Loes.) Loes. in Natürllichen Pflanzenfamilien III, 5, Nachtr. 223 (1897); Loes. & Eng.: 223 (1921); Eggerling: 41 (1940); 79 (1952); Barter & Hoyle: 27 (1936); 40 (1958); N. Robson: 388 (1966); 344 (1989); Mendoça & Sousa: 183 (1968); Verdecour & Trump: 100 (1969); Villiers: 7 (1975); Noad & Binnie: 73 (1989); Beentje: 337 (1994); N. Robson et al.: 32 (1994). Type: Nyassaland [Malawi], without locality, Buchanan 7106 (B, holo; BM, KI).

Cassine buchananii Loes.: 551 (1893); 247 (1895b); Keay & Blakelock: 626 (1958); Wilczek: 130 (1960); Dale & Greenway: 133 (1961); Irvine: 453 (1961); White: 216 (1962); Boughley: 163 (1964).

Eiaedendron afzelii Loes.: 157 (1900); 174 (1942a); Hutchinson & Dalziel: 445 (1927). Type: Sierra Leone, Afzelius (B, holo; UPS).

Eiaedendron warneckeii Loes.: 309 (1908); 174 (1942a); Exell & Mendoça: 11 (1954); Types: Togo, near Lomé, Warnecke 45 (B, lecto, designated by Roson et al. 1994; BM, EA, K, PI).

Eiaedendron keniensis Loes.: 489 (1926); Eggerling: 79 (1952), as nr. E. keniensis. Type: Kenya, near Nyeri, Fries & Fries 206 (B, holo; K, UPS).

Eiaedendron friesianum Loes.: 490 (1926); 174 (1942a). Type: Kenya, near Meru [Mt. Aberdare], Fries & Fries 1731 (B,
Elaeodendron stomii Loes.: 35 (1934); Brenan & Greenway: 123 (1949). Type: Tanganyika, Rungwe Distr. near Ulamba, Stolz 2250 (Fl. holotype; BM, C, MO, PI, PREI, S, SAM, UPS).

Elaeodendron glauconium Pers. var. kamerunense Loes.: 35 (1934); 173 (1942a). Cassine glauca (Pers.) Kunze var. kamerunensis (Loes.) Wilczek: 131 (1960). Elaeodendron kamerunense (Loes.) Villiers: 10 (1975). Type: Democratic Republic of Congo [Zaire], Lake Albert, Nioka, Gomez 3 (BR, neotype, designated by Villiers: 10 (1975).

Elaeodendron sp. sensu Battiscombe: 91 (1936).

Elaeodendron albivenosum Chiov.: 132 (1932). Cassine albivenosa (Chiov.) Cuf.: 482 (1958). Type: Somalia, Jak Ominso, Semni 275 (Fl. holotype).

Elaeodendron sp. sensu Eegling: 80 (1952).

Icones: Robson: 389, t. 82 B (1966); Verdcourt & Trump: 101 (1969); Villiers: 9, t. 2; 11, t. 3 (1975): Noad & Birnie: 74 (1989); Beentje: 337 (1994); Robson et al.: 30, Fig 7, 4–7 (1994).

Shrub or tree up to 30 m tall; bark greyish to dark grey, smooth with powdery yellow pigment not observed. Branchlets subangular, greyish, lenticels prominent. Whitish. Leaves opposite to subopposite; lamina elliptic or slightly obovate, pale green to greyish above, greyish below. (30–) 50–75 × (125–) 30–50 (–75) mm, base rounded to attenuate. Apex obtuse to rounded or acute, margin glandular, punctate, 5–15 crenations on each side; coriaceous; venation prochloidiomeous. ± raised on both sides in dried material, fine reticulation less conspicuous; petiole 5–12 mm long; stipules greyish. Inflorescences axillary or in axils of bracts on specialized shoots, pedunculate, ± regular dichasial, 50 mm long, forming a paniculate inflorescence, 15–40-flowered, peduncle 10–18 mm long; bracts minute. Flowers unisexual, with petaloid staminodes in female flowers, 5-meros, 3–4 mm diam., pedicels 2 mm long. Sepals greenish, membranous, ± 1.0 × 1.0 mm, circular to depressed ovate, apex rounded, margin entire. Petals cream or greenish, ovate, 1.6 × 1.0 mm, margin entire, apex rounded, spreading. Stamens of male flowers ± erect; filaments 1.2 mm long, inserted below margin of disc, anthers 0.5 mm long, dorsifixed, introrse; staminodes of female flowers usually petaloid, slightly smaller and similar in shape to petals. Disc subentire with shallow sinuses at the point of stamen insertion, convex in female flowers, flat in male flowers. Ovary 2- or 3-(4)-locular, style 0.5 mm long, stigma entire or inconnisporously lobed, absent in male flowers. Fruit drupaceous, widely ellipsoid, cream or yellow, 20–25 × 15–20 mm, stone ellipsoid, tapered at both ends, endocarp 2–3 mm thick. Seeds 1 or 2, brown, ellipsoid and flattened on one side, 12 × 5 × 2 mm, embryo with fleshy cotyledons.

Elaeodendron buchanani occurs in evergreen and riverine forest, deciduous woodland, grassland as well as on termite mounds. The most widespread of the African species of Elaeodendron, it occurs in most countries from west to east in Central Africa (Figure 4). This wide distribution perhaps accounts for the many synonyms recorded. Easily recognized in Elaeodendron by its dioecious flowers with petaloid staminodes, a character shared with the Central American E. xylocarump (Vent.) DC.

E. buchanani is very common in parts of Uganda where it is a possible source of timber production. The wood is fine-textured and hard, but can be worked to a smooth surface (Dale & Greenway 1961). Dale and Greenway (1961) and Verdcourt and Trump (1969) also reported it as being extremely poisonous to livestock. Verdcourt and Trump (1969) mentioned that in grassland the species is often small and shrubby within reach of stock with fatal results; however, it is frequently browsed by giraffe.

Elaeodendron kamerunense may well be regarded as a good

species differing from E. buchanani in its bisexual flowers, inflorescences less dense and leaves not coriaceous (Villiers 1975). No material of the species was studied here. Villiers studied material of the neotype only, since the original material was apparently destroyed in B. More material and fieldwork are needed to evaluate the differences between the two taxa. The selected neotype from Lake Albert, Congo [Zaire], is possibly suspect since it is collected quite far from the original localities in Cameroon cited by Loesener (1934).

Selected specimens examined

Sudan

-7N27E: R. Numatimna (BA), Turner 102 (K).

Ethiopia

-7N35E: Ilhabor, 3 km s of Tepi (AB), Friis, Gilbert & Vollesen 4142 (C, K, UPS).

-7N36E: Wush plantation, 22 km W of Ongol (AC), Meyer 9075 (K); Gobeg River, N of bridge on Jimma-Bongo rd (AD), Friis, 2339 (K).

-9N38E: Mt Entoto, about 5 Km N of Addis Ababa (BB), De Wilde & De Wilde-Dyffes 8252 (C, P).

Ghana

-7N2W: Hani near Nsawkaw (CD), Hall & Lock 43919 (K, MO).

Togo

-6N01E: Lomé (CA), Warnecke 45 (BM, K, P).

Nigeria

-6N11E: Mambilla plateau, banks of river at Mayo Selbe (CB), Chapman 2753 (K).

Central African Republic

-4N17E: Bangui (CA), Guigonis & Normand 450 (K, P).
Cameroon

-01S30E: Houndi, Bertoua (-DA), Letoezey 2659 (K, P).

Democratic Republic of Congo [Zaire]

-0129E: Dr. Baka, Bongara 2891 (K).
-0236E: Katanga (-BC), Nqungobe 119 (K).
-0745E: Ganza, Kamundula (Parc National de l’U’penba) (-AD), De Wine 6514 (C, K).

Uganda

-04N32E: Imatongs (-BB), Eggeling 3555 (K).
-03N31E: King River, Rumogoi (-BC), Eggeling 1827 (K); Amua West, Madi (-DB), Eggeling 1808 (K).
-03N31E: Mountain Forest above Lututuru, Chua (-DB), Eggeling 3495 (K).
-05N31E: Luka Local Forest reserve, Ajiita (-CC), Oboua (K).
-03N31E: Serere(-). Teso (-DA), Chandler 1102 (K).
-03N31E: U3, Siti River, Kyesowenji (-BC), Eggeling 5731 (K).
-03N30E: U2, Kimbale Forest, Fort Portal (-CB), Clutton-Brock 5015 (K).
-03N31E: Miluzizi, Lake Albert (-CD), Bagshave 1320 (BM).
-03N31E: U4, Malwa, Forest Path (-CA), Dimmer 4425 (BM, P).
-05S30E: Kigunga Hill, Rungan, (-DC), Eggeling 6433 (K).
-05S31E: U4, Buddu (-BC), Dowe 977 (K).

Kenya

-04N33E: K5, Port Victoria, 200 yards from lake (-BB), Glasgow 4534 (K).
-03N34E: K3, SE Mt Elgon (-BA), Jackson, com. Lugard 3184 (K, PRE).
-03N37E: K4, Meru, Lower Imeni Forest (-BB), Vercourt & Polhill 2983 (K, PRE).
-05S35E: K5, Aititu Sotik (-CA), Dale 1015 (K, P, PRE).
-05S36E: K3, Mt Aberdare (-BC), Fries & Fries 1721 (K, UPS); K3, Mt Margaret (-DC), Bally 1159 (K).
-01534E: K6, 3 mile E of Lolgorian, Masai area (-BB), Edwards 3210 (K).
-01535E: K6, Mara Masai Reserve, Egerok [Keekorok] Forest (-BC), Bally 5444 (C, K).
-01535E: K4, Muguga (-BA), Kirka 507 (K, PRE); K4, Muguthi, Stream (-BC), Rogers 543 (K, S); K4, Nairobi, High Ridge Golf Course (-BD), Bally 102 (BM, K).
-01537E: Thika Falls (-AA), Pole Evans & Evans 1163 (K, P, PRE); K4, Mua Hills (-AC), Homing 231 (K); Mutanga (-BC), Baitlson 642 (K).
-02537E: Emali Hill (-AB), Van Sonen 198 (K).

Tanzania

-01S31E: Minzoro Forest Reserve, Bukoba Distr. (-BA), Procter 928 (K).
-01534E: Serengeti. Kogateu[ndr]-Nyambiri (-DB), Herkotter 664 (K).
-01535E: T1, Klein’s Camp, Coliondo (-CA), Tanner 1834 (K).
-02537E: T2, Ketoebelion, OlMolog, West Kilimanjaro (-CC), Freybug Elai510 (K).
-03S37E: Moshi Distr., Mt Kilimanjaro (-AD), Hughes 222 (K).
-05S56E: T5, Mpwapwa Distr., Ngomt M.F.R. (-DD), Raffo 1462 (K).
-06S30E: T4, Mwesi, Mpenda Distr. (-AB), Procter 1899 (K).
-08S53E: T7, Iruiga, Ngwazi (-CB), Lovett & Lovett 698 (MO, PREF).
-08S53E: T8, Selous Game reserve, Kingupira (-BC), Vollesen 2790 (C, K).

Angola

-09S14E: Malange (L-DE), Goswelder 1412 (BM, K, P).
-14S13E: Serra E Chela, Ualha, Vila Artiaga (-CD), Goswelder 12994 (BM, MO).

Zambia

-08S31E: River Kalamba, just above Falls (-CA), Brennan & Greenway 8179 (K).
-10S32E: I,osa (-BB), Fawcuth 7204 (K).
-12S36E: Mulufira (-CA), Fawcuth 1531 (K).
-12S36E: Kitwe (-CC), Fawcuth 1490 (K); Ndola Botanical [Forest] Reserve (-DC), White 31968 (K).
-13S34E: Luanshaya (-AB), Fawcuth 1403 (K); Ndola Distr., Mpongwe (-AC), Grant 2549 (K).
-14S24E: Mankoya (-DD), Fawcuth 8990 (K).

Malawi

-09S33: Chendo River, between Fort Hill and Chisenga (-CA), Robson 555 (BM, K, PRE).
-10S33: Chitipa Dist., lower Monde River (-BD), Brummitt & Shannon WC231 (K).
-14S34: Dedza mountain forest (-AD), Bandu 476 (BM, SRGH).
-15S53: Zomba, Mltita tobacco estate, Thundu (-AC), Chapman & Patel 5883 (K); Zomba, c. 1 km upstream from the Mlunungu bridge on Old Naisi road (-AD), Chapman, Patel & Balaka 6425 (K).

5. Elaeodendron schlechterianum (Loes.) Loes. in Natürlichen Pflanzenfamilien III, 5, Nachtr. 1: 223 (1897); 173 (1942a); N. Robson: 387 (1966); N. Robson & Sousa: 35 (1969); Beentje: 337 (1994); N. Robson et al.: 29 (1994). Type: Mozambique, Tete, Boruma, Menshart 2a (Z, hol.).

Cassine schlechteriana Loes.: 432 (1896); Schinz: 60[426] (1905); 314 (1926); Coates Palgrave: 513 (1977).

Cassine lacunata Loes.: 432 (1896); Schinz: 60[426] (1905); 314 (1936). Type: Mozambique, Tete, Boruma, Menshart 2a (Z, hol.).

Elaeodendron stuhlmannii Loes.: 156 (1900); Loes. & Engl.: 233 (1921); Loes.: 174 (1942a); Brennan & Greenway: 124 (1949).Synopsis: Tanzania, ‘Zanzibarküste: Usamara, Kidenga’, Stuhlmann 6326 (B); ‘Station N’honge in NW-Usamara im Walde bei Denga’, Stuhlmann 6332 (B).

Elaeodendron bussei Loes.: 41: 309 (1908); Loes. & Engl.: 233 (1921); Brennan & Greenway: 123 (1949).Type: Tanzania, Lindf., Busse 2412 (B, hol.); EA.

Elaeodendron papillatum sensu Brennan & Greenway: 123 (1949), non Hochst.

Elaeodendron capense sensu Burtt Davy & Hoyle: 37 (1936); 40 (1958) non Eckl. & Zeyh.

Elaeodendron capense sensu Burtt Davy & Hoyle: 37 (1936); 40 (1958) non Eckl. & Zeyh.

Shrub or tree up to 18 m tall; bark greyish brown, smooth or finely reticulate with yellow pigment not observed. Branchlets subangular to terete, grey to brown, leathery prominent, grey. Leaves opposite or subopposite; lamina elliptic to broadly obovate, greyish green, often glossy above, pale green below. 15-25 x 100-130 x (10-) 15-35 x (-80) mm, base attenuate, apex retuse, occasionally rounded or cleft, margin entire or glandular-denticulate to coriaceous; venation brochidodromous to semi-tr觇odromous, ± raised on both surfaces in dried material. Fine reticulation less conspicuous; petiole 4-10 mm long; stipules greyish. Fluorescences axillary, pedunculate, ± compact dichasial, (13-
Selected specimens examined

Kenya
-0138: Molujjtoni Hill (-DO), Bahi 1581 (K).
-0140: Lunghi Forest Reserve (Proposed), 23 km E of Bodheji (-DD), Luke & Robertson 1538 (K).
-0240: K7, Tana River, Garsen to Witu (-AD), Luke & Robertson 1265 (K).

Tanzania
-0233: T1, Mkalam, Summit of Iramba Scarp, above Sekenke (-AB), Burt 3372 (K).
-0333: T1, Shinyanga (-CB), Burt 5567 (BM, K, P).
-0435: [Name] and Distr., Bubu valley (-AB), Burt 819 (BM, K).
-0438: T3, Lushoto Distr., West Usambara Mts, Baga I Forest Reserve (-CD), Borhidi, Meirag & Pocs 84451 (UPS).
-0537: T2, Handeni Distr., Mboga wa Masas near Losikiti [ok] Mtn (-AD), Burt 4909 (K).
-0539: T3, Tanga prov, 8 mile NW of Tanga (-AA), Ferssue & Kiduba 8492 (K, UPS).
-0636: T5, Mpwapwa (-AD), Horsby 44 (K).
-0638: T6, Mandera (-AB), Saeleus 976 (P); T6, Bagan[no]yio (-BD), Kirk 2771 (K).
-0639: T6, Pugu Hills (-CC), Hawthorne 1744 (K).
-0838: T8, Kingupira, Selous Game Reserve (-BC), Ludanga 1344 (C, K); T8, Kingupira Forest (-DA), Vollesen 2743 (C, K).

Zambia
-0931: Abercorn, Chinakíla (-AC), Kafufi 192 (SRGH).
-1530: Katundwe (-AD), Favour 8122 (K).
-1627: Highlands of Batoka Country (-CD), Kirk, Jul 1860 (K).

Malawi
-1435: Zomba, Lwonde National Park (-CD), Dudley s.n. (SRGH).
-1634: Chickwawa, Lwonde Game Reserve (-CD), Hall Martin 902 (K, PRE, SRGH).

Mozambique
-1038: Niassa, Palma (-CD), Barbosa 2143 (LISC).
-1140: Mecchanga farm, 5 km from Mocimboa da Praia (-AD), Gomes e Sousa 4696 (K, PRE).
-1532: Zambezi Valley, near Chicoa, 30 miles above Tete (-CB), Hornby 2745 (K, PRE, SRGH).
-1536: Zambezia, Molumbo (-CB), Phillips 2770 (SRGH).
-1634: Manica and Sofala, Tambara [Nachaco] (-CA), Bond J10 (SRGH).
-1637: Zambezia, Ilé entre Ilé e Mugeba (-CA), Torre 5506 (LISC, SRGH).
-1734: Tete, Sinjal (-BB), Barbosa & Carvalho 3762 (K).
-1737: Maganja da Costa (-BC), Torre & Correia 14125 (LISC).
-1834: Beira, Gorongosa National Park, road 3, near saline areas (-DC), Tinley 1927 (B, K, LISC, P, PRE, SRGH).
-1935: Chinizu (-BA), Gomes e Sousa 4435 (K, PRE).
-2033: Buzi, Mucheve (-DB), De Carvalho 748 (K).
-2135: Bazaruto Island, Ponte Gengreame (-CB), Mogg 28740 (SRGH).
-2231: Guija, Malamia (-BA), Barbosa & Lemos 8170 (K, LISC, SRGH).
-2432: Gaza, de Esivane para a Aldeia da Barragem, a 10 km da Aldeia da Barragem (-BA), Barbosa & de Lemos 8215 (K); Guija, de Motase (-DD), Mendonça 2774 (K, LISC, PRE).
-2433: Caxiá (Chamusca) (-AC), Torre 7876 (B, Z); Macia, Muianha [Mananga] (-CA), Pedroga 1448 (K, PRE, SRGH);
Bilene, c. 1 km depeis do Licile (-CD), Lemos & Balsinhas 54 (BM, K, LISC, PRE, SRGH).
-2532: Magude, Chobela (-BA), Torre 7054 (LISC).
-2533: Gaza, ao 6 km da Praia Chongonho para a praiia Sepulveda (-BB), Correia & Marques 1476 (PRE, SRGH).
-2632: Inhaca Island, Hanganyani Hill (-BB), Mogg 27614 (I); Maputu, andades 6 km da Ponta do Cears [Ouro] (-DD), Correia & Marques 2965 (SRGH).

Figure 5 Known distribution of Elaeodendron schlechterianum.
6. Elaeodendron matabelicum Loes. in Botanische Jahrbücher 40: 61 (1907); 174 (1942a); Eyles: 404 (1916); N. Robson: 385 (1966); N. Robson & Sousa: 34 (1969). Type: 'Rhodesia, Matabeland, Baumsteppe bei Matopos in etwa 1600 m, September', Engler 2835 (B†). Neotype: Matobo, Farm Besna Kohila, Miller 8290 (K!, neotype, here designated: PRE!, SRGH).

Cassine matabelica (Loes.) Steedman: 41 (1933); Coates Palgrave 511 (1977). Elaeodendron capense sensu Miller: 48 (1952).

Cassine sp. 1. White: 216 (1962).

Elaeodendron fruticosum N. Robson: 39 (1965); 386 (1966); N. Robson & Sousa: 34 (1969). Type: Mozambique, Gaza, Vila de Joao Belo beach, Torre 3878 (LISC!, holotype, SRGH!)

A wide distribution in the drier deciduous woodland regions of Angola, Zambia, Zimbabwe and Mozambique (Figure 3). It is particularly plentiful near Bulawayo and in the Rhodes Matopos National Park, Zimbabwe. Unlike other widespread species of African Elaeodendron, few synonyms exist for this relatively homogeneous species.

Robson (1965) distinguished E. fruticosum from E. matabelicum on the basis of 'habit, fruit colour, and the size and number of flowers'. Robson based his observations of flowers on the type specimen, the only flowering collection available to him. Flowers of additional specimens have now been examined and are at least identical to those of E. matabelicum. The reported orange colour of the fruit (Robson 1965, 1966), instead of white or cream as in other species of Elaeodendron, is doubtful. Fruit of Torre 6717, cited by Robson (1965) was described as 'esbranquiçadas' (=whitish). In two additional specimens cited by Robson (1965), Gomes & Sousa 1828 & 1871, the original Portuguese labels were replaced by new labels in French. It is likely the colour of fruit was incorrectly translated or that the colour of dried fruit, brown or reddish brown, was noted. It seems thus likely that E. fruticosum is merely a local variant of E. matabelicum. There is a need for more fieldwork on the taxon in Mozambique.

E. matabelicum is possibly the species of Elaeodendron referred to in Watt and Breyer-Brandwijk (1962) involved in 'trials of ordeal' in Zimbabwe. It is also used as an aphrodisiac, for abdominal and chest pains, menstruation and diarrhoea in Zimbabwe (Gelfand et al. 1985).

Selected specimens examined

Zambia

—1230: Kasanka National Park (-CA), Harder et al. 1998 (MO, PRE).

—1331: Luangwa Valley, Mfuwe (-BB), Astle 4871 (SRGH).

—1628: Siambamo Forest Reserve (-CB), White 3014 (BM, PRE).

—1727: Mazabuka, Mochipapa Agricultural Station. (-CC), White 6230 (SRGH).

Malawi

—1333: Dowa, Lake Nyasa Hotel (-DB), Chase 3881 (BM, MO, PRE, SRGH, UPS).

—1334: Cape Maclear, Nkhuwungi Hill, near the house (-DD), Patel 846 (SRGH).

—1434: Dedzi mountain forest (-AD), Bandi 476 (SRGH).

—1535: Zomba, 1 km upstream from the Mlungazi bridge (-AD), Chapman, Patel & Batsa 6245 (SRGH).

Mozambique

—1532: Cabo Bassa, Marâvia, arredores de Chicoa (-CB), Mendonça 478 (K, LISC, P, SRGH); Cabo Bassa, Magoé, 30 km para Chicoa (-DC), Torre & Correia 18260 (LISC, K).

—1734 (Chemb): Manica e Sofala, Maringue (-CD), Bond 964 (SRGH).

—1735: Zambezia Dist., Serra Morrumbala (-BC), Miller & Pepe 1986 (LISC, SRGH).

—1834 (Vila Paiva de Andrade): Manica e Sofala, Gorongosa National Park (-CD), Agustó Macedo 2237 (SRGH).

—1933 (Vila Pery): Chimoio, perto do rio Vunda (-AB), Andrade 1207 (LISC).

—2135 (Bazaruto): Magurisqua I. (-DC), Gomes e Sousa 1871 (K, COI).

—2235 (Mapinhane): Vilanculos (-AB), Barbera e Belinha 5017 (BM); Ponta [de] Barra Falsa (-DC), Magy 28929 (J. K, SRGH).

—2335 (Inhambane): Old Inhambane (Estevam), 24 km E of Inhambane (-DC), Gomes e Sousa 2023 (K).

—2434 (Panda): Jacobê (BB), Gomes e Sousa 1871 (K, COI, K).

—2533: Gaza, Vila de João Belo [Xai-Xai]-BA), Torre 3878 (LISC, SRGH); Gaza, Chongoné, a cerca de 1 km do hotel (-BB), Rodrigues, Pereira, Marques e Balintunas 247 (PRE, SRGH).

Zimbabwe

—1630: Lonangudzi, Dom Hill (-AB), Eyles 5703 (SRGH); Sipililo, Great Dyke, growing near Vei (-DA), Nyartiv 149 (SRGH).

—1729 (Copper Queen): Melsetter, Biriviré Reserve (-BC), Ball 17
Elaeodendron zeyheri is a relatively rare tree, only locally frequent in the Eastern Cape and some parts of KwaZulu-Natal. The known distribution in the Eastern Cape, KwaZulu-Natal and one locality in Mozambique near the Mvimulanga-SwaZiland border has been extended considerably by Mr. S. Venter who discovered several new records in the Northern Province (Figure 7). Though listed as indeterminate in Hall et al. (1980), under the name Cassine crocea auct., there appears to be no need for any conservation status at present. Flowering October to April. Fruiting December to June.

In the Eastern Cape and Northern Province bark is extensively collected for medicinal and magical purposes (Vernon 1994; personal observations).

Until recently, the names Crocoxylon croceum (Robson 1965, 1966) or Cassine crocea (Arnold & De Wet 1993) have been widely applied to this species. Ecklon and Zeyher were not only unaware of the true identity of Thunberg’s Ilex croceum when they published a taxonomic synonym, Elaeodendron capensis, in their Enumeratio Plantarum, but they also chose the superfluous name Crocoxylon excelsum as the new name for E. croceum, therefore the type of Crocoxylon Eckl. and Zeyh. is E. croceum. The generic description of Crocoxylon and the two specimens cited in the Enumeratio Plantarum, however, clearly refer to the present species. This confusion has been perpetuated by most subsequent authors, adding to the confusion by misconstruing the characters and distribution of the two species (e.g. Von Breitenbach 1965, Coates Palgrave 1977). Most information in literature referring to Cassine crocea (hitherto often incorrectly referred to as Cassine papillosa) is applicable to Elaeodendron zeyheri and not E. zeyheri.

Both manuscript names, Salacia zeyheri and Rhannus zeyheri were presumably provided on duplicate specimens of a collection of Zeyher. Inexplicably, Harvey (1860) described Salacia zeyheri with flowers 4-parted, but with ovary trilocular and with three stamens in the treatment of Hippocrateaceae in Flora Capensis. This observation was confirmed by Sonder (1860) in the treatment of Celastraceae in the same volume of Flora Capensis. This particular specimen could not be accounted for, and is possibly aberrant (as suggested by Sonder 1860)). Sonder placed E. zeyheri as C. [Cassine?] zeyheri Turcz. under an inclusive Elaeodendron croceum.

Robson (1965, 1966) considered E. zeyheri and E. transvaalense as being sufficiently distinct from Elaeodendron due to their flowers with isomerous ovaries and stamens situated inside the disk to justify the segregate genus Crocoxylon Eckl. and Zeyh. Leaf margins of E. zeyheri are glandular-denticulate, never spinulose-denticulate, a condition often very marked in juvenile leaves of Elaeodendron croceum.
Figure 6  *Elaeodendron zeyheri*. 1. Flowering branch. x1; 2. flower. x10; 3. fruit. x1; 4. & 5. seed. x1.5. Drawn by Anne Stadler from Story 1267 (PRE); 3–5. from Briars s.n. (PRU).
South Africa
— 2320 (Pietersburg): Soutpansberg. Vovo. Farm of Mr Maggs, behind house (–AB). Archer 482 (PRE); Houtboschdorp (–DD). Venters t.n. (PRE).
— 2430 (Pilgrim’s Rest): Olcolaco. rocky outcrop on river bank (–AB). Garlick 10 (PRE).
— 2731 (Louwswburg): Magut. 2 mile SW of Magut on W slopes of mountain (–DA). Acocks 1927 (K. PRE).
— 2732 (Ubonbo): False Bay Park (–CD). Nichols 795 (NH. PRE).
— 2830 (Dundee). Muden. Mook River (–CD). Watt & Brandwijk 1476 (PRE).
— 2831 (Kndaila): 10 mile W Nkandla in Nsuzu River Valley (–CA). Coetz 1421 (PRE); Mpfu Game Reserve (–CD). Macti PRE: 60785 (PRE).
— 2930 (Pietermaritzburg): Greytown to Mooi River. 18 km (–AA). White 10593 (NH. PRE); Tweedie. Ashley Grange (–CA). Moll 933 (K. NH. PRE); Cato Ridge (–DA). McClean & Ogilvie (NH. PRE).
— 3127 (Lady Freire): Elliot. Bloemvlei on mountain slope (–BD). Van Zinderen Bakker 66 (K. PRE).
— 3128 (Untata): Engcobo. All Saints Nek. 2.2 mile from Engcobo (–CA). Marais 503 (K. PRE).
— 3226 (Fort Beaufort): Pefferskop (–DB). Acocks 5899 (PRE); Koomap Heights (–DC). Bruten 2035 (GRA. PRE); Alice. Mavuso Location. between location and town of Alice (–DD). Gibbs-Russell 3929 (PRE).
— 3227 (Stutterheim): Fort Cunynghame (–AD). Sin 2120 (BOL. GRA. PRE); Stutterheim. 8.4 mile from Stutterheim on Keiskamma Hole road (–DB). Marais 528 (GRA. K. PRE); Woods near Komga (–DB). Flanagan 775 (GRA. PRE).
— 3324 (Siyetilleville): Beans Bush. Patensie (–DD). Baylas BRI.B 334 (PRE).
— 3325 (Port Elizabeth): David Birch. Farm Mimosa on Paterson Road to Addo (–BD). Rippon PRE: 64923 (PRE); Addo National Park. Zonekop (–DA). Hall-Martins 5959 (PRE).
— 3326 (Grahamstown): 19 mile from Fort Beaufort on Grahamstown road (–AA). Marais 529 (BOL. GRA. K. PRE); Farm Groot Tootaba (–AC). Archbold 5893 (GRA. PRE); Ecca River Valley. Glen Dew (–BA). Tayler & Edwards 5891 (GRA. K. PRE). Grahamstown. 6–16 km from Grahamstown along Manley flats turnoff on East London road (–BC). Jones PRE: 57729 (K. PRE); Bathurst. Hopewell (–BD). Acocks 12069 (PRE); Fonteinskloof. 27 km from Alexandria on road to PE (–CA). Barrows 2835 (GRA). Alexandria Forest (–CB). Marais 540 (GRA. K. PRE); 1 mile E of Kariega River. road Southwell-Alexandria (–DA). Acocks 12069 (GRA. PRE); Bathurst State Forest. Waters Meeting Nature Reserve (–DB). Henman 865 (PRE).
— 3327 (Poddle): East London (–BB). Irving TRIV: 26234 (PRE).

8. Elaeodendron transvaalense (Burtt Davy) R.H. Archer. comb. nov. Type: Transvaal. Lydenburg Dist.; Sabie-hoek forest, Burtt Davy 1867 (PRE, holotype. BOL).

Salacia vs transvaalensis Burtt Davy: 51 (1921). Pseudocassine transvaalensis (Burtt Davy) Bredell: 330 (1937); Loes.: 230 (1942b); Miller: 35 (1948); Pardy: 631 (1956); Boughey: 164 (1964); Gomes e Sousa: 459 (1967); Coetzer: 338 (1976). Crocoxylon transvaalense (Burtt Davy) N. Robson: 41 (1965); 391 (1966); N. Robson & Sousa: 173 (1969); Mendonça & Sousa: 183 (1968); Roessler: 2 (1968). Cassine transvaalensis (Burtt Davy) Codd: 124 (1966); Palmer & Pitman: 1322 (1973); Van Wyk: 347 (1974); 147 (1984); Coates Palgrave: 513 (1977); Drummond: 128 (1981); Arnold & DE Wet: 483 (1993); Pooley: 278 (1994).

Hippocratea Seiner: 44 (1911). nom. nud.

Elaeodendron croccum var. triandrum Dinter: 189 (1921). nom. nud.

Elaeodendron croccum (Thumb.) DC. var. heterophylla Loes.: 35 (1934). Type: Groothoef, Dinter 919 (SAM!, lectotype, here designated).

Icones: Robson: 392, t. 83 (1966); Gomes e Sousa: t. 128 (1967); Van Wyk: t. 416 (1974); 147 (1984); Drummond: 129, t. 60 (1981).

Irregular shrub to tall rounded bush or tree; bark greyish, yellow pigment absent or hardly visible, rhizome exfoliating in thin scales, surface deeply longitudinally fissured. Branchlets terete, greyish, lenticels inconspicuous. Leaves alternate, spiralled to clustered (fasciculate) or subopposite, often tennate at the apex; lamina elliptic to oblun to narrowly oblun, green to greyish green (10–15–40–90) x (5–7–15–25) mm, base cuneate. apex rounded; margin entire to glandular-dentate to spinose-dentate on juvenile shoots; coriaceous; venation indistinctly brochidodromous, ± raised above and below in dried material, furrow reticulation less conspicuous; petiole 2–5 mm long; stipules brownish black. Inflorescences axillary towards apices of branchlets, pedunculate, compact dichasial, 3–10–(15)–flowered, peduncle 4–10 mm long; bracts minute. Flowers bisexual, 3-merous, ± 6 mm in diam., pedicels 3–4 mm long. Sepals greenish, subcircumcise, 1.2 x 1.6 mm long, subcoriaceous, margin entire. Petals cream to green, oblong to obovate, 3–4 x 2.5 mm, sessile, spreading, apex rounded, margin entire, the lower half revolute, involute towards the apex (appearing spotulate), the lower half of the lamina thickened with projections towards the apex. Stamina initially erect, soon curving outwards with anthers almost touching sepals; filaments ± 1 mm long, arising from near centre of disc, anthers ± 0.4 mm long, exserte. Disc entire, convex, thick and fleshy. Ovary 3-locular; style ± 0.4 mm long, stigma inconspicuous. Fruit drupaceous, spheroid to widely ellipsoid, cream or yellowish, drying dark brown. 10–15 mm diam., stone spheroid to broadly elliptic, surface smooth, 8–12 mm diam.; endocarp 2 mm thick. Seeds 1 or 2(3) per fruit, seed-coat dark brown, ovoid, flattened, 8 x 5 x 2 mm; embryo ovate.

Elaeodendron transvaalense is widespread in southern Africa, being recorded from Zambibia, Zimbabwe, South Africa, Swaziland, Namibia, Botswana and Mozambique (Figure 8) where it occurs in woodlands and bushveld, occasionally growing on termite mounds. In the KwaZulu-Natal bushveld it is particularly conspicuous. The Ingwavuma District in KwaZulu-Natal is named after the common Zulu name of the tree. Flowering

Figure 7 Known distribution of Elaeodendron ceyheri.
December to April.

The bark of *E. transvaalense* is used extensively in Zulu traditional medicine (Hutchings 1996). On the Witwatersrand it is among the more popular items in trade on muti markets (pers. comm. V. Williams, Department of Botany, University of the Witwatersrand). Palmer and Pitman (1973) provide a recipe, recounted by Father Gerstner, for a tea made of bark. 11, a peltogynous and three pentacyclic triterpenoids have been isolated from the bark (Drewes et al. 1991).

*Elaeodendron transvaalense* was placed in many genera, amongst others a genus of its own (*Pseudocassine* Bredenkamp 1937). On account of its 3-merous flowers, unusual in the family Celastraceae, Loesener (1942b) placed this species as *Pseudocassine*.

Selected specimens examined

**Angola**

- 1513: Huila, Chibota, Tchivinguio (-AB), Gossweiler 12715 (BM, MO); Huila (-BA), Dekindi 604 (P); Huila, Quinhia, margens do Rio Caculuvu (-BD), Barbosa & Moreno 10174 (PRE).

**Zambia**

- 1725: King's Mile, Livingstone (-DB), Brenan & Greenway 7790 (K).

- 1726: Hunter's Rest Farm, on rd 347 (to Kabanga Mission) on Nuruwamba stream (-BA), Bainbridge 926 (K).

**Zimbabwe**

- 1826 (Hwange): Main Camp, near Dopi, Wankie National Park (-DD), Rushworth 1330 (K, PRE, SRGH).
- 1830 (Hartley): Hartley, Poole Farm (-AB), Hornby 3382 (K, SRGH).
- 1832 (Mukate): Rusype, Valhalla (-CB), Dehn R8 (K); Umtilali, Commonounge (-DC), Chase 3928 (BM, K, PRE, SRGH).
- 1929 (Gweru): Gwelo, 6 mile S of Gwelo (-BD), Biegel 1952 (K, PRE, SRGH).
- 1930 (Mvuma): 2 mile from Lalapanzi on Gwelo road (-AC), Mullin 11/51 (MO); Umvuma Golf Course (-BC), Hodgson 3550 (K, PRE, SRGH); Schukwe, Gwennor Dam near spillway, south end (-CA), Biegel 2602 (K, SRGH).
- 2028 (Bulawayo): Bulawayo Hillside (-BA), Hodgson 5/52 (K, PRE, SRGH); Eveso Vale (-BD), Borsi 87 (K, PRE); Matopos (-DA), Weat 872 (K, MO, PRE, SRGH).
- 2030 (Masvingo): [Fort] Victoria [Masvingo] (-BD), Monro 588 (BM, K).
- 2130 (Nuanetsi): Nuanetsi, Matifi Reserve, Paniha Weir Sandveld (-BC), Davies 2433 (K, MO, PRE, SRGH).
- 2132 (Massangena): Lundi area (-AC), Mullin 98/31 (K, MO, SRGH).

**Namibia**

- 1714 (Ruacana Falls): Ruacana (-AC), Kotze 15 (PRE).
- 1725 (Livingstone): Kazungula (-CC), Van Rensburg 10486 (PRE).
- 1814 (Ojouenda): Xaoekoveld, Farm Ojitutundua (-CA), Giess & Leipert 7346 (MO, PRE).
- 1817 (Tsintsabis): Tsumeb, Tsintsabis (-DB), Marsh PRE-47212 (PRE).
- 1917 (Tsumeb): Grootfontein, Farm Heidelberg (-BB), Walters 365 (B, PRE); Farm Kankaus, road to Post Office (-CA), Kinges 3016 (PRE).
- 1918 (Grootfontein): ± 80 km from Rundu, Farm Tararanka (-BA), Bourgogne 3229 (PRE); Grootfontein, Venters Post (-CA), Dinter 7398 (BM, POL, K, PRE, Z).
- 1920 (Tsumkwe): Tsukmwe, Groot Dobe (-BC), Boitka & Bredenkamp 3592 (PRE); Barkapans-Wes (-DB), Botka & Bredenkamp 3602 (PRE); 13 km E of Tsukmwe (-DC); Giess, Watt & Soymian 11088 (PRE).

**Botswana**

- 1821: (Andara): 25 km S of Skhawae Fishing Camp (-DB), Ven­ter, Hahn & Archer 75 (PRE).
- 1822: (Kangara): Okavango River, 16 km S of Samocma camp site (-CA), Muller & Biegel 2292 (MO, PRE); Guma Lediba, W end near harbour (-CD), Smith 1576 (K, MO, PRE).
- 1823: (Siamabisso): Kwando River (-BC), Smith 2343 (K, MO, PRE).
- 1824 (Kachikau): Serondela, Chobe River Bank (-BC), Miller B/1131 (PRE).
- 1922 (Nkonang): "Blochage" Island Camp (-AB), Smith 194 (K, LISC, PRE); Gomare, Toachi River Bank (-AC), Errens 255 (K, PRE); Mokolane, Central Thoage (-CB), Smith 1488 (K, PRE).
- 2022 (Lake Ngami): Tsau, 13 km N of Tsau alongside Tsaun Nakaneng, River route (-BA), Smith 1456 (K, MO, PRE).
- 2023 (Gwende Hills): Maun (-AB), Smith 1234 (K, MO, PRE); Botletile River, 1 km E of Samadupe Drift (-BA), Biegel & Russell 3736 (LISC, MO, PRE, S).
- 2024 (Shua Hills): Botletile River (CD), Errens 209 (K, PRE).
- 2124 (Bobuli): Toromojoa, (BA), Ngomi 425 (B, K, MO, PRE); Boteti River (-BA), Smith 2545 (K, PRE).
- 2226 (Sereow): Motsimeuse, Sereow (-BC), Miller B/224 (PRE).

**Mozambique**

- 2433 (Chibuto): Gaze, Canicado, andando 43 km de Mapulanga for Massingir (-AC), Correia & Marques 873 (LISC, PRE).
- 2532 (Maputo): Lourenco Marques, Magude (-BA), Torre 7295 (K, LISC); Lourenco Marques, Matola bridge (-CD), Bredenkamp LM56 (PRE); Maputo, Quinta da Pedra (-DC), Gomes & Sousa 3658 (K, MO, PRE).
- 2632 (Bela Vista): Lourenco Marques, Ambeluzi (-AB), Carvalho 998 (NBG); Maputo, near Chagulane (-AC), Torre 7926 (LISC); Lourenco Marques, near Porto Henrique (-BC), Balsinhas 508 (BM, K, LISC, PRE).

**Swaziland**

- 2631 (Mbabane): Tseaneti, SE side of town (-BA), Van Jaarsveld 984 (K, NBG, PRE); Mbuluzi Private Nature Reserve, Umblezi Estates S of Viti's compound (-BB), Culverwell 1347 (PRE): 5.5
mile NE of Npaka Station, near S end of Hlane Wildlife Sanctuary (–BD), Cuberwell 812 (PRE); 2, N of Ngwevheri River, 4 km SE of Gebeati Royal Kraal (–CB), Prior 298 (PRE); Tintumutini Hills (–DA), Kemp 1461 (PRE); S. Blue Jay Ranch (–BD), Conpton 32152 (PRE).

—2632 (Bela Vista): Farm Mlawula, 2.5 mile S of Mlawula Station, W of Nkumbe Stream (–AA), Cuberwell 836 (PRE).

South Africa

—2229 (Waterpoort): Foot of Wyllie’s Poort (–DD), Story 5953 (K, PRE).

—2230 (Messina): Mutale River, bridge to Masisi (–BD), Pienaar 1124 (PRE); Tete Vondo Forest Reserve, Dzanzani, Deepkloof (–CC), Henn 257 (J, PRE).

—2238 (Baltimore): Blauwberg, near Leipzig Mission Station (–BB), Smuts & Pole-Evans 831 (BOL, PRE).

—2329 (Pietersburg): Brakriver (–AA), Mara Research Station (PRE); 3 mile N of Bandoelierskop (–BD), De Winter & Killeen 8907 (PRE); 5 mile S of Turtjop (–DD), Thomas 58 (PRE).

—2330 (Taamzen): Ben Lavin Nature Reserve (–AA), Ben Lavin Grp 420 (AD); 25 km from Giyani on the way to Punda Milia (–BC), Van Wyk, Deltogae & Kon 5467 (C, PRE, PUL); Hans Merensky Nature Reserve, Black Hill Dam (–DA), Oates 2466 (PRE); Phalaborwa, Letaba Ranch (–DB), Swart 77 (PRU).

—2428 (Nylstroom): Melkriver, 11 km vanaf Vaalwater op pad na Melkriver (–AC), Coetzee 996 (K, PRE); Zebediela, Farm Wildbeestlaagte (–AD), Giffinnia sub Galpin 651 (PRE); Stepping Stones Farm, 26 mile NW of Naboornspruit (–BA), Mogg 37397 (PRE); Warmbaths (–CD), Balsinskas 3427 (BM, K, PRE); Naboornspruit, Mosdenie (–DA), Galpin 469M (BM, K, P, PRE).

—2429 (Zebediela): Swartkrans Area, Makapan’s Valley (–AA), Balsinlas & Balkwill 4419 (J); Sekhukuniland, Winterfeld Farm (–CA), Briers 42 (PRE); slopes between Magneethoogte and Schoonoord (–DD), Maaren 20 (PRE).

—2430 (Pilgrim’s Rest): Swatini Nature Reserve, near dam (–DB), Retief, Reynne, Couster & Reid 1140 (PRE).

—2431 (Acoeknook): Limbath Bushveld E of Klasiri (–CA), Shackleton 580 (J); Kruger National Park, 9 mile W of Skukuza (–DC), Codd & De Winter 3130 (K, PRE).

—2529 (Witbank): Loskop Dam (–AD), Mogg 30421 (J, K, PRE).

—2530 (Lydenburg): Lydenburg, Uitkyk farm (–AA), Van Grem & Students 677 (PRE, PRU).

—2531 (Komatiport): Kruger National Park, Shabin (–AA), Van der Schijff 702 (K, PRE); Kruger National Park, Nahpe (–AB), Van der Schijff 3875 (K, MO, PRE); Komatiport, Lekasi Bantouwts (–AC), Nel 382 (K, MO, PRE); Lebombo Mountains, Avondstone plains by Transvaalse grens tussen Komatiport en Squamans (–CA), Coetzee 1380 (K, MO, PRE); Kaap Muiden, Stentor (–CD), Nel 342 (NBG, PRE); Wilsopson, 8 mile SW of Hectorpruit (–DA), Builtsval 905 (PRE); Farm Castelloufouts between Komatiport and Squamans (–DA), Coetzee 1905 (PRE).

—2632 (Bela Vista): Nduumu, 2.5 km S of Nduumu store on Makane’s Drift road (–CD), Stephan 641 (K, MO, PRE).

—2732 (Umboho): Pongola Flood Plain (–AD), Moll 5132 (PRE); Umboho (–CA), Gerster 3777 (K, PRE); Makazinghi Flats (–CD), Herman 1022 (PRE).

—2829 (Harrellsmith): Van der Merwevskraal Farm, 9 mile E of Escom (–DD), Green 92 (PRE).

—2830 (Donde): c. 8 mile SE of Weenen (–CC), Aceoks 13662 (PRE); 4 mile from Mouden (–CD), Edwards 902 (PRE); Kranskop, 24 km from Kranskop on Nkandla road (–DD), Hildyard 116 (C, K, PRE).

—2831 (Nklandu): Mahlabatini (–AB), Gerster 4161 (BOL, GRA, K, PRE); 1 mile in Umfolozi Game Reserve toward Mplia woodland (–BB), Moll 5246 (PRE); Umfolozi Game Reserve (–BD), Bourquin 440 (PRE); Ian Scott-Barnes’ Farm (–DB), Moll 4559 (K, PRE).

—2832 (Mtubatuba): Hluhluwe Game Reserve (–AA), Stewart 280 (PRE).

—2931 (Stanger): Mapumulo, Oqaqueni (–AA), Edwards 1840 (K, PRE).

References

ARCHER, R.H. 1990. The taxonomic status of Cassine L. s.l. (Celastraceae) in southern Africa. M.Sc. Thesis, University of Pretoria, Pretoria.

ARCHER, R.H. & CONDY, G. 1995. Elaeodendron erucatum. Flower. Pl: Af 54: 58–62.

ARCHER, R.H. & VAN WYK, A.E. 1992. Palynology and intergeneric relationships in some southern African species of subfamily Cassinoideae (Celastraceae). Grana 31: 241–252.

ARCHER, R.H. & VAN WYK, A.E. 1993a. Bark structure and intergeneric relationships of some southern African Cassinoideae (Celastraceae). IAWA J. 14: 35–53.

ARCHER, R.H. & VAN WYK, A.E. 1993b. Wood structure and generic status of some southern African Cassinoideae (Celastraceae). IAWA J. 14: 373–389.

ARCHER, R.H. & VAN WYK, A.E. 1996a. Generic delimitation of subfamily Cassinoideae (Celastraceae) in Africa. In: The biodiversity of African plants, eds L.J.G. van der Maesen, X.M. van der Burg & J.M. Mecenedebagh de Rooy, pp. 459–463. Kluwer Academic Publishers, Dordrecht.

ARCHER, R.H. & VAN WYK, A.E. 1996b. Celastraceae: Correct orthography and author citation for Elaeodendron. Batalhia 26: 41–42.

ARNOLD, T.H. & DE WET, B.C. (eds). 1993. Plants of southern Africa: names and distribution. Mem. Bot. Surv. S. Afr. 62: 1–825.

BAKER, E.G. 1911. Contribution to the Flora of Gzazdak. Dictyodendron, Polyplectae. J. Linn. Soc. Bot.: 40: 16–76.

BATTISCOMBE, E. 1936. Trees and shrubs of Kenya colony, 2nd edn. Government printer, Nairobi.

BEENTJE, H.J. 1994. Kenya trees, shrubs and lianas. National Museums of Kenya, Nairobi.

BLAKELOCK, R.A. 1957. Notes on African Celastraceae. II. Kew Bull. 1956: 555–557.

BOUGHEY, A.S. 1964. A check list of the trees of southern Rhodesia. J. S. Afr. Bot. 30: 151–171.

BREDELL, H.C. 1937. Pseudocassina, a new genus of Celastraceae from South Africa. S. Afr. J. Sci. 33: 330–334.

BRENAN, J.P.M. & GREENWAY, P.J. 1949. Check-lists of the forest trees and shrubs of the British Empire. No. 5. Tanganyika Territory. Part 1. Imperial Forestry Institute, Oxford.

BURT DAVY, J. 1921. III. New or noteworthy South African plants. I. Bull. Misc. Inf Kew 1921: 49–52.

BURT DAVY, J. & HOYLE, A.C.1936. Checklist of the forest trees and shrubs of the Nyassaland Protectorate. Revised by P. Topham, 1958. Government Printer, Zomba.

CHOYVENDA, E. 1816. Le collezioni Botaniche della Missione Stefani-Pasoli nella Somalia italiana. Vol. 1. Cucci, Firenze.

CHOYVENDA, E. 1929. Celastraceae. In: Flora Somala I, ed. E. Chiovenda, pp. 125–127. Sindicato Italiano, Roma.

CHOYVENDA, E. 1932. Celastraceae. In: Flora Somala II, ed. E. Chiovenda, pp. 132–134. Modena R. Orto Botanico, Roma.

COATES PALGRAVE, K. 1977. Trees of Southern Africa. 1995 impression. Struik, Cape Town.

COATES PALGRAVE, K., COATES PALGRAVE, P. & COATES PALGRAVE, M. 1985. Everyone’s guide to trees of South Africa. CNA, Johannesburg.

COOKE, L.E. 1966. Celastraceae. The Cassine complex. In: New and interesting records of African flowering plants. Botalhia 9: 123–151.

CUMPTON, R.H. 1976. The Flora of Swaziland. J. S. Afr. Bot. Suppl. Vol. 11.

CUFODONTIS, G. 1958. Enumeratio euripediae Spermatophyta. Bull. Nord Bot. East. Brussels 28, Suppl.: 441–488.

DALE, T.R. & GREENWAY, P.J. 1961. Kenya trees & shrubs. Buchanan’s Kenya Estates, Nairobi, in association with Hatchards, London.
[Leipzig].
ROBSON, N.K.B. 1965. New and little known species from the Flora Zambesiaca area XVI. Taxonomic and nomenclatural notes on Celastraceae. Bolm. Soc. Broteriana 39 (2. ser.): 5–55.
ROBSON, N.K.B. 1966. Celastraceae (incl. Hippocrales). In: Flora Zambesiaca, eds A.W. Exell, A. Fernandes & H. Wild, Vol. 2(2), pp. 355–418. Crown Agents for Overseas Governments and Administrations, London.
ROBSON, N.K.B. 1989. Celastraceae. In: Flora Aethiopica, eds I. Hedberg & S. Edwards. Vol. 3, pp. 331–347. Addis Ababa & Uppsala.
ROBSON, N.K.B. & SOUSA, E.P. 1989. Celastraceae. In: Flora de Moçambique, Vol. 48(1): 1–66. Centro de botânica, Lisbon.
ROBSON, N.K.B., HALLE, N., MATTHEWS, B. & BLAKELOCK, R. 1994. Celastraceae. In: Flora of Tropical East Africa, ed. R.M. Polhill, pp. 1–78. Balkema, Rotterdam.
ROESLER, H. 1968. Celastraceae. In: Prodromus einer flora von Süddeutschland und dem westlichen Italien, ed. H. Merxmüller, 77: 1–6. J. Cramer, Lehre.
ROXBURGH, W. 1814. Hortus Bengalensis. Mission Press, Serampore.
ROXBURGH, W. 1824. In: Flora Indica, eds W. Carey & N. Wallieh, Vol. 2. Mission Press, Serampore.
ROXBURGH, W. 1852. In: Flora indica, ed. W. Carey. Mission Press, Serampore.
SCHINZ, H. 1905. Plantae Menyharthianae, en Beitrag zur Kenntnis der Flora des unteren Sambesi. Denkschr. mat-nat. K. i. k. Akad. Wiss., Wien 78: 367–445.
SCHINZ, H. 1936. Plantae Menyharthianae, IV. Relação das plantas. Translated by A. Gomes e Sousa. Bol. Soc. Est. Col. Moçamb. 32: 293–330.
SEINER, F. 1911. Pflanzengeographische Beobachtungen in der Mittel-Kalahari. Bot. Jahrb. 46: 1–50.
SONDER, O.W. 1860. Celastrineae. In: Flora capensis, eds W.H. Harvey & O.W. Sonder, Vol. 1, pp. 451–472. Hodges, Smith and Co., Dublin.
STEEDMAN, E.C. 1933. A description of our trees, shrubs and lianas of southern Rhodesia. Rhodesian Printing and Publishing, Bulawayo.
THONNER, F. 1915. The flowering plants of Africa. Dublin, London.
THUNBERG, C.P. 1788. Resa uti Europa, Africa, Asia, Edman, Upsala.
THUNBERG, C.P. 1794a. Prodromus Plantarum Capensium, Part 1.
THUNBERG, C.P. 1794b. Travels in Europe, Africa and Asia. Richardson, London.
THUNBERG, C.P. 1818. Flora Capensis, 1st edn. Gerhardum Bonnierum, Hafniae.
THUNBERG, C.P. 1823. Flora Capensis, 2nd edn. A. Schultes. Stuttgart.
TRATTINICK, L. 1818. Archiv der Gewächskunde. Vol. 5. Wien.
TURCIANINOW, N.S. 1858. Animadversiones ad primam partem herbarii Turczaninowianae. Bulletin de la Société Impériale des Naturalistes de Moscou [Bull. Soc. Nat., Mosc.] 31(2): 452.
URBAN, I. 1916. Sertum antillianum. 8. Fedde Rep. 14: 331–343.
VAN WYK, P. 1974. Trees of the National Kruger National Park. Part 2. Purnell, Cape Town.
VAN WYK, P. 1984. Field guide to the trees of the Kruger National Park. 2nd impress. 1994. Struik, Cape Town.
VEGTER, I. 1966. Index herbariorium, Part II (6), Collectors S. Regnum veg. 114.
VERNON, C.J. 1994. List of trees debarked in the Border region. Naturalist 38: 3–9.
VERDCOURT, B. & TRUMP, E.C. 1969. Common poisonous plants of East Africa. Collins, London.
VILLIERS, J.F. 1975. Celastraceae. In: Flore du Cameroun, eds A. Aubréville & J.F. Leroy, Vol. 19, pp. 3-32. Muséum National D'Histoire Naturelle, Paris.
VON BREITENBACH, F. 1965. The indigenous trees of southern Africa. Vol. 4. The Government Printer, Pretoria.
VON BREITENBACH, F. 1974. Southern Cape forest and trees. The Government Printer, Pretoria.
WATT, J.M. & BREYER-BRANDWIJK, M.G. 1962. The medical and poisonous plants of southern and eastern Africa. 2nd edn. E. & S. Livingstone, Edinburgh.
WHITE, F. 1962. Forest Flora of Northern Rhodesia. Oxford University Press, London.
WILCZEK, R. 1960. Celastraceae. Flore du Congo Belge et du Ruanda-Urundi. Vol. 9: 113–232.