

## FSA contributions 21: Connaraceae

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**Keywords:** Connaraceae, Fabaceae, heterostyly, Oxalidales, southern Africa, taxonomy

### INTRODUCTION

Connaraceae R.Br. comprise mostly woody climbers, which climb by means of the winding ends of young branches, less often shrubs or small trees, and rarely rhizomatous shrublets. In the FSA-region, members are recognized by alternate, exstipulate, imparipinnately compound leaves, with transversely-ridged petioles; entire leaflet margins and oblique bases (*Cnestis*); and the actinomorphic, 5-merous flowers with stamens of two lengths. The usually single follicles are  $\pm$  ridged and swell to almost mature size well before the solitary, black or red arillated seeds develop, with the ripe seeds partly squeezed out of the follicle. Connaraceae are pan-tropical in distribution, but mainly southern hemisphere, with species occurring in both the Old and New World. Members of the family can be found in lowland rain forest or forest patches in savannas (Heywood 2007).

Cronquist (1981) placed Connaraceae in the Rosales and Takhtajan (1997) in the Connarales. The APG II and APG III (2003, 2009) and Reveal (2012) place the family in order Oxalidales, next to the Oxalidaceae, Brunelliaceae, Cephalotaceae, Cunoniaceae, and Elaeocarpaceae. Phylogenetic studies showed that Connaraceae are sister to Oxalidaceae (Nandi *et al.* 1998). These two families share the presence of heterostyly, benzoquinone rapanone, and extegmic seeds (Nandi *et al.* 1998), though Connaraceae are mainly a woody family and Oxalidaceae mainly herbaceous. The family is further subdivided into two subfamilies on the bases of the presence or absence of endosperm. Subfamily Jollydoroideae Gilg are further subdivided into three tribes of which both genera in the FSA-region belong to tribe Cnestideae Planch. (Lemmens *et al.* 2004; Reveal 2012).

Heterostyly is reported from  $\pm$  25 angiosperm families and is a floral device that promotes outcrossing, hence reducing the harmful effects of close inbreeding within a plant population (Barrett 1992). Tristyly has been claimed repeatedly as typical of the Connaraceae, with distyly and dioecy as derived conditions produced by sterilization of androecial or carpellary parts (Baker 1962). Tristyly is known to occur only in Amaryllidaceae, Lythraceae, Oxalidaceae, Pontederiaceae, Connaraceae (Barrett 1993) and Linaceae (Thompson *et al.* 1996).

The cuticle waxes of Connaraceae are morphological similar to those of Fabaceae (Fabales) (Ditsch *et al.* 1995), with which Connaraceae have frequently been confused. However, the two are not particularly close,

and can usually be distinguished because the Connaraceae lack stipules and have rather small, polysymmetric flowers with ten stamens of two different lengths, a combination of features unknown in Fabaceae (Leenhouts 1958a).

The plants are often poisonous (Mabberley 2008). The irritating hairs on the pods of *C. polyphylla* produce severe itching when touched (Watt & Breyer-Brand-wijk 1962). The family is of little economic importance. *Cnestis ferruginea* Vahl ex DC. is a shrub widely used in traditional African medicine for the treatment of various painful and inflammatory conditions (Ishola *et al.* 2011).

The flowers are reported to be faintly scented, with a wide diversity in forms of heterostyly accompanied by a self-incompatibility system, and are most likely pollinated by insects such as bees (Leenhouts 1958a). Connaraceae have strikingly coloured, dehiscent fruits with bicoloured seeds that are dispersed by birds or by small animals on the forest floors (Lemmens *et al.* 2004).

### MATERIAL AND METHODS

Two taxa were studied from herbarium specimens housed in PRE. The most important type specimens were accessed on websites, which are cited below. Acronyms for herbaria are listed in Holmgren *et al.* (1990).

### TAXONOMY

**Connaraceae R.Br.** in J.H. Tuckey, Narrative of an expedition to explore the river Zaire: 431 (1818); Gilg: 61 (1894); Schellenb.: 31 (1915); Mendes: 615 (1966); Breteler: 1 (1989); Jordaan: 229 (2000); Lemmens *et al.*: 74 (2004).

Evergreen or deciduous woody climbers, climbing by means of the winding ends of young branches, less often shrubs, small trees or a rhizomatous shrublet. *Stipules* absent. *Leaves* alternate, compound, unifoliolate, ternate, or imparipinnate in FSA-region; leaflets sub-opposite or alternate, entire; petiole pulvinate at base, transversely ridged. *Inflorescences* axillary or terminal racemes, panicles, or rarely fascicles. *Flowers* bisexual, or rarely unisexual, regular, 5-merous. *Sepals* imbricate or valvate, free or connate at base, caducous or often persistent and sometimes accrescent in fruit to strongly so. *Petals* free or slightly connate to middle, imbricate or rarely valvate. *Stamens* 10, in 2 whorls, free or connate at base, the 5 outer episealous ones longer than 5 inner epipetalous ones; filaments free or united basally into short tube; anthers dorsifixed, 2-theous, dehiscent

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longitudinally, introrse. *Gynoecium* superior, of 5, free, hairy, 1-locular carpels; ovules 2, collateral, nearly basal to nearly apical. *Fruit* of 5 follicles, sometimes connate at base, dehiscing by ventral suture. *Seeds* 1(2) per follicle, with or without endosperm; hilum lateral to basal; testa partly to entirely fleshy; sarcotesta (aril or pseudo-aril) sometimes partly free.

Genera 12, ± 110–200 spp. (Lemmens *et al.* 2004), pantropical in Central and South America, Africa, Madagascar, Southeast Asia, Malesia, Australia and the Pacific islands (Heywood *et al.* 2007); five genera and 110 spp. in the Neotropics (Forero 2012); nine genera and 48 spp. in sub-Saharan Africa (Klopper *et al.* 2006); five genera and 11 spp. in Madagascar (Madagascar Catalogue 2012); six genera and nine spp. (one endemic) in China (Lingdi & Turland 2003); six genera and ± 40 spp. in Malesia (Leenhouts 1958a); two genera and two spp. in Australia (Australian Tropical Rainforest Plants); two genera and two spp. occur naturally in southern Africa.

*Key to genera for FSA-region (after Jordaan 2000)*

Leaflet apex tapering, base asymmetric; flowers in terminal or axillary racemes, often clustered in old leaf bases (cauliflorous); follicles velvety, ± rostrate; seed with endosperm, seed coat 2-coloured ..... *Cnestis*

Leaflet apex rounded, base symmetric; flowers in few-flowered, axillary racemes, usually produced before leaves; follicles glabrous or glabrescent, mostly acute to rounded apically; seed without endosperm, seed coat entirely fleshy and red ..... *Rourea*

***Cnestis*** Juss. in A.L. de Jussieu, *Genera plantarum secundum ordines naturales disposita*: 374 (1789); DC.: 86 (1825); Endl.: 1140 (1840); Sonder: 527 (1860); Hook.: 433 (1862); Gilg: 67 (1894); Burt Davy: 511 (1932); Hemsl.: 2 (1956); Mendes: 615 (1966); Lemmens: 174 (1989). Type species: *C. polyphylla* Lam., fide Lemmens (1989).

Woody climbers, shrubs or rarely small trees; branches cylindrical, hairs multicellular. *Leaves* imparipinnately compound, alternate; leaflets opposite or alternate, often asymmetric and often also acuminate. *Inflorescences* racemose, or occasionally in panicles, fascicles, or flowers solitary on main stem, axillary, usually more than 1 together in axil of single leaf, sometimes pseudoterminal. *Flowers* bisexual or unisexual with some bisexual, small, hairy, heterostylous, often heterodistylous, white, yellowish or tinged red; pedicels with distinct joint. *Sepals* ± free, imbricate in bud. *Petals* shorter, as long as, or somewhat longer than sepals, free, imbricate in bud, hairless or with some hairs outside near base. *Stamens* with filaments free or shortly connate at base, glabrous, outer slightly longer than inner; anthers usually recurved with age. *Gynoecium* of 5, free, sessile carpels; ovules (1)2 per locule; styles often pilose at base, short, included; stigmas capitate. *Fruit* 1–5 follicles per flowers, reniform or cylindrical, curved or undulated, beaked or not, opening lengthwise along ventral suture, densely hairy and sometimes also with long rigid hairs outside and with rigid, easily detached, stinging hairs inside. *Seed* 1, attached to base of follicle, ovoid, with yellow to red sarcotesta at base,

surrounding hilum; testa black and glossy; endosperm present, abundant.

Genus of ± 13 spp., largely restricted to tropical Africa and Madagascar, but one or two in tropical Asia; 1 sp. in southern Africa, usually found in rain forest and savanna.

*Etymology*: *Cnestis* is derived from the Greek word *knesiao* = to itch, and *knestis* = a rasp, referring to the hairs on the fruits which cause itching when touched (Glen 2004).

***Cnestis polyphylla*** Lam., *Encyclopedie Methodique, Botanique* 3: 23, pl. 387 (1789); Planch.: 440 (1850); Schellenb.: 13 (1910); Lemmens: 220 (1989); Beentje: 434 (1994); M.Coates Palgrave: 252 (2002); Lötter: 142 (2002); Boon: 132 (2010). Type: Madagascar, *Commerçon s.n.* [P-JU—digital image, lecto!., designated by Lemmens: 220, 224 (1989); MPU—digital image!, isolecto.].

*C. glabra* Lam.: 23 (1789); DC.: 87 (1825); Planch.: 440 (1850); Schellenb.: 13 (1910); Schellenb.: 318 (1938). Type: Mauritius, *Commerçon 599* [P P00364940—digital image, lecto!., designated by Schellenberg: 40 (1938); L, isolecto.].

*Zanthoxylum natalense* Hochst.: 304 (1844). *Cnestis natalensis* (Hochst.) Planch. & Sond.: 528 (1860); Gilg: 215 (1896); Schellenb.: 14 (1910); Baker f.: 50 (1911); Schellenb.: 318 (1915); Burt Davy: 511 (1932); Schellenb.: 40 (1938); Mendes: 616 (1966); Mendes: 2 (1969). Type: South Africa, KwaZulu-Natal, between Umlaas River and Durban [Port Natal], 1840, *Krauss 60* [K—digital image, holo!., fide Lemmens (1989)].

*Omphalobium? discolor* Sond.: 24 (1850). Type: South Africa, KwaZulu-Natal, Durban [Port Natal], *Gueinzus 54 & 577* (?S, syn.).

*Cnestis polyphylla* var. *bullata* Baill.: 243 (1867). *Cnestis bullata* (Baill.) Baill.: t. 17 (1886). Type: Madagascar, St Marie Island, *Boivin 1889* (P, holo.).

*C. lurida* Baill.: 244 (1867); Schellenb.: 15 (1910). Type: Madagascar, Nossi-Bé Island, December 1851, *Boivin s.n.* (P P00364937—digital image, holo!).

*C. boiviniana* Baill. ex Schellenb.: 39 (1938); Kerudren: 18 (1958). Type: Madagascar, St Marie Island, *Boivin s.n.* (P—digital image, holo!).

*Nomenclatural note*: Lemmens (1989) gives no reason for changing the author citation of *C. natalensis* (Hochst.) Planch. ex Sond., formerly Planch. & Sond. (Mendes 1966). Hochstetter (1844) originally described this plant in the genus *Zanthoxylum*, which belongs to the Rutaceae, and it was not mentioned by Planchon (1850) in his monograph of Connaraceae. The combination was published ten years later in Sonder's (1860) account of Connaraceae in Harvey & Sonder's *Flora capensis*, where he stated the author citation clearly as Planch. & Sond.; a citation which I follow here. Sonder presumably saw Planchon's (1850) monograph on the

Connaraceae, which was published in the same volume of *Linnaea* in which Sonder (1850) himself published *Omphalobium discolor* for the same entity, but only later connected Hochstetter's plant with the Connaraceae.

Shrub, robust climber or small tree with trailing branches, up to 4 m tall, multi-stemmed, much-branched; branches cylindrical, 10–25 mm in diam., usually distinctly lenticellate, densely brown hairy at first becoming almost hairless with age. *Leaves* crowded towards ends of branches, imparipinnately compound, alternate, 3–9(–14)-jugate; leaflets opposite, subopposite or alternate, slightly overlapping, thinly leathery, dark green above, much paler below, glabrous above, glabrescent below with scattered hairs confined to midrib and veins; leaflet lamina obovate to oblong, 20–40 × 9–15 mm, apex obtuse to acute or abruptly acuminate, base asymmetric, obliquely rounded to truncate or shallowly cuneate, margin entire, midrib and lateral veins sunk above, prominently raised beneath, lateral veins looping near margin, reticulate tertiary venation conspicuous on both sides; rachis 60–180(–250) mm long, with cinnamon hairs; petiole up to 100 mm long; petiolule up to 2 mm long, hairy. *Inflorescences* racemose, 5–30-flowered, 40–80(100) mm long, axillary or pseudoterminal, much shorter than leaves, densely hairy; bracteate, bracts densely hairy. *Flowers* small, heterostylous, whitish green or greenish yellow, on old wood, usually borne below leaves, bisexual or unisexual. *Sepals* narrowly triangular, ± 2–5 × 1–2 mm, free, reflexed, brown pilose outside. *Petals* narrowly elliptic to narrowly obovate, (1.5–)3.5–4.5 × 0.5–1.5 mm, free, spreading, truncate or retuse, glabrous or with some long hairs in basal part outside. *Stamens* 10, in 2 whorls, free or connate at base, slightly differing in length, 1–4 mm long; anthers ± 0.5 × 0.4 mm, *Gynoecium* of 5, free, sessile carpels; ovary 0.5–1.0 mm long, yellowish, pilose; ovules (1)2 per locule; style straight or recurved, pilose in basal part, included; stigma usually oblique, 2-lobed. *Follicles* 1(–5), obliquely pear-shaped, 15–25 × 7–10 mm, with a curved or twisted beak up to 4 mm long, covered with irritating yellowish hairs inside, sparsely hairy outside, apricot-coloured when ripe, ventrally dehiscent. *Seed* 1, ovoid, 8–18 × 3–9 mm, glossy black; sarcotesta yellow, 3–9 mm long, ruminant (Figure 1).

*Taxonomic note:* Lemmens (1989) has a very broad species concept of this taxon, occurring in three well disjunct areas: (i) Madagascar, Mauritius and Reunion; (ii) Kenya; and (iii) southern Africa (including Zimbabwe and Mozambique). The southern African component of this taxon was formerly known as *Cnestis natalensis* (Hochst.) Planch. & Sond, e.g. Burt Davy (1932), Mendes (1966, 1969), Ross (1972), and differs from Malagasy material in its glabrescent, smaller leaflets, 20–40 mm long (vs. mostly longer than 50 mm, occasionally 40 mm long) very oblique and truncate bases. Madagascar specimens have leaflets with mostly symmetric, cordate to subcordate bases, and the indumentum varies from pilose to pubescent on the undersurface of the leaflets, although the inclusion of *C. glabra* indicates some glabrous forms. Specimens from mainland southern African also have relatively broader sepals, up to 5 mm wide at base, and often pilose inside, and the follicles are distinctly beaked. Madagascar

specimens have narrower sepals, 1–2 mm wide, glabrous inside, and the follicles are truncate and usually not distinctly beaked. Lemmens (1989: 224) argued that material from an isolated population in Kenya bridges the differences in characters of leaflets, sepals and fruits between Africa and Madagascar, which makes it impossible to maintain the South African taxon as distinct. Unfortunately, no material of the Kenyan population at Mombasa are housed in the National Herbarium in Pretoria (PRE) and morphological differences could not be studied. This needs further investigation. If three distinct species are involved, the Kenya plants require a new name, and southern African material will revert to *C. natalensis*. Alternatively, differences could be recognized at least at subspecific rank.

*Common names:* itch-pod, *jeukpeul* (Afrikaans), *monêpênêpê* (Northern Sotho), *lihlozi* (Swazi), *ihlozi* (Zulu) (Van Wyk *et al.* 2011).

*Distribution and habitat:* eastern parts of southern Africa from Limpopo to the Eastern Cape as far south as Kentani and northwards to Eastern Zimbabwe and adjacent Mozambique on the Chimanimani Mountains (Figure 2), with a population in Mombasa on the Kenyan coast; also in Madagascar, Mauritius and Reunion. It grows as understory component in coastal, lowland or escarpment forest, on rocky slopes at low to medium elevations.

#### *Selected specimens*

ZIMBABWE.—**2032**: Mannicaland, Chipinge Dist., Farm Brabant, Rusitu Valley, (–AA), Van Wyk BSA1045, BSA1232.

LIMPOPO.—**2229** (Waterpoort): Louis Trichardt, Hanglip Forest Reserve, (–DD), Van Wyk 5987. **2230** (Messina): Venda, Khalavha, (–CD), Mbedzi 1564; Zoutpansberg Dist., Makonde Mission Station, 15 miles NE of Sibasa, (–DC), Codd 6861. **2330** (Tzaneen): Zoutpansberg Dist., on Tzhakoma, Entabeni Forest Reserve, (–AB), Poynton PRE54918.

MPUMALANGA.—**2430** (Pilgrim's Rest): Mariepskop, (–DB), Van der Schijff 4733, 5058, 6217. 2530 (Lydenburg): Lydenburg Dist., Witklip, (–BD), Kluge 581.

SWAZILAND.—**2531** (Komatipoort): Piggs Peak, (–CD), Compton 31560.

KWAZULU-NATAL.—**2732** (Ubombo): Ingwavuna Dist., Gwaliweni Forest [Hlatikulu Forest], (–AC), Stephen 776; Sodwana Bay, Sibayi area, (–BC), Van der Schijff 6586A. **2831** (Nkandla): Eshowe, (–CD), Thode A1230; Ngoye Forest Reserve, (–DC), Venter 2253. **2832** (Mtubatuba): Hlabisa Dist., Hluhluwe Game Reserve, (–AA), Ward 2830. **2930** (Pietermaritzburg): 9 miles NW of New Hanover, (–BC), Codd 1441; Pietermaritzburg, Table Mountain, (–CB), Killick 85. **2931** (Stanger): 2 miles W of Stanger, (–AD), Moll 2198. **3030** (Port Shepstone): Umzinto Dist., Vernon Crookes Nature Reserve, (–BC), Balkwill & Cadman 2212. **3130** (Port Edward): Umtamvuna Reserve, Braemar Farm, (–AA), Nicholson 1599.

EASTERN CAPE.—**3029** (Kokstad): Mount Auliff, Fort Donald, (–CD), Sim 2369; Bizana Dist., (–DD), Acocks 10937. **3129** (Port St Johns): Egossa, (–BC), Srey 8924; Mkambati Reserve, Daza Forest, (–BD), Brand *et al.* 353; Umgazi River Mouth, (–CB), Pienaar 133; Port St Johns Dist., Umzimvubu River Valley, (–DA), Balkwill *et al.* 1883. **3228** (Butterworth): Kentani, (–CB), Pegler 803.

*Rourea Aubl.* in Histoire des plantes de la Guiane Française: 467 (1775), name conserved against *Kalawael* Adanson (Leenhouts 1958b); Juss.: 369 (1789); Baill.: 228 (1867); Jongkind: 310 (1989). Type species: *R. frutescens* Aubl.



FIGURE 1.—*Cnestis polyphylla*. A, flowering branch,  $\times 1$ ; B, leaflet with asymmetric base,  $\times 1$ ; C, short-staminate flower,  $\times 4$ ; D, flower in cross section,  $\times 8$ . A–D from Pegler 803; E, mature beaked follicle with extruding seed,  $\times 2$ ; F, seed with pseudo-aril (sarcotesta),  $\times 2$ , E & F from Mthonti 1b. Artist: Marguerite Scott.

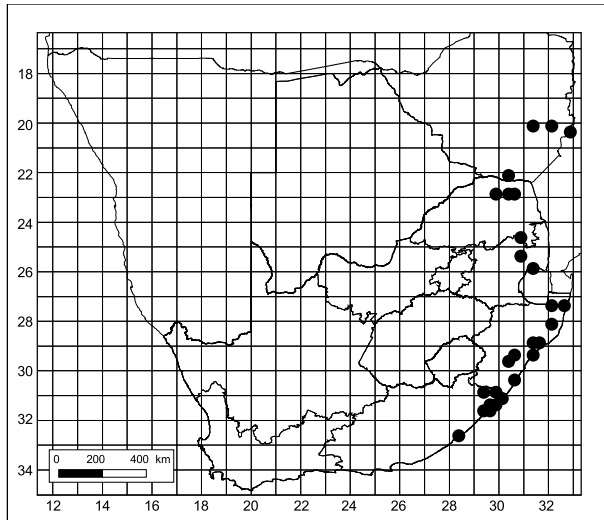


FIGURE 2.—Distribution of *Cnestis polyphylla* in southern Africa.

*Byrsocarpus* Schumach.: 226 (1827). Type species: *B. coccineus* Schumach. & Thonn. (1827), lecto., designated by Schellenb.: 146 (1938).

Climbers, shrubs or trees; branches cylindrical or clearly lobed, often ending in a tendrilloid tip, usually with lenticels. *Leaves* imparipinnately compound, leaflets opposite or subopposite, usually  $\pm$  symmetric. *Inflorescences* axillary, paniculate or racemose, sometimes 1–more together at end of leafy branch, forming a terminal synflorescence. *Flowers* bisexual, heterodistylous, white, tinged yellow or red, sweet-scented, produced before leaves; pedicel always with a distinct joint. *Sepals* free or almost completely connate, imbricate in bud, ciliate, persistent and accrescent soon after pollination. *Petals* as long as to much longer than sepals, free or connate at base, often inrolled or folded, hairless or with few apical hairs. *Stamens*: filaments connate into a short tube, hairless. *Gynoecium* of 5, free carpels; ovules 2, basal; style terete; stigmas  $\pm$  capitate. *Fruit* a follicle, 1–5 per flower, ovate to elliptic with rounded to acute apex or beaked, hairless or velutinous, with orange to red glandular hairs outside, hairless inside, with persistent calyx, dehiscing by a ventral suture or circumscissile at base. *Seed* solitary, rarely 2 per follicle, subovoid to ellipsoid, completely or partially enclosed in a brightly coloured sarcotesta (aril) fused with the partly to almost totally fleshy testa; hilum basal, without endosperm.

Genus of  $\pm$  68 spp., in tropics in Old and New World, in forests and savanna; 48 spp. in Neotropics, Mexico to Brazil (Forero 2004, 2012: Neotropical Connaraceae website); eight spp. in Sri Lanka and Malesia, Australia and Melanesia (Leenhouts 1958a); 12 spp. in tropical Africa and Madagascar (Klopper *et al.* 2006); one species in southern Africa.

*Note*: the southern African species was formerly treated in regional Floras in the genus *Byrsocarpus* (e.g. Hemsley 1956; Mendes 1966, 1969). Since Jongkind (1989) revised the genus for the whole of Africa, he placed *B. orientalis*, originally described by Baillon (1867) based on a plant collected in Kenya, into *Rourea orientalis*. He further divided *Rourea* into five sections,

placing the southern African species in sect. *Byrsocarpus* (Thonn. ex Schumach.) Jongkind.

*Etymology*: *Rourea* is derived from Arourea parish, French Guiana (Glen 2004). The type species, *R. frutescens*, was first described from French Guiana by Aublet (1775), who was a French explorer and botanist and founder of the knowledge of the flora of Guyana (Stafleu & Cowan 1976–1988).

***Rourea orientalis* Baill.** in *Adansonia* 7: 230 (1867); Keraudren: 4 (1958); Jongkind: 310 (1989); M.Coates Palgrave: 252 (2002); Curtis & Mannheimer: 118 (2005). *Byrsocarpus orientalis* (Baill.) Baker: 452 (1868); Schellenb.: 42 (1910); Hemsl.: 17 (1956); Mendes: 624 (1966); Mendes: 6 (1969). Type: Kenya, Mombasa, *Boivin s.n.* (P—digital image, holo!).

*Byrsocarpus tomentosus* Schellenb.: 452 (1919); Troupin: 92 (1952). Type: Tanzania, Songea, *Busse 804* (B—digital image, holo!; EA—digital image!, G—digital image!, iso.).

*Byrsocarpus usambaricus* Schellenb.: 154 (1938). Type: Tanzania, E Usambara, Longusa-Sigital, *Peter 40014* (B—digital image, holo!).

Scrambling shrub, climber or tree up to 6 m tall; young branchlets densely to sparsely hairy, reddish brown or grey-brown, with conspicuous raised lenticels. *Bark* smooth, mottled brown-purple. *Leaves* drooping on rachis, compound, 6–14-jugate, up to 200 mm long, glabrous above, hairless or with scattered hairs below, bright green above, paler beneath; leaflet lamina elliptic to elliptic-oblong, 12–40  $\times$  7–19 mm, apex obtuse-aristate, base rounded to broadly cuneate, margin entire, midrib sometimes densely hairy; rachis up to 250 mm long. *Inflorescence*: rhachis up to 50 mm long, hairless or hairy. *Flowers* white to pale yellow, up to 30 mm in diam., sweetly lemon-scented. *Sepals* ovate, up to 3  $\times$  2 mm, puberulous, hairs especially dense on midvein and margins. *Petals* narrowly elliptic, 7–11  $\times$  1.5–3.5 mm, membranous, sometimes folded at top, glabrous. *Stamens* 10; long-staminate flowers with longer stamens  $\pm$  7 mm long and shorter stamens  $\pm$  4 mm long; short-staminate flowers with longer stamens  $\pm$  3 mm long and shorter stamens  $\pm$  2 mm long; filament-tube 1–2 mm long. *Ovary* ovoid,  $\pm$  1 mm long, densely hairy; styles of long-staminate flowers up to 1.5 mm long, usually recurved; styles of short-staminate flowers to 4.5 mm long. *Follicle* 15–23  $\times$  5–12 mm, symmetrical, apically rounded, red-brown, glabrous, calyx spreading at maturity. *Seed* up to 15  $\times$  8 mm, completely enclosed in a bright red pseudo-aril (Figure 3).

*Common names*: shortpod, *kortpeul* (Afrikaans), *mukolwe* (Lozi) (eastern Caprivi Strip), *chidzimamuro* (Manyika, Ndau) (Manicaland in Zimbabwe and Mozambique), *nhantsanga* (Sena) (Mozambique, Sofala and Tete Provinces) (Van Wyk *et al.* 2011).

*Distribution and habitat*: in the FSA-region only in the extreme northeastern corner of Botswana and the Caprivi Strip of Namibia, extends northwards to Eastern Angola and southeast Democratic Republic of Congo (DRC), and eastwards through Zambia, Malawi, Zimbabwe and Mozambique to Tanzania (including Zanzi-

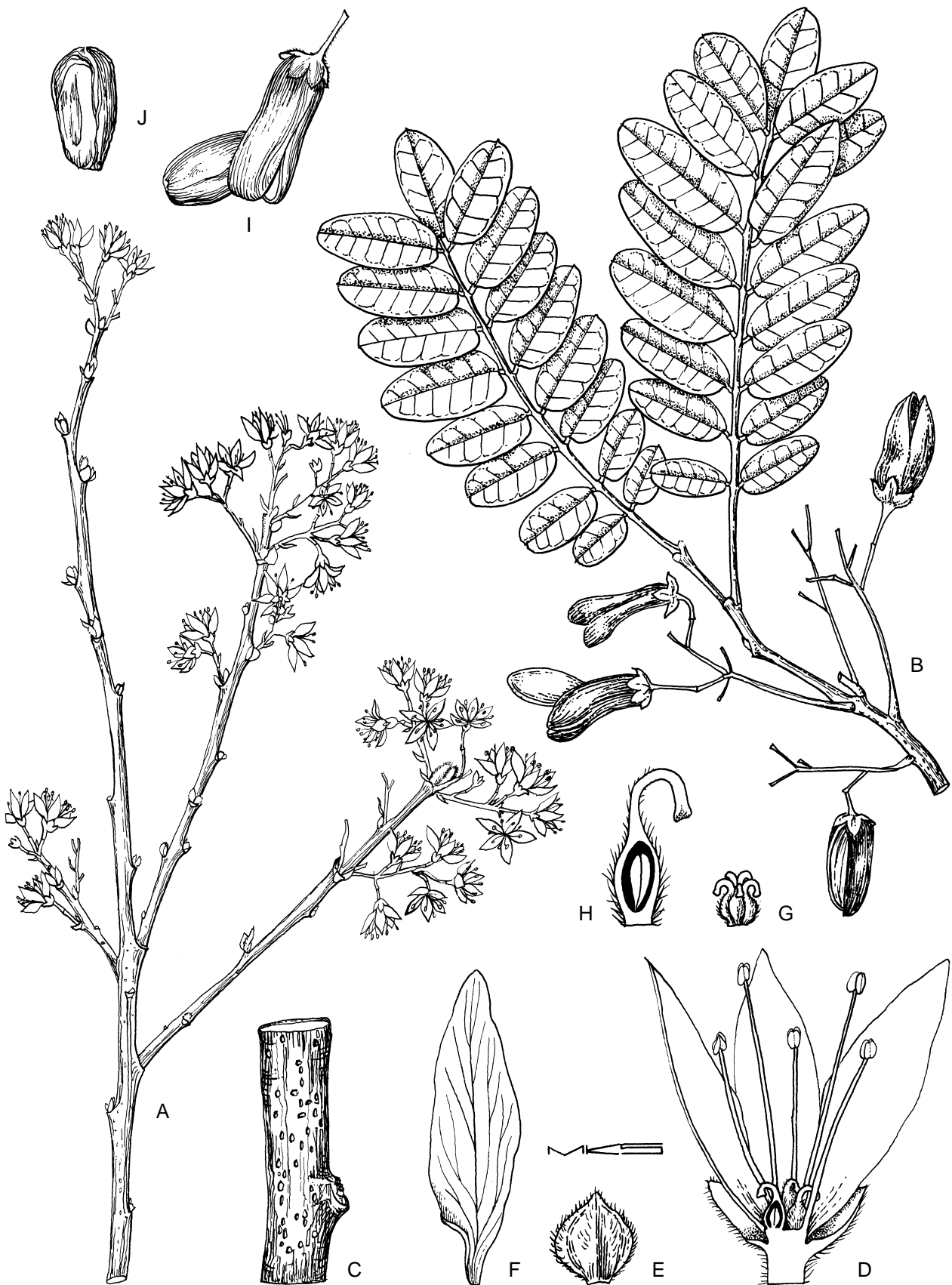


FIGURE 3.—*Rourea orientalis*. A, leafless flowering branch,  $\times 1$ , from *Miller B/1099*; B, fruiting branch,  $\times 1$ ; C, portion of bark showing lenticels,  $\times 3$ , B & C from *Killick 3389*; D, long-staminate flower with stamens of two lengths and pistils in cross section,  $\times 6$ ; E, sepal,  $\times 6$ ; F, petal,  $\times 6$ ; G, gynoecium,  $\times 6$ ; H, carpel cut open showing ovules and recurved style in cross section,  $\times 2$ , D–H from *Miller B/1099*; I, mature follicle with extruded seed,  $\times 2$ ; J, seed completely covered by pseudo-aril,  $\times 2$ , I & J from *Killick 3389*. Artist: Marguerite Scott.

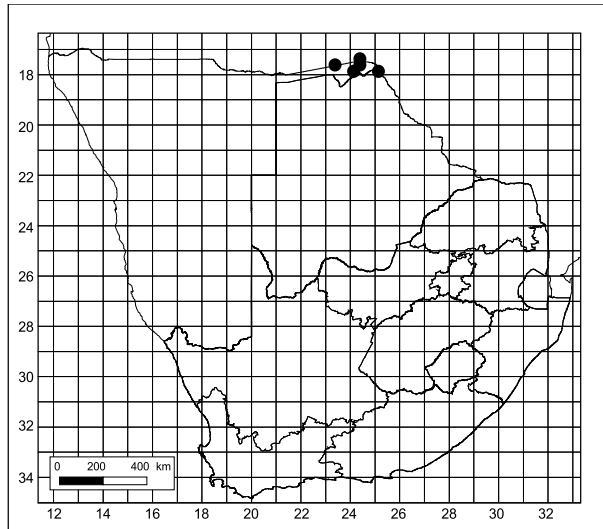


FIGURE 4.—Distribution of *Rourea orientalis* in FSA-region.

bar) and Kenya; also in Madagascar (Keraudren 1958). It grows on margins of thicket, savanna or woodland in riverine vegetation, floodplains, often on termitaria, on sandy loam or alluvial soil. For tropical African distribution see Figure 171 in Jongkind (1989) for FSA distribution see Figure 4.

#### Selected specimens

NAMIBIA.—1723 (Singalamwe): Western Caprivi Strip, Kwando Flood Plain, (–CB), *Tinley 1530*. 1724 (Katima Mulilo): Katima Mulilo, S of Hippo Lodge, (–AD), *Venter et al. 92*; on small track between Katima Mulilo and Kwena village, (–CB), *Hines 1120*; Maningi Manzi, (–CC), *Müller 1704*. 1725 (Livingstone): Impalela Island, (–CC), *Pienaar & Vahrmeyer 198*.

BOTSWANA.—1725 (Livingstone): Chobe Dist., between Kasane and Kazungula, (–CC), *Müller B/1129*.

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