



Two new African species of *Salacia* (*Salacioideae*, *Celastraceae*)

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Key words

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Abstract Two new African species of *Salacia* (*Salacioideae*, *Celastraceae*) are described. *Salacia arenicola* is a scandent shrub endemic to a restricted white sand habitat in coastal Republic of Congo. It is assessed as IUCN 2012 category Vulnerable (VU). *Salacia nigra* is an erect shrub or small tree with dark purple flowers and large leaves found in the wet coastal forests of Cameroon and Nigeria and is also assessed as Vulnerable. A key to non-lianescent tropical African *Salacias* is given.

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INTRODUCTION

Salacia L. is a genus of about 200 species of lianas, shrubs, and small trees found throughout the tropics (Simmons 2004). Around half the species are found in tropical Africa and around 80 of these in the Cameroon-Gabon centre of biodiversity. The most recent review of the entire genus is an unpublished thesis by Hedin (1999). Recent species description has been confined to South America (Lombardi 2007, 2009, 2010) and India (Udayan et al. 2012, 2013).

The species of Cameroon and Gabon are comprehensively treated by Hallé (1987, 1990). The species of Central Africa are described by Wilczek (1960) and Southern Africa by Robson (1966). Since Hallé's flora accounts no new African species have been described. Jongkind (2006) gave the name *S. hallei* Jongkind to an unnamed taxon in Hallé's treatment.

Little molecular work has been done on infrageneric classification of *Salacia*. The neotropical *Salacias* and related genera appear to form a separate clade from those of the paleotropics (Coughenour et al. 2010). Keys to *Salacias* are based on presence/absence of resin (expressed as translucent threads in broken leaves), angles and confluence of the anther thecae, inflorescence structure, and numbers of locules and ovules. Hallé's treatment breaks the species down into ten groups using these and other floral characters. Their phylogenetic significance, if any, is unclear.

Species delimitation is difficult and Hallé appears to us to be somewhat inconsistent, sometimes joining related taxa into a single species (*S. lehmbachii* Loes. with six varieties and two forma; *S. staudtiana* Loes. with five varieties) and in other cases letting existing closely related taxa stand.

Salacia arenicola joins a group of resin-containing sarmentous shrubs in Hallé's (1987) groups 9 and 10 including *S. pyriformis* (Sabine) Steud. and *S. senegalensis* (Lam.) DC. both of which are also found in dune and coastal habitats.

Salacia nigra is one of a group of closely related shrubs and small trees in Hallé's (1987) group 3 including *S. lolensis* Loes. and *S. pallescens* Oliv.

TAXA

Salacia arenicola Gosline, *sp. nov.* — Fig. 1, 2a–c; Map 1

Diagnosis: Similar to *Salacia stuhlmanniana* Loes. but differing in several aspects including: having reddish branchlets rather than grey; flowers drying yellow rather than brown-black; stamens twice length of pistil rather than the same length; fruits with a thin (c. 1 mm) leathery vs a thick (3–4 mm) woody exocarp. — **Type:** *Mpandzou*, A.L. 1262 (holo IEC; iso K, P, WAG), Republic of Congo, Kouilo Department, Pointe Noire [S4°41'58.9" E11°48'22.6"], 10 July 2011.

Etymology. The species epithet ('sand dwelling') refers to its white sand habitat.

Scandent shrub or liana to 5 m tall, glabrous with copious resin. **Shoots** terete, lenticellate, twigs dark red. **Leaves** opposite to subopposite, elliptic to lanceolate, 4–10 by 1–5 cm, apex rounded to shortly acuminate (acumen to 4 by 3 mm), base attenuate, lamina coriaceous, margin entire or with minute teeth sometimes present towards apex, leaf margin revolute when dried, concolorous, drying light green, upper surface smooth, midrib prominent above and below, 6–8 pairs of secondary veins barely visible above, more prominent below, bending sharply upwards c. 5 mm from the margin, tertiary venation reticulate apparent below, fainter above. **Petiole** 8–20 mm long, 20–25 % of the length of the lamina, drying darker than lamina, canaliculate, margins straight, showing a clear dehiscence ring at junction with shoot. **Inflorescence** an axillary fascicle or glomerule holding 4–14 flowers on a peduncle 0–1 mm long, bracts fimbriate less than 0.1 mm long. **Flowers** yellow 5–7 mm diam, very fragrant smelling of hyacinth at 2 PM (pers. obs. Gosline 10 July 2011); pedicels thin 8–10 mm long; sepals 5, subequal, ovate, 1 mm long, fimbriate; petals 5, ovate-oblong, 3 by 2 mm, membranaceous, disk green cylindrical (Hallé's tronconique (1987: 33)) 0.1 mm tall by 0.3 mm diam with an abrupt upper edge and no impressions above; stamens 3, filaments 3 mm long, not apiculate, thecae 0.1 mm long, confluent at an angle of 90°; style 1 mm long, tapering to a single point; locules 3 each with 2 superposed ovules. **Fruits** glossy

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Fig. 1 *Salacia arenicola* Gosline. a. Habit; b. examples of leaf shape (mature mid-shoot leaves); c. bark from main stem of a; d. inflorescence (from photograph); e. inflorescence base showing one flower in situ as seen from above the inflorescence; f. flower, lateral view; g. flower underside showing asymmetric calyx lobes; h. vertical section of newly opened flower; i. stamen, outer face; j. stamen, inner face; k. style, ovary and disk; l. transverse section of ovary; m. transverse section of style; n. infructescence (from photograph); o. transverse section of 2-seeded dried fruit (a–d, f–m: Mpandzou 1262; O Kami T 1270). — Scale bars: a, b, d, l, n, o = 1 cm; c, e–g, i–l = 1 mm; m = 500 μ m. — Drawn by Andrew Brown.



Fig. 2 a–c: *Salacia arenicola* Gosline. a. Habit; b. fruits; c. flowers and stem showing lenticels. — d: *Salacia nigra* Cheek. Fruiting specimen. — Photos by: a, c: G. Gosline; b: M. Cheek.

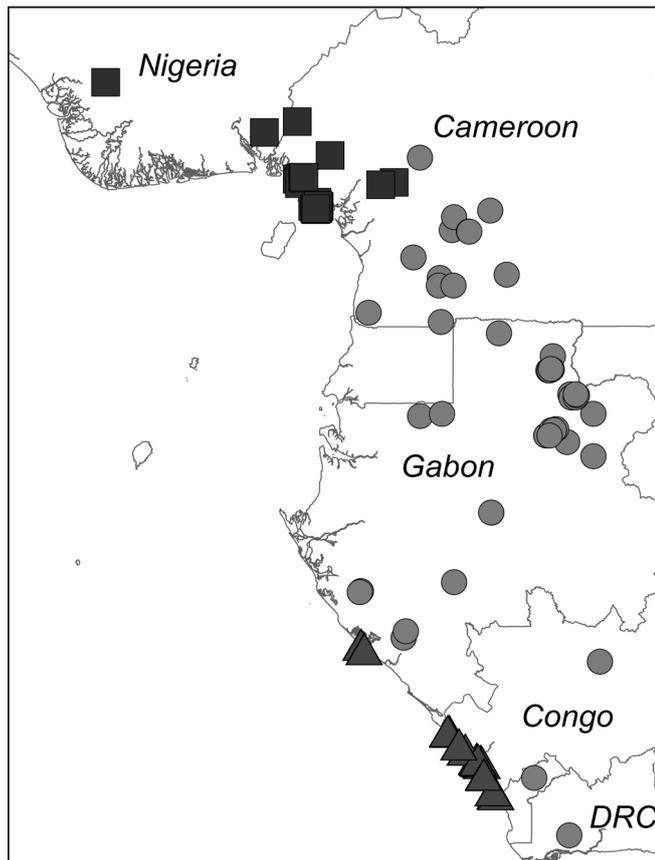
orange spherical 2–3.5 cm diam, fruiting pedicel 0.2–0.6 cm long by 0.4 cm diam; pericarp smooth less than 1 mm thick, flesh sweet, edible; seeds 1(3), spherical 1.2 cm diam when solitary, flattened when multiple.

Distribution & Ecology — Known only from a restricted white sand thicket habitat along the coast of the Republic of Congo, possibly extending into neighbouring Gabon and to be searched for on the coasts of Cabinda, DRC, and Angola.

Representative specimens. GABON, Ogooué-Maritime Province, near beach south of Gamba, *Breteler 14951* (WAG, photo only seen), 6 Nov. 1998; Gamba, shore of Vevy-lagoon, *Wieringa 1169* (WAG, photo only seen), 15 June 1992. — REPUBLIC OF CONGO, Kouilo Department, Conkouati, *Mpandzou 1862* (IEC, K), 11 Dec. 2012; Djeno, *Mpandzou 1784* (IEC, K), 7 Dec. 2012; Fouta, *Kami T 1295*, 29 Nov. 2011 (IEC, K, MO, P, WAG); Bas-Kouilou near Madingo-Kayes, *Kami T 1342* (BR, G, IEC, K, MO, P, WAG), 3 Dec. 2011; Mvandji, *Nkondi 506* (IEC, K), 13 Apr. 2013; Plage Longo-Boudji, *Mpandzou 1888* (IEC, K), 12 Dec. 2012; Pointe Noire, *Kami T 1270* (BR, G, IEC, K, MO, P, PRE, US, WAG), 26 Nov. 2011; Tchiele, *Nkondi 768* (IEC, K), 17 Apr. 2013; Tchimpounga, *Mpandzou 1647* (IEC), 5 Nov. 2012.

Conservation assessment — An assessment of Vulnerable (VU B2ab(iii)) is given here using the categories of IUCN (2012). This is on the basis of restricted range (the ten locations listed

above, Extent of Occurrence (EOO) 3 400 km², Area of Occupancy (AOO) 76 km²) and continuing development pressure on the habitat at most of the ten locations. The habitat is essentially a narrow linear corridor just inland of the shore. Thanks to the support of the Zanaga project the habitat of *S. arenicola* in Republic of Congo has been well surveyed; the species has been targeted in five surveys along the entire coast of the Republic of Congo between 2010 and 2013. During this period building of houses north of Pointe Noire destroyed some of the habitat (Van der Burgt pers. comm.). A new port is proposed for the Pointe Indienne area to the north of Pointe Noire and a large oil refinery occupies the southern end of the species range at Djeno. Eight km of this habitat close to the coast is protected by the Tchimpounga Nature Reserve and a small patch has been found in the Conkouati Reserve. The largest known population of the species occurs at Bas-Kouilo where about 50 plants were seen in 2013 (Cheek pers. obs.). The remainder of the range is subject to active exploitation and development especially in the Djeno area where the habitat is being rapidly cleared and may soon be eradicated due to urbanization and activities apparently linked to the Total oil refinery. At Plage Longo-Boudji, Mvandji and Tchiele tourism has resulted in clearance of part



Map 1 Distribution of *Salacia arenicola* Gosline (▲), *S. nigra* Cheek (■) and *S. mayumbensis* Exell & Mendonça (●).

of the habitat. However, at Mvandji, Fouta (Van der Burgt pers. comm.) and near Madingo-Kayes (Bas-Kouilo) threats remain low.

The Gamba region in Gabon is an area of large scale oil projects including refineries. The WWF has a project in the area in conjunction with Shell oil which is focussed on control of bush meat trade. The full extent of the white sand habitat and threats in Gabon are unknown.

If present trends continue the species could soon be reassessed as Endangered. Both EOO and AOO are within the range for the IUCN (2012) EN rating which will apply if the number of locations drops to five.

Notes — In the Flore du Gabon *S. arenicola* specimens key to *S. stuhlmanniana*, but with clear differences in flowers, fruits and vegetative characters noted in the diagnosis above. *Salacia stuhlmanniana* has an Eastern African distribution. Hallé (1987) synonymizes *S. lomensis* Loes. from West Africa, but the latter has smaller leaves and Robson (1966) questions the inclusion. The two populations have identical flowers and fruits and differ only in leaf size and twig surface and we agree with Hallé that they should be considered subspecies.

Also growing in these coastal thickets is *S. cornifolia* Hook.f. which is found from Liberia to the Congo Republic, primarily in coastal sandy soils. *Salacia arenicola* is easily distinguished from *S. cornifolia* by the presence of resinous threads in the leaves, more distinct venation and smooth rounded rather than irregularly shaped fruits.

Other related species found in coastal and subcoastal habitats around Africa (but not sympatric with *S. arenicola*) are *S. madagascariensis* (Lam.) DC., *S. senegalensis* (Lam.) DC. and *S. kraussii* Harv., all containing resin.

Few *Salacias* are recorded as scented; this species was discovered because of its strong odour of hyacinth (*Hyacinthus*).

The large glossy bright orange fruits of *S. arenicola* are edible and probably dispersed by chimpanzees which still occur in its white sand habitat in the Tchimpounga Reserve (Cheek pers. obs. 2012). The leathery pericarp must be pierced to access the refreshing, slightly sweet orange pulp that surrounds and is strongly attached to the usually single seed (Cheek pers. obs. 2012).

***Salacia nigra* Cheek, sp. nov.** — Fig. 2d, 3; Map 1

Salacia sp. A Keay (1958) 1, 2: 632.

Salacia sp. nov. "SALS" Thomas et al. (2003) 34.

Salacia loloensis Loes. var. *sibangana* sensu Gosline, van der Burgt & Cheek (2004) 134 non Hallé.

Salacia sp. nov. 1 Cable & Cheek (1998) xlvii & 30.

Similar to *Salacia mayumbensis* Exell & Mendonça but being a larger tree (to 15 m), having larger leaves (to 40 cm rather than 25 cm) with no or indistinct marginal teeth, dark purple rather than yellow flowers, no radial striations on the disk and larger fruits. — Type: Groves, M. 265 (holo YA; iso BR, K, SCA, WAG), Cameroon, South West Province, Mabeta-Moliwe, Dikulu Village [N4°05' E9°16'], alt. 30 m, trail along seashore to west of Dikulu Village, 9 March 1995.

Etymology. *nigra* (black) the petals are almost black in colour: 'black flower'.

Shrub or tree 2–5(–15) m tall, glabrous, without resin. *Bark* dark brown or grey, smooth, outer slash pink to orange, inner cream; branching decussate with flattened sprays of leaves. Young shoots terete to slightly flattened at nodes, ferruginous, smooth with fine striation, older twigs with grey sometimes gnarled bark. *Leaves* simple, opposite; petiole 0.7–1.7 cm long, often deeply striate and drying darker than both stem and midrib; blade coriaceous to subcoriaceous, 23–43 by 6–16 cm, narrowly elliptic to oblong, acumen 0.8–1.5 cm long, base rounded to obtuse; 16–22 pairs of secondary nerves looping 3–5 mm from the margin, whitish above, yellow or brown and very prominent beneath; margin slightly crenulate or sparingly serrate and revolute when dry. *Inflorescence* ramiflorous, fascicles of up to 8 flowers, glabrous; bracts triangular, 10.5 mm wide by 0.5–0.75 mm long; pedicels 1.1–1.4 cm long at anthesis. *Buds* globular to obovate, (1.5–)2.0–2.5 mm long. *Flowers* purple to purple-brown drying almost black, 4–6 mm diam; calyx 3.0–4.5 mm diam, sepals green to light orange-brown, highly unequal, the largest often twice the width of the smallest, elliptic, 1.0–3.0 by 0.75–1.5 mm, entire, free; petals semicircular to broadly obovate, imbricate, 3.0–4.5 by 2.0–3.0 mm, margin entire. *Disk* shallowly cupular, 1.7–2.5 mm diam, 0.2 mm thick, often white contrasting strongly with the black petals. *Stamens* with flattened filaments inserted on the inner wall of the cupular disc, 1.5 mm long, anther cells confluent, forming an obtuse angle. *Ovary* 3-lobed, 1.0–1.25 mm diam tapering to style 1.0–1.5 mm long, stigma punctiform, ovules 2 per locule, superposed. *Fruits* pyriform to narrowly ellipsoid often gibbous, 50–75 mm long when dried (100 by 35 mm in vivo, Cheek 3453) with blunt rostrum 10–15 mm long, orange to orange-red, waxy, warty and irregularly ridged exterior, fruiting pedicel 1.1–2.1 by 0.2 cm; (1–)2–3 white seeds surrounded by a translucent, gelatinous pulp.

Distribution & Ecology — High rainfall coastal areas of Cameroon and Nigeria. Disturbed, semi-disturbed or intact evergreen forest, 30–330 m altitude.

In the Ebo forest a species of mosquito was observed visiting several flowers of *S. nigra* in turn over five minutes, spending 5–10 seconds at each possibly to imbibe nectar and potentially effecting cross-pollination (Cheek pers. obs. 2006). The fruits are eaten by gorillas in the Campo Reserve (Webb & Bullock 654).

Representative specimens. CAMEROON, Centre Region, Ndanan 2, Ndanan 1 to Ndanan 2 forest to left of trail, *Darbyshire* 301 (K, WAG, YA), 30 Mar. 2004; Littoral Region, Ebo Proposed National Park Njuma Research Station (nearest village Ndokbagengue), *Xanthos* 230 (K), 26 May 2010; *Xanthos* 140 (K), 1 Apr. 2010; Ebo Proposed National Park Bekob, *Tchiengue* 2450 (K, YA), 14 Feb. 2006; *Tchiengue* 2532 (K, YA), 17 Feb. 2006; Southwest Region, Moliwe Makota River watershed, *TD Watts* 249 (K, SCA, YA), 29 Apr. 1992; Mabeta-Moliwe Reserve, Southern base line, *Sunderland* 1145 (K, SCA, YA), 24 Mar. 1992; Mabeta-Moliwe Reserve, Southern base line, c. 700 m, *Cheek* 3453 (K, SCA, YA), 2 July 1992; Bimbia 4 km SE Limbe (TB), *Baker*

277 (K, SCA, YA), 5 Aug. 1993; Dikulu, Mangrove stream between road and mangroves at top of beach, *Cable* 1370 (K, SCA, YA), 26 Feb. 1995; Liwenyi Forest around the Likenge village, *Tchouto* 516 (K, SCA, YA), 18 Mar. 1993; Limbe Patch of high forest close to coast near Victoria, *Brenan* 9590 (K), 6 Apr. 1948; Boa Mokoko Forest Reserve, Ekombe-Mofako, *Pouakouyou* 82 (K, SCA), 4 June 1994; Mokoko, *Thomas* 10014 (K, SCA, YA), 20 May 1994; Bera Northern Korup F.R., *Olorunfemi FHI* 30665 (K), 3 July 1951. – NIGERIA, Edo state, Iyekoriwon District, Usonigbe Forest Reserve, *Daramola FHI* 72333 (FHI, K, MO), 5 Oct. 1973.

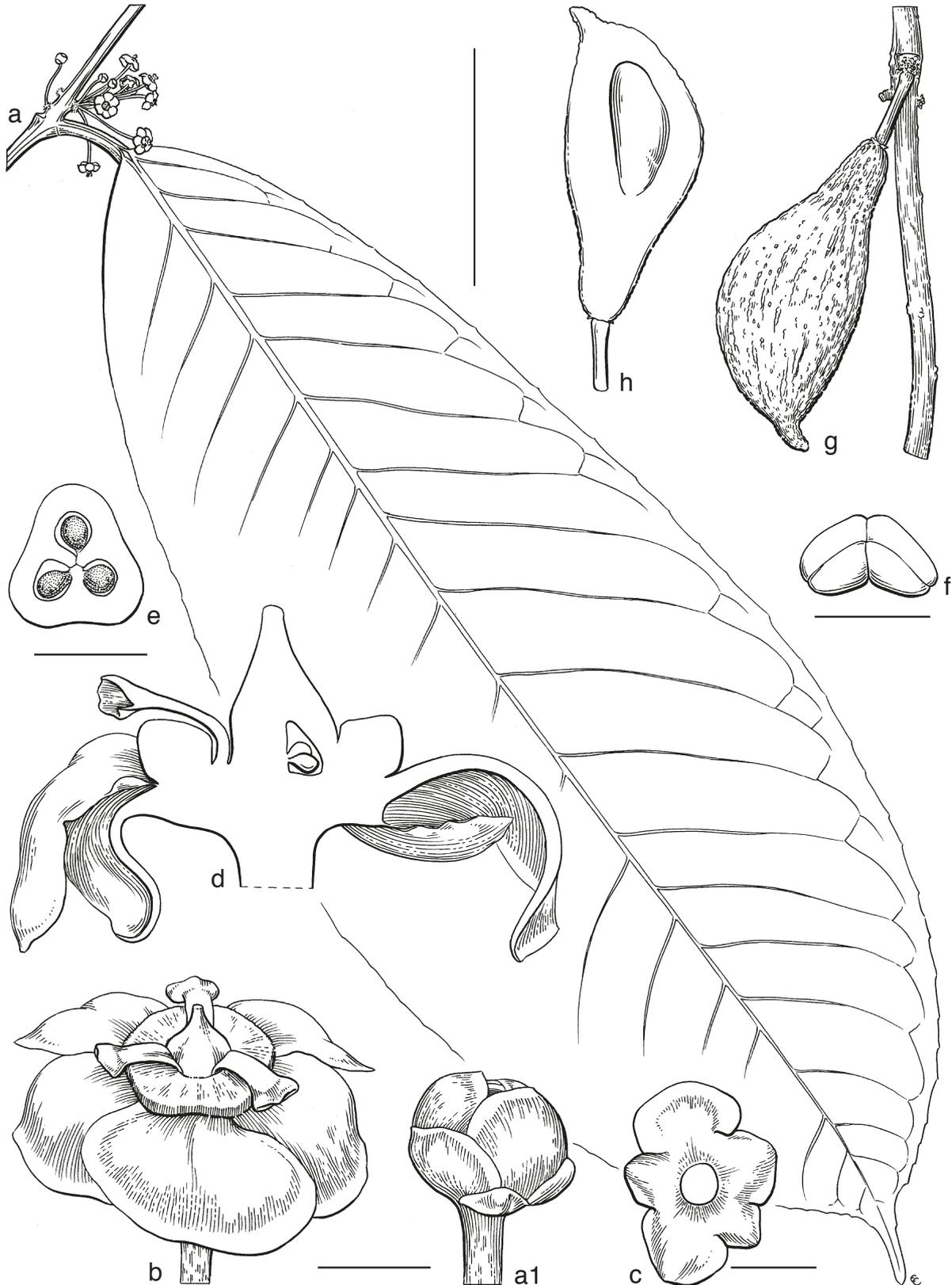


Fig. 3 *Salacia nigra* Cheek. a. Flowering habit; a1. bud; b. flower; c. calyx; d. longitudinal section of flower; e. transverse section of ovary; f. stamen; g. fruiting branch; h. longitudinal section of fruit (a, a1: *F Watts* 249; b–e: *Sunderland* 1145; g, h; *Cheek* 3453). — Scale bars: a, h = 5 cm; d–g = 1 mm; a1, b, c = 2 mm. — Drawn by Susanna Stewart.

Table 1 Characters of non-illanescent *Salacia* species.

Taxon	Maximum height	Leaf size	Pairs secondary nerves	Leaf margin	Acumen	Flowers	Fruit; maximum length
<i>S. lehmbachii</i> var. <i>lehmbachii</i>	5 m	elliptic, 8–22 by 4–10 cm	4–5	entire, revolute	triangular	pink to orange	obovoid, smooth; 6 cm
<i>S. loloensis</i> var. <i>loloensis</i>	4 m	narrowly elliptic to oblanceolate, 10–20 by 5–7 cm	9–10	entire	ligulate	yellow	obovoid to turbinate, smooth, often marbled; 5 cm
<i>S. loloensis</i> var. <i>sibangana</i>	2 m ?	narrowly elliptic to oblanceolate, 15–30 by 6–10 cm	14–16	undulate but not strongly toothed	ligulate	yellow?	fusiform, smooth; 7 cm
<i>S. manni</i>	3 m	elliptic, 8–20 by 5–7 cm	5–7	entire	acuminate	yellow	ovoid, smooth; 3 cm
<i>S. mayumbensis</i>	3 m	narrowly elliptic, 10–25 by 4–7 cm	11–13	serrulate to weakly toothed	ligulate	yellow to orange	variable, verrucose
<i>S. ndakala</i>	3 m	lanceolate, 14–22 by 4–7 cm	13–15	weakly toothed to serrulate	caudate	red to purple	unknown
<i>S. nigra</i>	5(–15) m	oblanceolate, 18–40 by 6–15 cm	12–20	entire to weakly toothed	ligulate	dark purple	pyriform to ellipsoid, gibbous, warty; 8–10 cm
<i>S. pallescens</i>	3 m	8–12 by 3–5 cm	6–8	serrulate	triangular	purple	globular, smooth marbled; 3 cm

Conservation assessment — Vulnerable (VU B2a,b(iii)) (IUCN 2012). The previous assessment of Critically Endangered given in Cable & Cheek (1998: xlvii) and referred to in Onana & Cheek (2011: 113) is lowered based on additional locations for the species. Eight distinct locations are indicated on Map 1 with an AOO of 80 km² using the 4 km² cell sizes advised by IUCN (2012). While *S. nigra* has secure populations in the Korup National Park and the proposed Ebo National Park, threats exist at all other locations. Usonigbe Forest Reserve viewed on Google Earth (imagery from 2008) is now 90 % agricultural fields and *S. nigra* is very probably extinct at this single known location in Nigeria. Slash-and-burn agriculture inside the Mefou National Park, very close to Yaounde, was recorded in 2004 (Cheek et al. 2011). At both the type location and the Campo Ma'an National Park and Technical Operations Unit illegal logging, iron ore mining and oil-palm plantation development are threats. The specimen location from Campo Ma'an lies outside the gazetted national park where logging concessions exist. Most of the specimen records of the species are from the eastern (Bimbia-Bonadikombo Community Forest, formerly Mabeta-Moliwe) and western (Mokoko-Onge) foothills of Mt Cameroon. The forest present at Bimbia-Bonadikombo has been extensively impacted by slash-and-burn agriculture since collections were made in the early 1990s (Cheek 1992). In the forest of the western foothills at Mokoko agriculture including oil-palm and petroleum exploration are current threats.

Notes — *Salacia nigra* is one of a group of closely related shrubs to small trees in Hallé's group 3 of Flore du Gabon (1987). This taxon was named as *Salacia* sp. A in The Flora of West Tropical Africa based on Brenan & Jones 9590; but Hallé subsequently identified this and other specimens as *S. loloensis* Loes. var. *sibangana* Hallé. Examination of specimens of *S. loloensis* var. *sibangana* shows a similarity in the large leaves, but the fruits to be smooth rather than warty, the flowers yellow rather than purple and the leaves smaller. (The similarity of the fruits in *S. loloensis* var. *loloensis* and var. *sibangana* support Hallé's association of the two taxa.) *Salacia nigra* fruits appear close to *S. mayumbensis* in this group of species, and we use this as the 'similar to' species in the diagnosis. *Salacia ndakala* R.Wilczek from Kivu is closely related to *S. mayumbensis*; no fruits are known from this species but it is likely to have the same warty fruit type.

A number of specimens in southern Cameroon do not fit neatly with the character matrix and may represent additional new taxa or regional variations. *De Wilde 2076* from south of Ebolowa is determined by Hallé as *S. mayumbensis* but is more weakly toothed than Gabonese specimens. *Webb & Bullock 654* from the Campo Reserve is similar. *Darbyshire 301* from near Yaoundé is also weakly toothed with larger leaves (30 cm long) and 14 secondary nerve pairs.

The listing in Tchoutou (2004: 152) of *S. loloensis* var. *sibangana* in the Campo Ma'an refers to a small woody climber and is probably a misidentification. We have not seen the collections on which the record is based.

The Smithsonian 50-ha plot in the Korup National Park inventories 564 individuals of what is undoubtedly this species (but with only 11 individuals with stems over 2 cm diam). Ranking 99th in frequency of occurrence in the list of species by number of individuals (Thomas et al. 2003)

Table 1 summarizes the taxa of true trees and small shrubs related to *S. loloensis*. *Salacia lehmbachii* Loes. (represented by *S. lehmbachii* var. *lehmbachii*), *S. pallescens* Oliv. and *S. manni* Oliv. are quite different in aspect from the other species but are included here for completeness.

We also give a key to all the non-illanescent species of central and west African *Salacias*. It is hoped this will be of use, but

care is necessary in that many (most?) of the lianescent species begin life as small sarmentous shrubs.

KEY TO NON-LIANESCENT SALACIA SPECIES OF TROPICAL AFRICA

1. Leaves chartaceous, finely toothed (c. 3 teeth per cm), to 12 cm long; mature fruits spherical, < 3 cm diam, marbled *S. pallescens*
1. Leaves more or less coriaceous, if toothed teeth < 3 per cm, some leaves > 12 cm long; mature fruits various, ≥ 3 cm long 2
2. Secondary veins < 9 pairs 3
2. Secondary veins 9 or more pairs 4
3. Secondary veins 4–5(–6) pairs, steeply ascendant usually to ≥ 1/2 length of leaf, leaf margin strongly revolute; stems winged or tuberculate; inflorescences pedunculate *S. lehmbachii*
3. Secondary veins 5–7 pairs ascendant at 45° to midrib, joining in < 1/2 length of leaf; leaf margins not or slightly revolute; stems not winged or tuberculate; inflorescences sessile *S. mannii*
4. Base of leaf sessile cordate to very shortly petiolate (< 5 mm long), leaves > 20 cm long, fruits turbinate to elongate and attenuate at ends (8 cm long) 5
4. Leaves petiolate, petioles ≥ 8 mm long; fruits various 6
5. Base of leaf strongly cordate, secondary nerves ascendant at 30° angle to midrib *S. diplasia*
5. Base of leaf subcordate to rounded, secondary nerves at 45–60° angle from midrib *S. dimidia*
6. Fruits globular or ellipsoid with a smooth surface, epidermis < 1 mm thick 7
6. Fruits elongate, gibbous or with constrictions, with a warty surface, epidermis > 1 mm thick 8
7. Leaves elliptic, 9–10 pairs secondary veins, scarcely ascendant, deeply impressed above, vein not visible, fruits ovoid to 5 cm diam. *S. loloensis* var. *loloensis*
7. Leaves narrowly elliptic to oblanceolate, 14–16 pairs secondary veins visible on adaxial side, fruits ovoid to turbinate to 7 cm long *S. loloensis* var. *sibangana*
8. Leaves oblanceolate to 40 cm long, margin entire or weakly toothed, 15–20 pairs secondary veins; flowers purple; fruits to 10 cm long *S. nigra*
8. Leaves narrowly elliptic to lanceolate to 25 cm long, margin with distinct teeth (c. 2 teeth/cm); < 15 pairs secondary veins; flowers yellow or red; fruits to 7 cm long 9
9. 11–13 pairs secondary veins strongly looping 5–8 mm from leaf edge, acumen long, ligulate; flowers yellow. — Cameroon to Eastern Congo. *S. mayumbensis*
9. 13–15 pairs secondary veins weakly looping near edge of leaf, acumen long but tapering; flowers red. — Kivu *S. ndakala*

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Steve Bachman advised on the conservation assessments.

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