



## Two new species of *Cryptolepis* (Apocynaceae: Periplocoideae) from Somalia, North-east Africa

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### Abstract

Two new species, *Cryptolepis nugaalensis* and *Cryptolepis somaliensis* are described. Both were discovered in arid environment in Somalia. Both belong to a unique group of xerophytic, mostly shrub-like species in the Horn of Africa, island of Socotra and southern Arabia, isolated from the rest of the genus.

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### 1. Introduction

*Cryptolepis* R. Br. comprises 29 species and, with the exception of four species (three in eastern Asia and one in Arabia), is an African genus. *Cryptolepis* species are generally thought of as tropical and sub-tropical climbers and among the better known species are *Cryptolepis apiculata* K. Schum., *Cryptolepis sanguinolenta* (Lindl.) Schltr. (African taxa), *Cryptolepis buchananii* Roem and Schult., *Cryptolepis grandiflora* Wight and *Cryptolepis sinensis* (Lour.) Merr. (Asian taxa). In the harsh environments of the Horn of Africa (Somalia), Socotra and southern Arabia (Yemen) a group of c. 12 species has evolved which are characterized by their shrub-like or even tree-like habit, often stunted growth and small mostly succulent leaves, usually with unique reddish mucros at the leaf blade apices. The two new species, described in the present article, belong to this group.

### 2. Materials and methods

External morphology was studied with an Olympus Stereo Microscope. As no fresh, or spirit, material was available, flowers from the herbarium specimens were rehydrated and

examined. Pollen from these flowers was acetolyzed (Erdtman, 1960), mounted in glycerine jelly, and sealed in paraffin wax for measuring their size under a Zeiss light microscope. Pollen and pollen translators were, furthermore, acetolyzed, air dried on stubs and coated with gold to examine their morphology under a Jeol Winsem 6400 microscope at 10 kV.

#### 2.1. Descriptions

##### 2.1.1. *Cryptolepis nugaalensis*

Venter and Thulin sp. nov. praebet affinitatem *Cryptolepis gillettii* Hutch. and E.A. Bruce fruticoso habitu, linearibus vel anguste obovatis foliis et floris gemma cuius corolla est helice torta longum apiculatum apicem. *C. nugaalensis* tamen habet sepala rubellis apicibus mucronatis, corollae lobos glabris apicibus et clavatis coronae lobis. In *C. gillettii*, e contrario, sepala sunt sine rubellis apicibus mucronatis, apices corollae lobi sunt fimbriati et coronae lobi sunt corniculati.

TYPE — Somalia, Nugaal: 5 km along track from Gaalogod to Garadeen, 07°36'N, 49°42'E, 100 m, 09/05/2001, Thulin, Abdi Dahir, Abdulkadir Khalid and Ahmed Osman 10504 (UPS, holo.; K, iso).

An erect branched shrublet of c. 0.5 m tall. *Roots* unknown. *Stems* woody, nodes enlarged, lateral shoots opposite; bark flaky, greyish-brown, glabrous, verrucose. *Leaves* opposite, sessile, glabrous; blade linear-obovate to narrowly obovate, 8–

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10 × 2 mm, succulent, main vein prominent below, secondary veins invisible; apex obtuse to retuse with fimbriate, reddish triangular mucro; base cuneate. *Inflorescences* axillary, 2- to 4-flowered, glabrous; peduncles 1–2 mm long, frail; pedicels 1–2 mm long, frail; bracts subulate, fimbriate. *Flowers* pentamerous. *Buds* with corolla elongate, ovoid-apiculate, lobes full turn helically twisted. *Sepals* narrowly triangular to narrowly ovate, 2–3 mm long, apex long attenuate with reddish mucro.

*Corolla* pale yellow, glabrous; tube 2 mm long, campanulate, without papillose spots below corona lobes; lobes linear, 7–9 × 1 mm, herbaceous, apex obtuse. *Corona* central within corolla tube; lobes crooked, clavate, c. 1 mm long. *Stamens* sub-sessile, c. 1 mm long; anthers hastate, apex apiculate, glabrous; pollen in decussate tetrads of 37.2–49.3 ( $x=42 (\pm 3.5)$ ) × 24.2–28.8 ( $x=27.1 (\pm 1.3)$ )  $\mu\text{m}$ , grains 3- to 4-porate, exine smooth. *Nectar glands* interstaminal, basal, pocket-like.

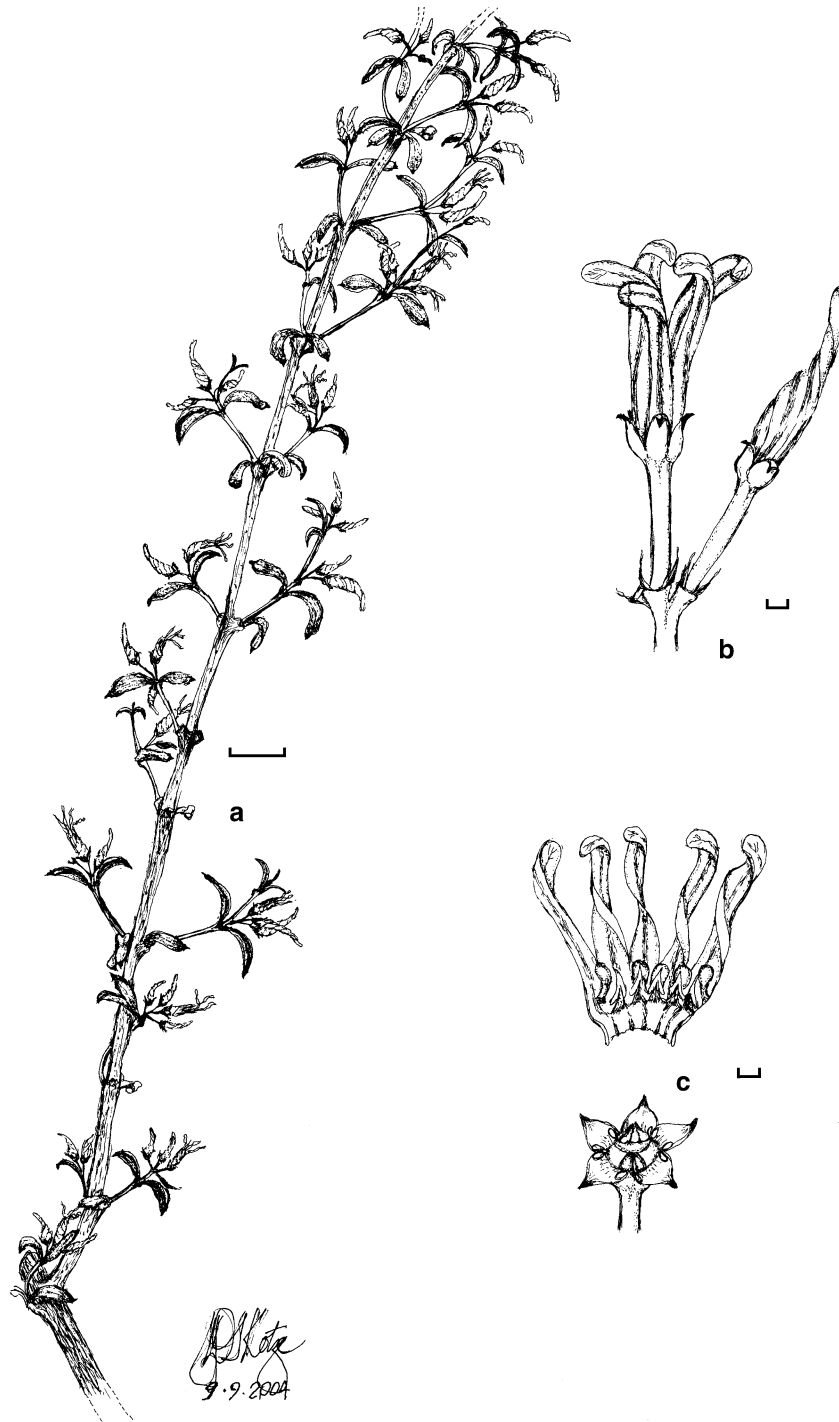


Fig. 1. *Cryptolepis nugaalensis*: (a) plant habit, (b) inflorescence, (c) flower with corolla opened, calyx and pistil separated from it. Scale bars: (a)=10 mm, (b and c)=1 mm (Thulin et al. 10504).

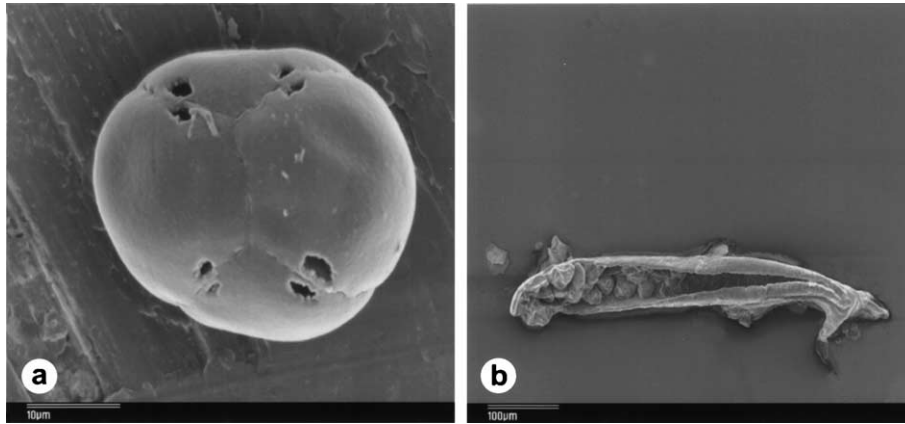


Fig. 2. *Cryptolepis nugaalensis*: (a) decussate tetrad, (b) translator. Scale bars: a=10 µm, b=100 µm (Thulin et al. 10504).

*Pistil* sub-inferior; ovary 2-celled, c. 0.5 mm long; style c. 0.5 mm long, dilating terminally; style head pentangular-deltoid, apex attenuate, c. 0.5 × 0.5 mm; pollen translators from upper surface of style head, spathulate, 367–419 µm long; translator receptacle concave, narrowly elliptic and sessile on viscidium. *Fruit and seed* unknown. (Figs. 1 and 2).

**2.1.1.1. Diagnostic characters.** *C. nugaalensis* shows affinity with *C. gillettii* in its shrubby habit, linear to narrowly obovate leaves and the flower bud of which the corolla is helically twisted into a long apiculate apex. However, *C. nugaalensis* has sepals with reddish mucronate apices, corolla lobes with glabrous apices and clavate corona lobes. By contrast, in *C. gillettii*, the sepals lack reddish mucronate apices, the corolla tips are fimbriate and the corona lobes are corniculate.

**2.1.1.2. Distribution and ecology.** *C. nugaalensis* is endemic to Somalia in North-east Africa (Fig. 3). The species is a

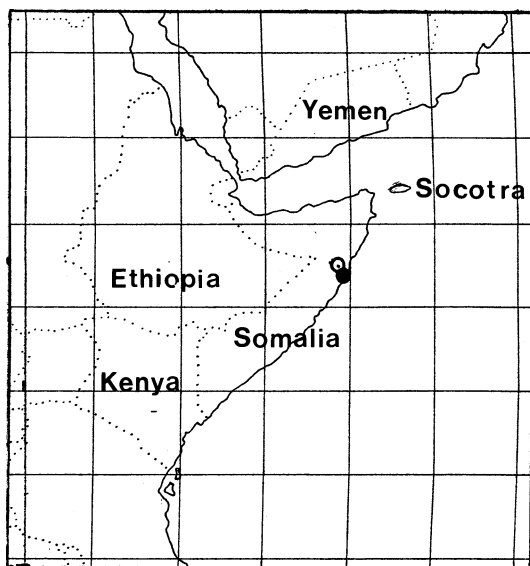


Fig. 3. Known distribution of *Cryptolepis nugaalensis* (●) and *C. somaliensis* (○) in North-east Africa.

component of scrubby vegetation of the northern region of the country; it was discovered in arid, open plains with shallow soil over limestone at an altitude of 100 m.

#### 2.1.2. *Cryptolepis somaliensis*

Venter and Thulin sp. nov. manifestat affinitatem *Cryptolepi stefanii* Chiov. et *C. yemenensi* Venter and R.L. Verh. fruticoso habitu, foliis succulentis, carnosae textura corollae et hirsutis antherae apicibus. *C. somaliensis* tamen habet coronam secundam rubellorum marsupiorum in corollae lobi sinibus, absentem in reliquis speciebus duabus.

**TYPE** — Somalia, Nugaal: 19 km along track from Gaalogod to Garadeen, 07°42'N, 49°38'E, 180 m, 09/05/2001, Thulin, Abdi Dahir, Abdulkadir Khalid and Ahmed Osman 10509 (UPS, holo.).

An erect branched shrublet of c. 0.4 m tall. *Roots* unknown. *Stems* with nodes enlarged, internodes terminally often sub-spinose when old, bark greyish-brown, glabrous, peeling, lateral shoots opposite, normal or stunted. *Leaves* opposite or fascicled, sessile, glabrous, blade oblong, 7–12 × 1–2 mm, succulent, only main vein visible, apex obtuse to retuse with reddish glabrous or hairy mucro, base obtuse. *Inflorescences* axillary, 1- to 3-flowered, glabrous; peduncles stout, c. 1 mm long; pedicels stout, c. 1 mm long; bracts triangular, fimbriate. *Flowers* pentamerous. *Buds* with corolla conical, 1/2-turn helically twisted. *Sepals* triangular, c. 1 × 1 mm, succulent, glabrous; margin fimbriate towards apex. *Corolla* succulent, yellow; tube 1.5–2 mm long, campanulate, with papillose spots below corona lobes; lobes narrowly triangular to narrowly ovate, 2–3 × 1 mm; apex obtuse to acute. *Corona* double; upper corona of reddish pockets from corolla lobe sinuses; lower corona hidden in corolla tube, lobes crooked, clavate, c. 1 mm long. *Stamens* c. 1 mm long, anthers hastate, apex shortly apiculate, hairy; pollen in decussate tetrads of 40.9–46.5 ( $x=43.1 (\pm 1.7)$ ) × 25.1–31.6 ( $x=28.6 (\pm 2.5)$ ) µm, grains 3- to 4-porate, exine smooth. *Nectar glands* interstaminal, basal, pocket-like. *Pistil* sub-inferior; ovary 2-celled, c. 0.5 mm long; style c. 0.5 mm long, dilating terminally; style head pentangular-deltoid with bifid apex, c. 1 × 1 mm; pollen translators from upper surface of style head, spathulate, 411–491 µm long; translator receptacle concave, narrowly

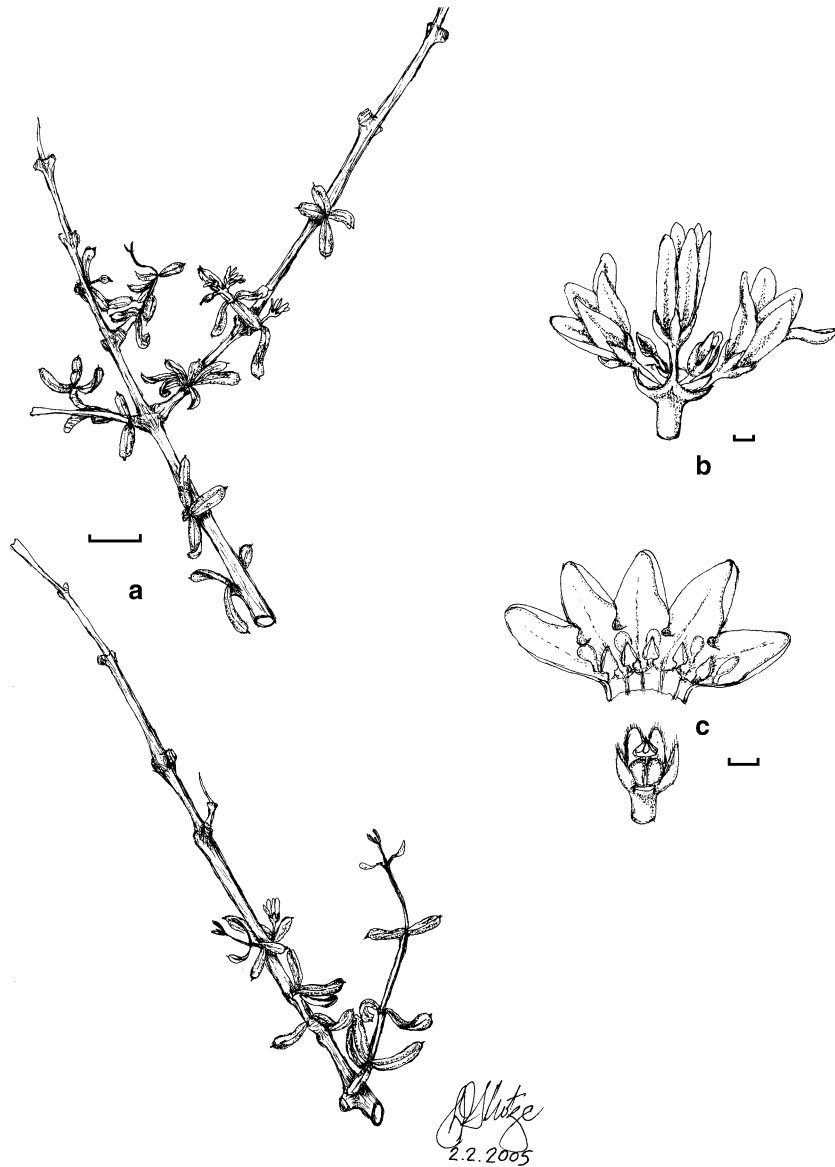


Fig. 4. *Cryptolepis somaliensis*: (a) plant habit, (b) inflorescence, (c) flower with corolla opened, calyx and pistil separated from it. Scale bars: (a)=10 mm, (b and c)=1 mm (Thulin et al. 10509).

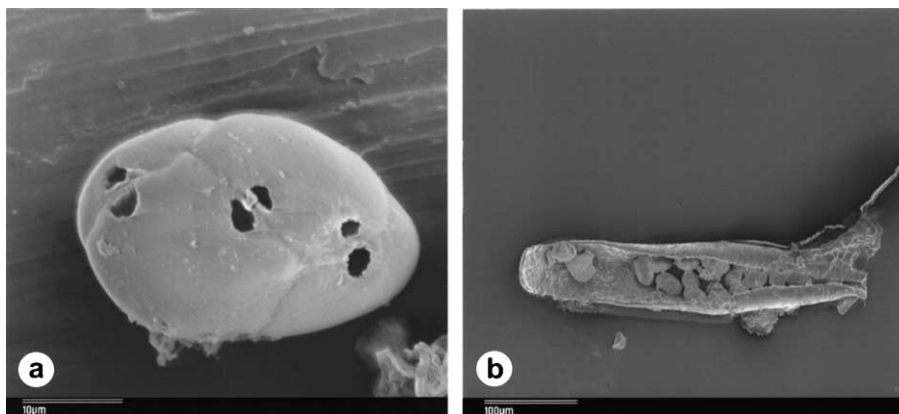


Fig. 5. *Cryptolepis somaliensis*: (a) decussate tetrad, (b) translator. Scale bars: (a)=10 μm, (b)=100 μm (Thulin et al. 10509).

elliptic and sessile on viscidium. *Fruit and seed* unknown. (Figs. 4 and 5).

**2.1.2.1. Diagnostic characters.** *C. somaliensis*, *C. stefaninii* and *Cryptolepis yemenensis* share a shrubby habit, succulent leaves, fleshy corollas and hairy anther apices. However, *C. somaliensis* is distinguished by a second corona of reddish pockets in the corolla lobe sinuses.

**2.1.2.2. Distribution and ecology.** *C. somaliensis* is endemic to Somalia in North-east Africa (Fig. 3). As is the case with *C. nugaalensis*, *C. somaliensis* is a component of xerophytic scrubby vegetation of the northern region of the country. It was discovered on an open plain with shallow soil over limestone at an altitude of 180 m.

### 3. Discussion

*C. nugaalensis* and *C. somaliensis* were found on the same day, only about 15 km apart, which must be a rare occurrence in the discovery of new plant taxa. This is probably an indication of how poorly the Somalia flora has been sampled, and it is thus possible that more new *Cryptolepis* species may be discovered in the Horn of Africa.

With the exception of *C. stefaninii*, all 12 species found in Somalia, Socotra and Arabia have leaves with characteristic reddish mucros, not found elsewhere in the genus. These species are distinctive woody scramblers or erect shrubs or trees, often with stunted lateral shoots and succulent leaves, characteristics uncommon to the genus.

While translator shape varies considerably within the Periplocoideae, sometimes even within the same genus, as in *Tacazzea* (Venter et al., 1990), the translators found in the different *Cryptolepis* species are conspicuously similar in structure, with concave narrowly elliptic receptacles which are sessile on the viscidia (Venter and Verhoeven, 1997 and personal observations). These concave narrowly elliptic translators were considered diagnostic of the genera *Curroria* Planch. ex Benth., *Mitolepis* Balf.f. and *Socotranthus* Kuntze which were recently sunk into *Cryptolepis* (Venter and Verhoeven, 1997). The translators of *C. nugaalensis* and *C. somaliensis* are no exception conforming to the structure typical of *Cryptolepis*.

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