

NORDIC JOURNAL OF BOTANY

Research

Ceropegia longirostris sp. nov. (Apocynaceae–Asclepiadoideae) from Ethiopia and Kenya

Mats Thulin, Michael G. Gilbert and Hassan Y. Kaariye

M. Thulin (<https://orcid.org/0000-0001-5970-8343>) ✉ (mats.thulin@ebc.uu.se), Systematic Biology, Dept of Organismal Biology, EBC, Uppsala Univ., Uppsala, Sweden. – M. G. Gilbert (<https://orcid.org/0000-0001-8451-6925>), Herbarium, Royal Botanic Gardens, Kew, Richmond, Surrey, England. – H. Y. Kaariye, Kebri Dehar, Ethiopia.

Nordic Journal of Botany

2021: e03416

doi: 10.1111/njb.03416

Subject Editor: Isabel Larridon

Editor-in-Chief: Torbjörn Tyler

Accepted 10 September 2021

Published 19 November 2021

The new species *Ceropegia longirostris* Thulin, M.G.Gilbert & Kaariye is described, illustrated and mapped. It is known from two localities, one on gypsum in the Somali National Regional State (Ogaden) in southeastern Ethiopia and one, based on a photographic record, from just east of Lake Turkana in northwestern Kenya. The new species is a member of *C.* sect. *Phalaena* H. Huber, and is distinctive by having flowers with the corolla glabrous outside and apically with a long narrowly clavate beak abruptly delimited from the rest of the corolla, and with each lobe of the corolla having a prominent wart-like blackish projection near the tip on the inside.

Keywords: Apocynaceae, *Ceropegia* sect. *Phalaena*, Ethiopia, gypsum, Kenya, taxonomy



Introduction

During field work in the Somali National Regional State (Ogaden) in eastern Ethiopia in May 2006 and February 2007, two of us (MT and HYK) found a distinctive new species of *Ceropegia* L. in a small outcrop of gypsum east of Kebri Dehar. The species was subsequently described as *C. gypsophila* Thulin (2009). However, another species of *Ceropegia* was also seen in the same locality, but this was not in flower at the time and was left unidentified.

More than 10 years later, HYK sent images to MT from the locality, now with flowering plants of both *Ceropegia gypsophila* and the unidentified species. This latter plant was judged by MT to be another new species, and HYK subsequently collected a small sample of flowers and leaves in spirit that was sent to MT.

MT, in turn, informed MGG, author of the account of *Ceropegia* in Flora of Ethiopia and Eritrea (Gilbert 2003), about this plant and passed on one of the images of it. MGG replied that he recognized the plant, not from Ethiopia, but from images that had been sent to him by the late Francis H. Brown, a geologist who had found it in June, 2012, in connection with archeological work near Ileret in northwestern Kenya. This species, now known from two localities quite far apart, one in Ethiopia and one in Kenya, is described below as *C. longirostris*. Francis Brown's collections are



www.nordicbotany.org

© 2021 The Authors. Nordic Journal of Botany published by John Wiley & Sons Ltd on behalf of Nordic Society Oikos

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

normally found in EA (Polhill and Polhill 2015), but no corresponding specimen from Ileret could be traced there in July 2021 (Mutuku Musili, pers. comm.). The Kenyan record of the species is therefore based on photographs only.

***Ceropegia longirostris* Thulin, M.G.Gilbert & Kaariye, sp. nov. (Fig. 1–3)**

A species that differs from *Ceropegia somalensis* Chiov. by having a corolla that is glabrous outside (versus shortly and densely pubescent all over the outer surface), 7–8 mm

(versus 12–16 mm) wide at the mouth, with wart-like projections ca 1.3 mm long on the inside of the corolla lobes below their point of fusion (versus sometimes having smaller or rudimentary knobs), the lobe margins recurved and auriculate at the sinus (versus flat), and with the tips of the corolla lobes twisted together or closely cohering to form a narrowly clavate, 16–20 mm long beak that is abruptly delimited from the rest of the corolla and sometimes more or less geniculate at the base (versus a beak more gradually delimited and loosely twisted above to form a



Figure 1. *Ceropegia longirostris* sp. nov. at type locality (A) flower with beak of corolla bent at the base and curved, (B) flower with beak upright and straight, (C) detail of flower showing blackish wart-like projections on inside of corolla lobes and abruptly delimited beak. Photographs by Hassan Y. Kaariye.

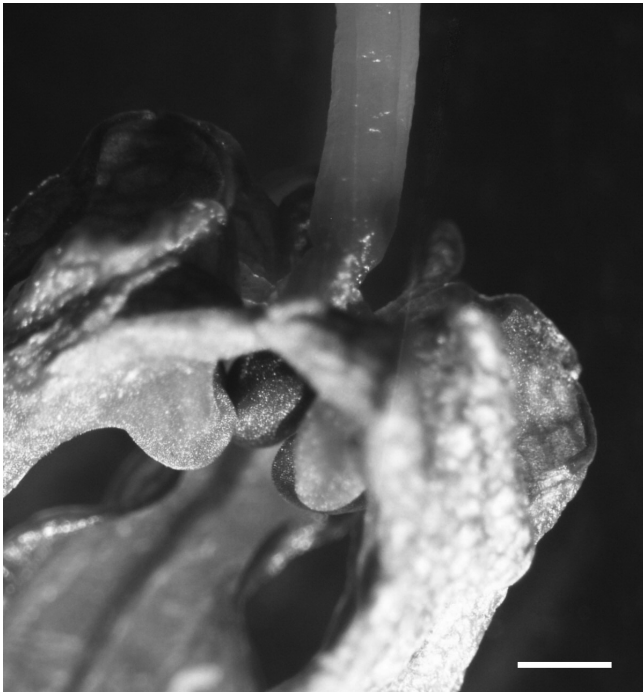


Figure 2. *Ceropogia longirostris* sp. nov. Corolla opened up to show wart-like projections on inside of corolla lobes just below their point of fusion. Scale = 1 mm. Photograph by Mats Thulin.

secondary upper ‘cage’ or occasionally uppermost part of corolla lobes absent).

Type: Ethiopia, Somali National Regional State (Harerge), 7 km E of Kebri Dehar, 6°44’45”N, 44°20’49”E, 18 Nov 2020, fl., Hassan Y. Kaariye 1 (holotype: ETH).

Description

Climber up to several meters long, with branched fibrous roots; stems succulent, terete, twining, 2–5 mm in diam., glabrous, glaucous, greyish green. Leaves opposite; petiole 8–15 mm long, cylindrical and with a furrow above, glabrous; blade lanceolate to narrowly ovate, 25–60 × 10–18 mm, cuneate to truncate or slightly cordate at base, acute to acuminate at apex, glabrous except for sparsely papillose margin, dark green, with midrib protruding beneath and lateral veins 3–5 pairs, margins flat or ± revolute. Flowers 5-merous in extra-axillary few-flowered umbel-like cymes; peduncle 5–10 mm long, glabrous; pedicel 7–8 mm long, ca 1 mm in diam., terete, glabrous, greyish green; bracts and bracteoles triangular-acuminate, 0.5–1.5 mm long, glabrous. Sepals linear-lanceolate, 3–4 mm long, ca 0.8 mm wide at the base, acuminate, ± appressed to base of corolla, glabrous. Corolla ascending, ± strongly curved near the base, glabrous outside, 37–40 mm long in total, lower part tubular, with lobes remaining fused at tips and with gaping openings in between, above point of fusion the lobes are ± tightly twisted together or closely cohering into a narrow beak that is abruptly delimited from the rest of the corolla and nearly half as long as the

total length of the flower; tube ca 18 mm long, pale greyish green with dull purplish blotches outside, particularly in upper expanded part; basal chamber ovoid, 4.5–5.0 mm wide and ca 5 mm long, not separated from rest of tube by an annulus, glabrous inside; tube above basal chamber with lower part cylindrical, 2.5–3.0 mm wide and ca 6 mm long, glabrous inside, its upper part funnel-shaped, ca 7 mm long, gradually widening to 7–8 mm at the mouth, pubescent with long white downwardly pointing hairs inside; corolla lobes ca 5 mm long and 4.0–4.5 mm wide at the broadly triangular base, longitudinally folded with recurved margins and slightly raised sinus, reflexed above point of fusion to form a depression around the apical extension, pale greyish green with dull purplish blotches outside and with purplish reticulum inside, with long white hairs along midrib near the base inside, each lobe with a blackish glabrous wart-like projection ca 1.3 mm long and 1 mm wide, directed downwards and inserted just below the point of fusion of the lobes; beak at top of corolla narrowly clavate, 16–20 mm long and ca 1.5 mm or occasionally up to 2 mm wide, dull purplish, glabrous, upright and straight or ± geniculate at the base and ± curved. Corona gynostegial, sessile; outer corona cup-shaped with spreading, broadly triangular, ca 1 mm long interstaminal lobes bifid at the apex, with sparsely pubescent margin; inner corona of linear ca 3 mm long staminal lobes, connivent over the style cap and with outcurved tips, glabrous. Follicles slender, widely divergent, ca 15 cm long (estimated from Fig. 3B); seeds unknown.

Distribution and habitat

Ceropogia longirostris is known from only two localities, one in Ethiopia and one in Kenya (Fig. 4) and some 900 km apart. The type locality in Ethiopia is situated east of Kebri Dehar in the Somali National Regional State (previously Harerge Region) in an area called Ceelxaar. The species is found in a small gypsum outcrop surrounded by silty or sandy ground, in a vegetation of open *Senegalia–Vachellia–Commiphora* bushland at an elevation of 500–550 m a.s.l. The locality is also the type locality of *C. gypsophila* Thulin (2009) and *Commicarpus ogadenensis* Thulin (2021), and other more or less local gypsum endemics found there are *Kleinia gypsophila* Lebrun & Stork and *Euphorbia suborbicularis* Thulin.

The locality in Kenya, Ileret just east of Lake Turkana, is situated within the Sibiloi National Park. This is an UNESCO World Heritage Site since 1997, famous for its important archaeological sites, such as Koobi Fora, with rich findings of fossils of early hominids. We have no direct information on the habitat of the Kenyan locality of *Ceropogia longirostris*, but presumably it is open bushland on gypseous ground at ca 400 m a.s.l. It is very likely that further populations of the species exist and it should be searched for in other areas of gypsum at similar elevations in southern Ethiopia and northern Kenya.

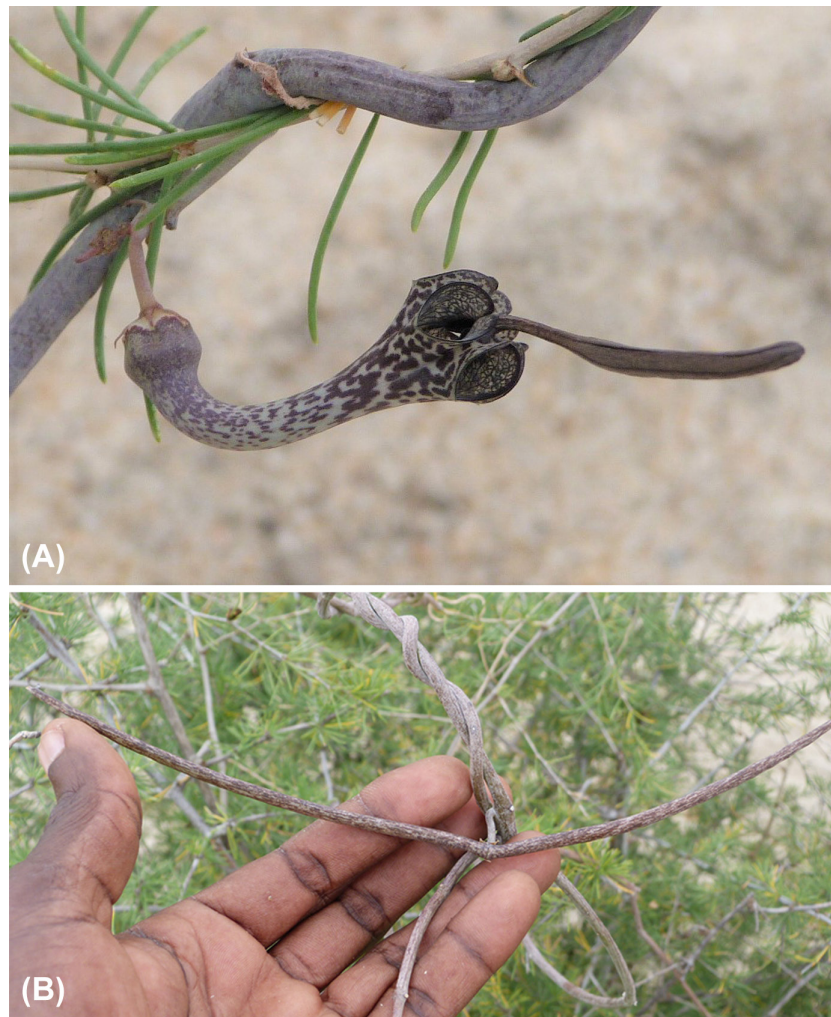


Figure 3. *Ceropegia longirostris* sp. nov. from the locality in Kenya. (A) flower, (B) fruit. Photographs by Francis H. Brown.

Similar species

Ceropegia longirostris is a member of *C.* sect. *Phalaena* H. Huber (Bruyns et al. 2017), a section that is very well represented in the Horn of Africa. The nearest relative is probably *C. somalensis* Chiov., a species originally described from southern Somalia (Chiovenda 1916), but also known from northern Somalia (Gilbert 2006), Ethiopia (Gilbert 2003), Kenya (Masinde 2012), as well as from Yemen (Bruyns 1989) and Saudi Arabia (Collenette 1999). *Ceropegia somalensis* has flowers with the tips of the corolla lobes often, but not always, twisted together into a clavate beak and, furthermore, the corolla lobes are sometimes furnished with a more or less prominent knob on the inside below their point of fusion (Masinde 2012: Fig. 69.3). The structure of the corona is also very similar in *C. somalensis* and *C. longirostris*. Flowers of *C. somalensis*, from a locality ca 170 km from the type locality of *C. longirostris*, are shown for comparison in Fig. 5A. This shows the general similarity in the shape of the corolla, but in this form of

C. somalensis, the knobs on the inside of the corolla lobes are missing.

Ceropegia longirostris differs clearly from the widespread and variable *C. somalensis* by having a corolla that is glabrous outside (versus shortly and densely pubescent all over the outer surface), 7–8 mm (versus 12–16 mm) wide at the mouth, with wart-like projections ca 1.3 mm long (Fig. 1C, 2) on the inside of the corolla lobes below their point of fusion (versus sometimes having smaller or rudimentary knobs), and with the tips of the corolla lobes more or less tightly twisted together or closely cohering to form a narrowly clavate (Fig. 1), 16–20 mm long beak that is abruptly delimited from the rest of the corolla (versus a beak more gradually delimited and loosely twisted above to form a secondary upper ‘cage’ (Fig. 5A) or occasionally uppermost part of corolla lobes absent). There is also a distinct difference in colouration, with the flowers of *C. somalensis* always lacking any trace of the purplish colours of the new species. Finally, whereas *C. longirostris* seems confined to areas of gypsum, there is no

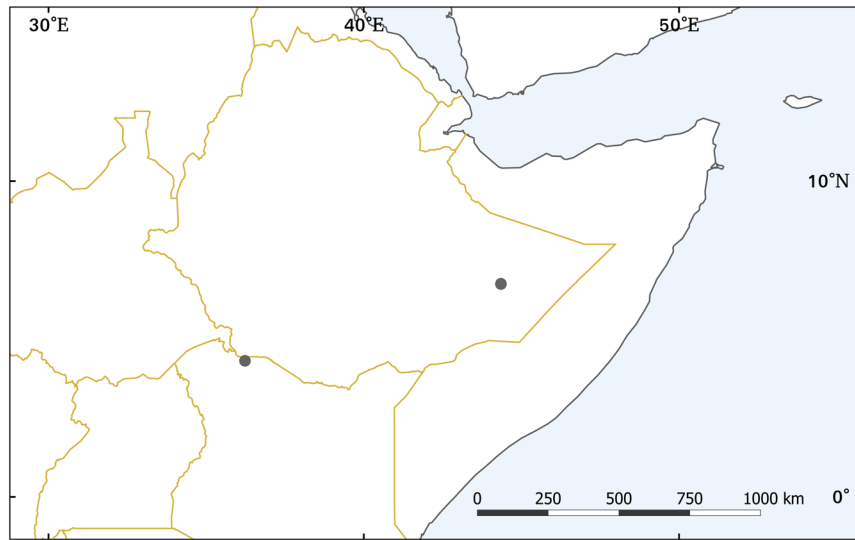


Figure 4. Map of Horn of Africa, showing distribution of *Ceropegia longirostris* in Ethiopia and Kenya.

indication that *C. somalensis* would have any association with gypseous ground.

Some forms of *Ceropegia lugardiae* N.E.Br., distributed from Kenya in the north to Namibia and Botswana in the south, can also have corolla lobes very similar to those of *C. somalensis* but like those differ from *C. longirostris* by the gradual transition into the base of the lobes in contrast to the very abrupt constriction seen in *C. longirostris*. *Ceropegia longirostris* also differs from most other members of sect. *Phalaena* by having the bases of the corolla lobes with their margins and the sinuses between them recurved. Nearly all other species have the margins of the bases of the corolla lobes and the sinuses between them flat. *Ceropegia zambesiaca* Masinde & Meve in Zambia does have very similar bases to

the corolla lobes, but their apices form a much shorter and rather indistinct beak.

Another possible close relative of *Ceropegia longirostris* in Ethiopia is the recently described *C. pseudorhynchantha* Bruyns (Bruyns et al. 2020), from areas of shallow soils overlying limestone at elevations of 1300–1600 m a.s.l. in Harerge, Bale and Sidamo Regions. *Ceropegia pseudorhynchantha* has the narrow tips of the corolla lobes twisted together into a clavate beak as in *C. longirostris*, and the structure of the corona is similar in the two species. However, the beak of the corolla in *C. pseudorhynchantha* is shorter and more gradually delimited than that in *C. longirostris*, and the basal inflation of the corolla tube is much more prominent.



Figure 5. Flowers of two presumed relatives of *Ceropegia longirostris*: (A) *C. somalensis*, from Ethiopia, near Degeh Bur, (B) *C. gypsophila*, plant co-occurring with *C. longirostris* at type locality. Photographs by Hassan Y. Kaariye.

Finally, also *Ceropegia gypsophila*, the species that co-occurs with *C. longirostris* at the type locality, has corolla lobes that form a beak at the tip and a corona structure similar to that in *C. longirostris*. However, *C. gypsophila* has a very different, parachute-like corolla (Fig. 5B), without wart-like projections below the point of fusion of the corolla lobes, but instead with an umbrella-like structure on the inside of the corolla roof formed by five, stalked, ovate, fleshy lobes. The parachute-like corolla of *C. gypsophila* much resembles that of *C. sandersonii* Decne. ex Hook.f. in southern Africa, and these two species were believed to be close relatives by Thulin (2009). However, the similarity is superficial and, whereas *C. gypsophila* is a member of *C. sect. Phalaena*, *C. sandersonii* is currently placed in *C. sect. Radicantiores* Bruyns (Bruyns et al. 2017).

Additional record

Kenya, Marsabit County: near Ileret, Jun 2012, fl. and fr., F. H. Brown, photographic record (Fig. 3).

Acknowledgements – We are indebted to Brook Kassa, Ulla Andrén and Håkan Pohlstrand for logistic help and to Anders Larsson for assistance with the map.

Funding – There is no funding to be reported for any of the authors.

Author contributions

Mats Thulin: Conceptualization (lead); Data curation (lead); Investigation (lead); Resources (equal); Visualization (equal); Writing – original draft (lead); Writing – review and editing (lead). **Michael G. Gilbert:** Conceptualization (supporting); Data curation (supporting); Investigation (supporting); Resources (equal); Visualization (equal); Writing – original draft (supporting); Writing – review and editing (supporting). **Hassan Y. Kaariye:** Investigation (supporting);

Resources (equal); Visualization (equal); Writing – original draft (supporting).

Data availability statement

Apart from herbaria deposits there are no new data in this publication.

References

- Bruyns, P. V. 1989. Studies in the Flora of Arabia XXIV: the genus *Ceropegia* in Arabia. – Notes R. Bot. Gard. Edinb. 45: 287–326.
- Bruyns, P. V. et al. 2017. A revised, phylogenetically-based concept of *Ceropegia* (Apocynaceae). – S. Afr. J. Bot. 112: 399–436.
- Bruyns, P. V. et al. 2020. New species of *Ceropegia* (Apocynaceae) from the Horn of Africa. – Phytotaxa 441: 195–202.
- Chiovenda, E. 1916. Risultati scientifici della missione Stefanini-Paoli nella Somalia Italiana, 1. Le collezioni botaniche. – Galletti e Cocci, Firenze.
- Collenette, S. 1999. The *ceropegias* of Saudi Arabia. – Br. Cact. Succ. J. 17: 181–187.
- Gilbert, M. G. 2003. *Ceropegia*. – In: Hedberg, I. et al. (eds), Flora of Ethiopia and Eritrea, vol. 4. The National Herbarium, Addis Ababa and Dept of Systematic Botany, Uppsala, pp. 158–169.
- Gilbert, M. G. 2006. *Ceropegia*. – In: Thulin, M. (ed.), Flora of Somalia, vol. 3. R. Bot. Gard. Kew, pp. 168–173.
- Masinde, S. 2012. *Ceropegia*. – In: Beentje, H. J. (ed.), Flora of tropical East Africa, Apocynaceae (part 2). R. Bot. Gard. Kew, pp. 220–291.
- Polhill, D. & Polhill, R. 2015. East African plant collectors. – R. Bot. Gard. Kew.
- Thulin, M. 2009. New species of *Caralluma* and *Ceropegia* (Apocynaceae: Asclepiadoideae–Ceropegiae) from eastern Ethiopia. – Kew Bull. 64: 477–483.
- Thulin, M. 2021. Two new species of *Commicarpus* (Nyctaginaceae) from the Horn of Africa. – Nord. J. Bot. 39: e03115.