



## New country records for species of Boraginaceae and Lamiaceae in the Horn of Africa hotspot

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### Abstract

*Cystostemon heliocharis* (Boraginaceae), previously known from Yemen and Somalia, is reported from Ethiopia, and a photograph of the species is provided. *Trichodesma stocksii* (Boraginaceae), previously known from Pakistan, Iran, and Oman, is reported from Yemen, and a drawing based on a Yemeni collection is provided. *Clerodendrum hildebrandtii* (Lamiaceae), previously known from Somalia, Kenya, Tanzania, and Mozambique, is reported from Ethiopia, based on a photographic record. Distribution maps showing the total distribution of these three species are presented.

### Introduction

New country records, based on collections from respectively Ethiopia and Yemen, are provided below for *Cystostemon heliocharis* (Moore in Baker & Moore 1877: 68) Miller & Riedl (1982: 7) and *Trichodesma stocksii* Boissier (1856: 140), both Boraginaceae. A new country record for Ethiopia is provided for *Clerodendrum hildebrandtii* Vatke (1882: 536) (Lamiaceae), based on photographs. The new records are all within the Horn of Africa global biodiversity hotspot (Thulin 2004).

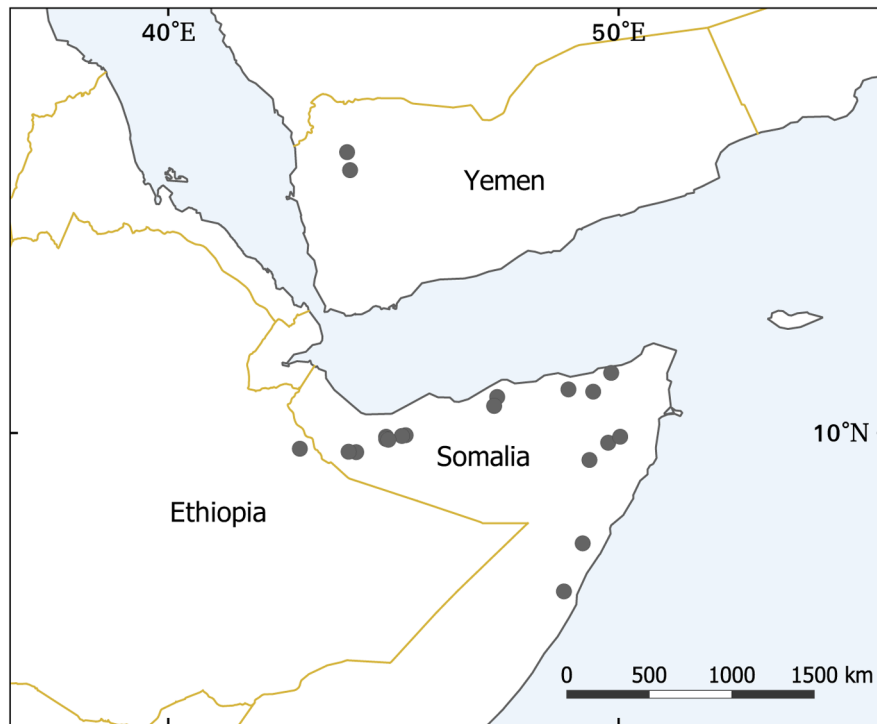
*Cystostemon heliocharis* (Moore in Baker & Moore 1877: 68) Miller & Riedl (1982: 7)

New specimen record:—ETHIOPIA. Oromia Region, Harerge: 10 km from Lefa Isa on road to Heregel, elev. 1825–1850 m, 12 November 1992, flowering and fruiting, *Kuchar & Mahdi Kidar 18428* (ETH!, UPS!).

This is a new record for Ethiopia (Fig. 1). The previously unidentified material was included among specimens sent from the South East Rangelands project in Ethiopia to UPS. The collection was made in open shrubland on a north-facing slope of a stony hill.

The genus *Cystostemon* Balfour (1884: 82) was revised by Miller & Riedl (1982), who recognized 13 species, distributed from the southwestern Arabian Peninsula and Socotra in the north, to Zambia and Angola in the south. Since then, three further species have been described from Angola and Zambia by Martins (1988a, b).

Miller & Riedl (1982) cited material of *Cystostemon heliocharis* from Yemen and Somalia, and provided a map of the distribution of the species. Thulin (2006a) treated four species, *C. heliocharis*, *C. intricatus* Miller & Riedl (1982: 11), *C. somaliensis* Miller & Riedl (1982: 8), and *C. virescens* Miller & Riedl (1982: 15) in Flora of Somalia, whereas Riedl & Edwards (2006) recorded two species, *C. ethiopicus* Miller & Riedl (1982: 12) and *C. virescens*, in Flora of Ethiopia and Eritrea. The revised map for *C. heliocharis* (Fig. 1) shows that the new Ethiopian record is in close vicinity of localities in northwestern Somalia (Somaliland). A photograph of a plant from a locality in northwestern Somalia is shown in Fig. 2.



**FIGURE 1.** Map of the Horn of Africa region, showing the distribution of *Cystostemon heliocharis*.



**FIGURE 2.** *Cystostemon heliocharis*, from northwestern Somalia (Somaliland), ca. 120 km from Erigavo to Burao, 18 Aug 2019. Photograph by Boris Vrškóv.

The type of *Cystostemon heliocharis* is from Somalia, and Miller & Riedl (1982) questioned whether the populations in Yemen should be given formal recognition, mainly on the basis of a difference in flower colour (corolla white or whitish in plants from Yemen, vs. mauve or pink in Somalia). However, the variation in the colour of the corolla is considerable. In Somali material, the corolla is mostly described as pale pink, but sometimes it is said to be pinkish white (*Thulin & Warfa 6046*, UPS), very pale pink (*Mooney 7630*, K), whitish (*Bally 9679*, K), or white (*Bally 10833*, K). Therefore, there seems to be no ground for a subdivision of the species based on flower colour. The colour of the corolla in the Ethiopian material is not indicated.

#### Key to the genus *Cystostemon* in Ethiopia and Somalia

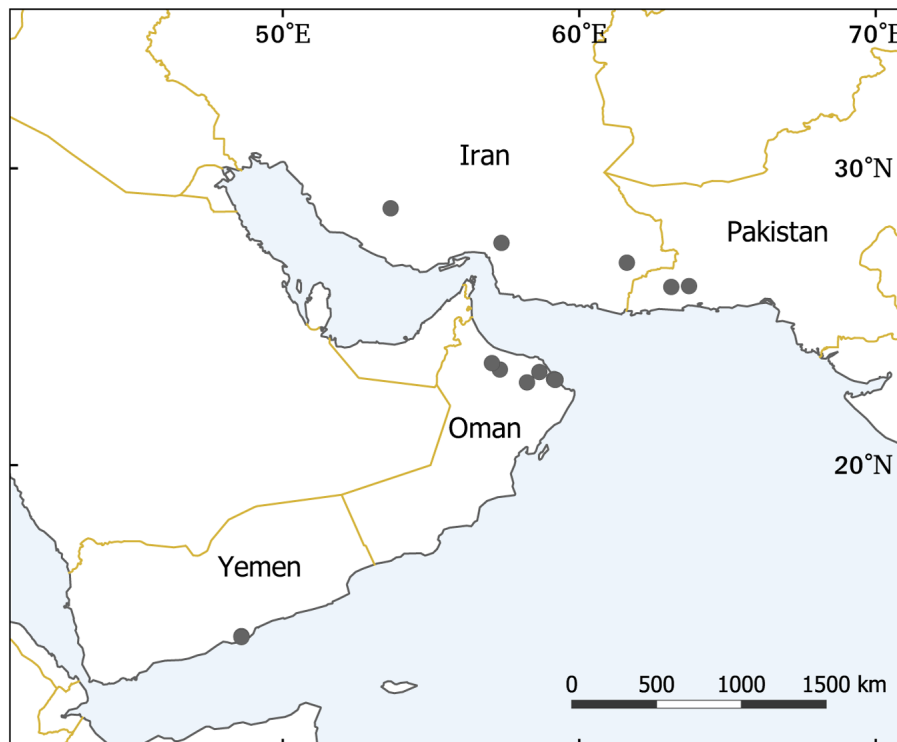
1. Hairs on inner surface of calyx-lobes 3–4 mm long..... *C. somaliensis*

- Hairs on inner surface of calyx-lobes shorter.....2
- 2. Leaves, at least some of them, more than 8 mm wide and/or 30 mm long .....3
- Leaves up to 8 mm wide and 30 mm long.....4
- 3. Bristles on stems spreading; corolla-lobes and anther-appendages distinctly curved upwards at the tip ..... *C. virescens*
- Bristles on stems antrorsely appressed; corolla-lobes and anther-appendages only slightly curved upwards at the tip.....*C. ethiopicus*
- 4. Calyx-lobes 5–9 mm long, up to 12 mm in fruit; anther-appendages 4–5 mm long.....*C. heliocharis*
- Calyx-lobes shorter, up to 5 mm long in fruit; anther-appendages 2.5–3.0 mm long .....*C. intricatus*

***Trichodesma stocksii* Boissier (1856: 140)**

Synonym:—*Trichodesma longipedicellatum* Rech.f. & Riedl in Riedl (1967: 222).

New specimen records:—YEMEN. Hadramaut: 20 km from As Sufal on road along Wadi Hajr, elev. 150 m, 21 November 1998, flowering and fruiting, *Thulin, Beier & Mohammed A. Hussein 9923* (E!, K!, UPS!); Middle Wadi Hajar, c. 15 km NW of Meyfah, elev. 150 m, 15 November 1999, flowering and fruiting, *Hein 6395* (B [digital image!], E!).



**FIGURE 3.** Map of southwestern Asia, showing the distribution of *Trichodesma stocksii*.

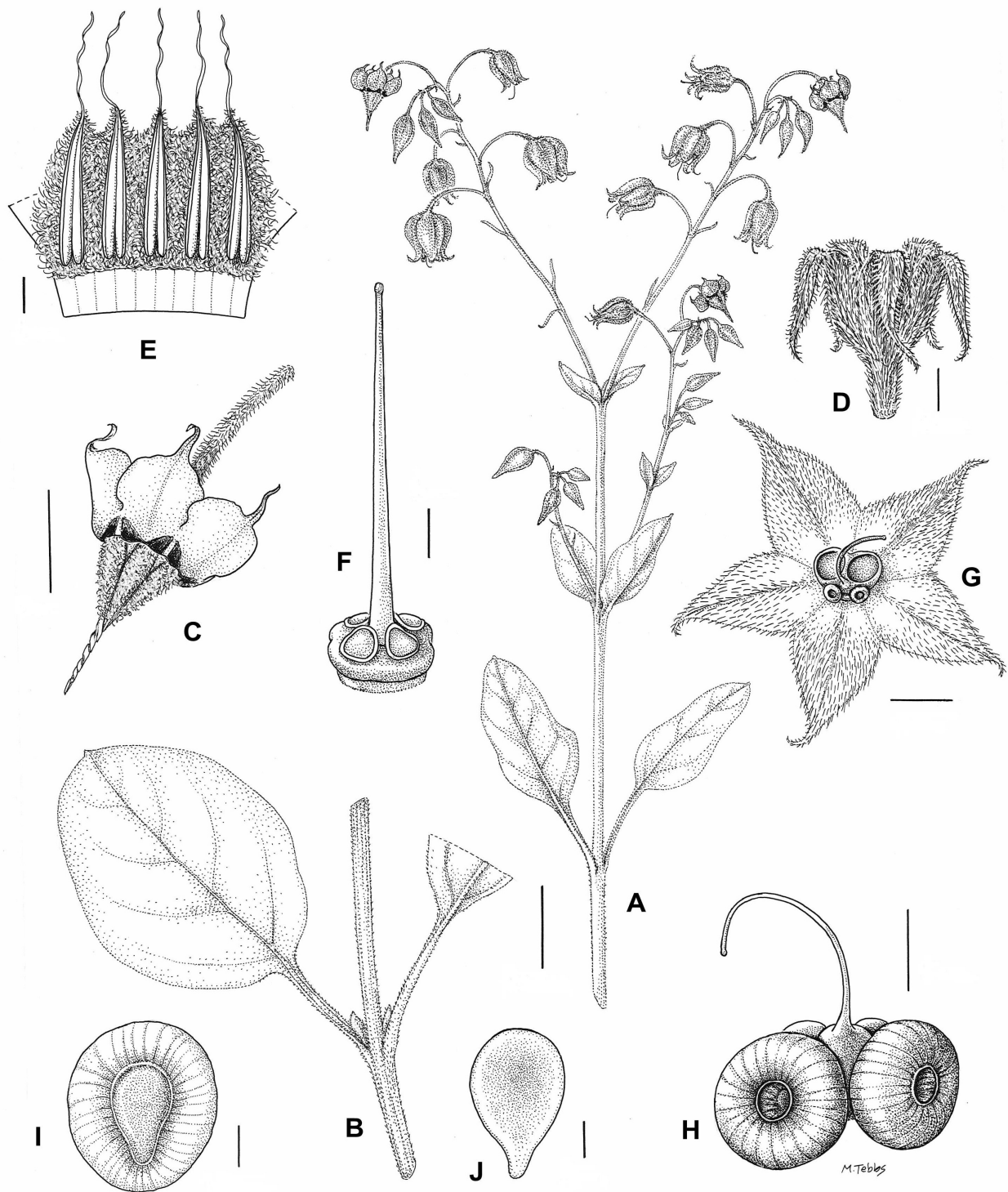
This is a new record for Yemen (Fig. 3). The two collections cited were both made on stony barren hillsides on black volcanic rocks. The vegetation in the surrounding area is sparse, but included several rare species, such as *Tephrosia hadramautica* Thulin (1994: 487), *Indigofera rubromarginata* Thulin (1996: 519), and *Ochradenus spartioides* (Schwartz 1939: 76) Abdallah (1967: 67). *Tephrosia hadramautica* and *O. spartioides* are endemic to southern Yemen, whereas *I. rubromarginata* is also found in Oman. A drawing based on the collection *Thulin et al. 9923* is shown in Fig. 4.

Two further specimens from Yemen have been seen that may represent *Trichodesma stocksii*, but are too young to be identified with certainty:

YEMEN. Lahij: Juhali Hills, 60 miles NW of Aden, elev. 600–1200 m, May 1904, flowering, *Wahab s.n.* (E!); Hadramaut: Mukalla to Moula Matar, elev. 300 m, 19 March 1964, flowering, *Rauh & Lavranos 13305* (K!).

*Trichodesma stocksii* was described from “regione Belutschistan” (Pakistan) based on a collection made by Stocks (Boissier 1856). Due to its nutlets with membranaceous and strongly inflexed margins, it was placed in *T.* sect. *Ommatocaryum* De Candolle (1846: 174). Boissier (1879) also cited material from Iran, as well as *Aucher-Eloy 5025* from “regno Mascate Arabiae” in today’s Oman. Since then more collections have been made in Iran, Pakistan, and Oman, and the species was keyed out in a “Key to the *Trichodesma* species recorded from the Arabian peninsula”

provided by Mosti & Selvi (2007). The species was not accounted for in Flora of the Sultanate of Oman (Ghazanfar 2015), but some collections from Oman were listed by Patzelt *et al.* (2020).



**FIGURE 4.** *Trichodesma stocksii*. A. Portion of plant with flowers and young fruits. B. Basal leaf. C. Flower. D. Calyx at anthesis. E. Corolla tube opened up to show stamens. F. Pistil. G. Fruiting calyx flattened out to show ovary with two undeveloped nutlets and with two nutlets detached. H. Two mature nutlets and two undeveloped nutlets at base of style. I. Nutlet from below showing attachment area. J. Seed. Scales 20 mm (A, B), 5 mm (C, G, H), 2 mm (D, I), and 1 mm (E, F, J). All from Thulin *et al.* 9923. Drawn by Margaret Tebbis.

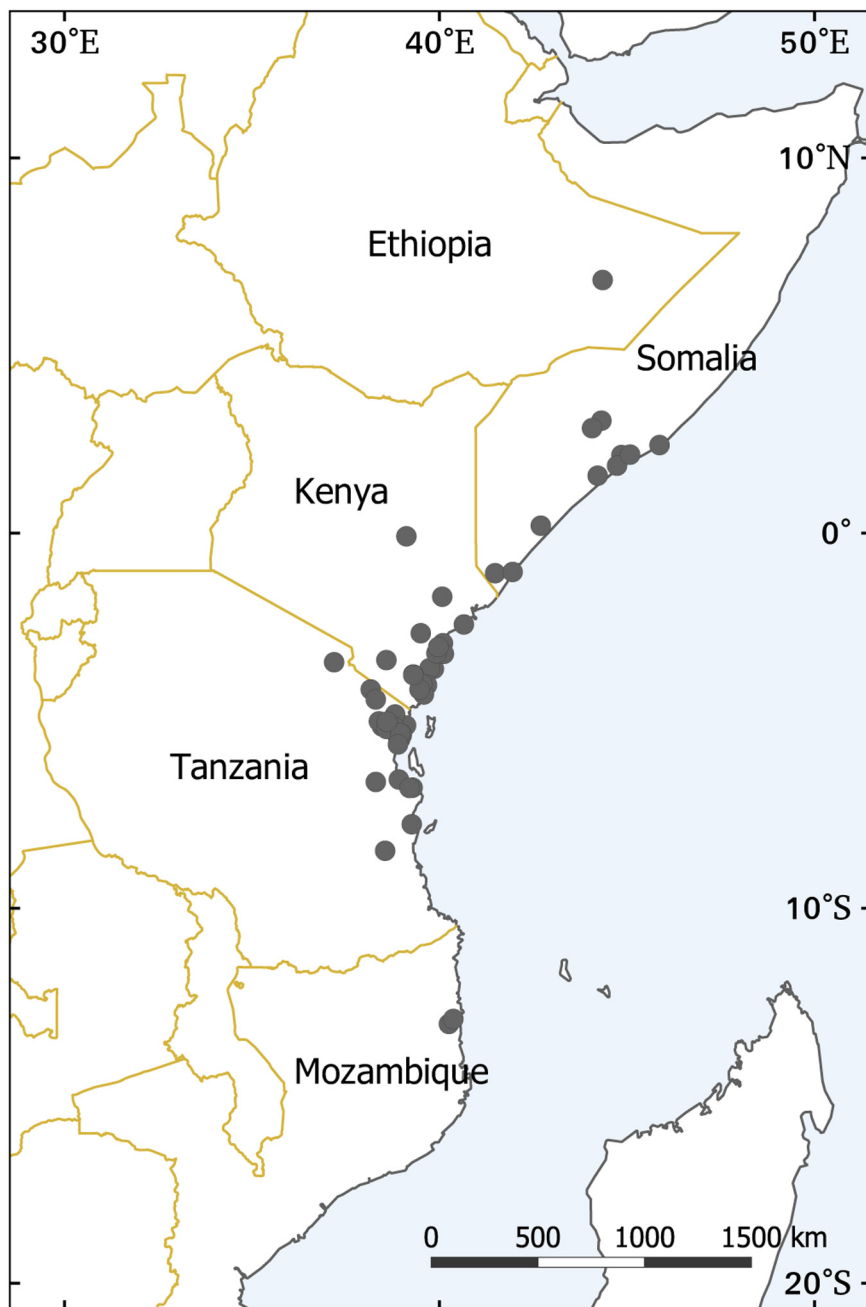
*Trichodesma longipedicellatum*, based on a collection from Pakistan (Rechinger & Riedl in Riedl 1967), was said to appear to be “only a tall form of *T. stocksii*, growing under better conditions” by Kazmi (1971). Subsequently, Nasir (1989) treated *T. longipedicellatum* as a synonym of *T. stocksii*, and the specimens treated as *T. longipedicellatum* in Iran by Mozaffarian (1985) were regarded as falling within the variation of *T. stocksii* by Khatamsaz (2002).

The two collections from Yemen cited above, apart from having nutlets with strongly inflexed and almost wheel-shaped margins (Fig. 4H), both have relatively large and broad leaves, some of which are distinctly petiolate (Fig. 4B). They resemble the type of *T. longipedicellatum* rather than the majority of specimens from Iran and Oman that tend to have narrower and almost sessile leaves, often with somewhat reflexed margins. A map of the total distribution of *T. stocksii* is provided in Fig. 3.

***Clerodendrum hildebrandtii*** Vatke (1882: 536)

New record information:—ETHIOPIA. Somali Region, Harerge: 7 km E of Kebri Dehar, Ceelxaar, elev. 500 m, 29 September 2018, flowering and young fruit, Hassan Yusuf Kaariye, photographic record.

This is a new record for Ethiopia (Fig. 5) based on unmistakable photographs (Fig. 6). Several shrubs, up to 5 m tall, were seen in open bushland at or near banks of a water pond and seasonal streams (Hassan Yusuf Kaariye, pers. comm.).



**FIGURE 5.** Map of eastern Africa, showing the distribution of *Clerodendrum hildebrandtii*.



**FIGURE 6.** *Clerodendrum hildebrandtii*, from Ethiopia, Somali Region, 7 km E of Kebri Dehar, Ceelxaar, 29 Sep 2018. **A.** Leafy shoot, showing calyces and bud. **B.** Young leafy shoot with more rounded leaves and with open flower and bud. Photographs by Hassan Yusuf Kaariye.

*Clerodendrum hildebrandtii* was originally described from Kenya (Vatke 1882), but is known also from Tanzania, southern Somalia (Verdcourt 1992, Thulin 2006b), and northern Mozambique (Fernandes 2005). Plants in Tanzania with pubescent young stems and leaves have been described as *C. hildebrandtii* var. *puberulum* Verdcourt (1992: 110; as “*puberula*”).

In Kenya and Tanzania *C. hildebrandtii* is known from various types of bushland and wooded grassland at elevations up to 900 m (Verdcourt 1992). In Somalia it is known from bushland and woodland on sandy or silty soil at elevations up to 230 m (Thulin 2006b), whereas in Mozambique it occurs in wooded grassland and bushland on sandy periodically inundated soils at elevations up to about 150 m (Fernandes 2005). The map in Fig. 6 shows that the Ethiopian record is some 450 km from the nearest localities in Somalia and is the northernmost one known for the species.

## Acknowledgements

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