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# Trichodesma cinereum Mosti & Selvi (Boraginaceae), a new species from Oman

Stefano Mosti & Federico Selvi

## Abstract

MOSTI, S. & F. SELVI (2007). *Trichodesma cinereum* Mosti & Selvi (Boraginaceae), a new species from Oman. *Candollea* 62: 205-210. In English, English and French abstracts.

The new species *Trichodesma cinereum* Mosti & Selvi (Boraginaceae) is described based on three collections from the region of Dhofar, Oman. It is distinguished from *Trichodesma boissieri* Post, perhaps the most closely related species, by a series of qualitative and quantitative characters concerning habit, indumentum, leaves, flowers and nutlets. *Trichodesma cinereum* is possibly endemic to Dhofar.

## Key-words

BORAGINACEAE – *Trichodesma* – Dhofar – Flora of Oman – Taxonomy

## Résumé

MOSTI, S. & F. SELVI (2007). *Trichodesma cinereum* Mosti & Selvi (Boraginaceae), une nouvelle espèce d'Oman. *Candollea* 62: 205-210. En anglais, résumés anglais et français.

La nouvelle espèce *Trichodesma cinereum* Mosti & Selvi (Boraginaceae) est décrite sur la base de trois collections de la région du Dhofar, Oman. Elle diffère de *Trichodesma boissieri* Post, l'espèce la plus voisine, par des caractères quantitatifs et qualitatifs concernant l'habit, l'indumentum, les feuilles, les fleurs et les nucules. *Trichodesma cinereum* est probablement endémique au Dhofar.

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The genus *Trichodesma* R. Br. (*Boraginaceae*) includes about 45 species mainly distributed in the arid to semidesertic habitats of tropical and subtropical Africa, Arabian peninsula, Asia and Australia (BRAND, 1921; VERDCOURT, 1991; BOULOS, 2000). It is morphologically characterised by the calathiform to broadly infundibular corolla with short tube, naked throat and patent to reflexed lobes cuspidate at apex. The stamens, typically exserted, have anthers usually pubescent outside that form a cone by long, aristate and spirally twisted appendages of the connective tissue.

The tribal relationships of *Trichodesma* are still unclear. Traditionally included in the *Trichodesmeae* Zak due to the pyramidal gynobase and to the marginally and/or dorsally more or less ornamented mericarps (BRAND, 1921; RIEDL, 1967). It has been considered by some authors (i.e. MILLER & RIEDL, 1982) in the separate tribe of *Trichodesmeae* along with *Caccinia* Savi. Molecular phylogenetic analyses have suggested that *Trichodesma* and *Caccinia* Savi form a clade which is sister to the rest of *Cynoglosseae* W. D. J. Koch (LÄNGSTRÖM & CHASE, 2002), but the tribal placement of this genus will remain uncertain (see for example HILGER & al., 2005) until a wider phylogenetic analysis on the whole complex will be performed.

Also at lower taxonomic level, the species of *Trichodesma* are still poorly investigated, and no recent revisions or monographic treatment, even for single geographic areas, have been yet published. Sources of information are mainly original descriptions, standard floras and BRAND (1921). This author basically followed CANDOLLE (1846) and subdivided the genus into six sections based on the morphology of the nutlets. In more recent times, good descriptions of the *Trichodesma* species from tropical east Africa are provided by VERDCOURT (1991).

During botanical researches in the region of Dhofar of Oman, aimed mainly at the study of the incense tree *Boswellia sacra* Flueck. (RAFFAELLI & al., 2003a, b), one of us (Stefano Mosti) collected plants of *Trichodesma* in the poorly investigated regions of Hayrun and Wanat.

The subsequent study of this collection showed that records of the same species from other localities of Dhofar already existed in Edinburgh (E) since at least twenty years, which were provisionally labelled as “*Trichodesma* sp. nov.” Most probably this is the species indicated by MILLER & MORRIS (1988) as “*Trichodesma* sp. nov.” in their list of Dhofar flowers and by GHAZANFAR (1992) as “*Trichodesma* sp. nov. aff. *boissieri*” in her floristic catalogue of Oman. A check of the recently published literature on *Trichodesma*, however, did not result in any taxon described from Oman or other nearby region corresponding to our collection and the specimens in E. The species is therefore described here with the name of *T. cinereum* Mosti & Selvi, in relation to the typically grey-tomentose indumentum covering the whole plant.

***Trichodesma cinereum* Mosti & Selvi, spec. nova** (Fig. 1)

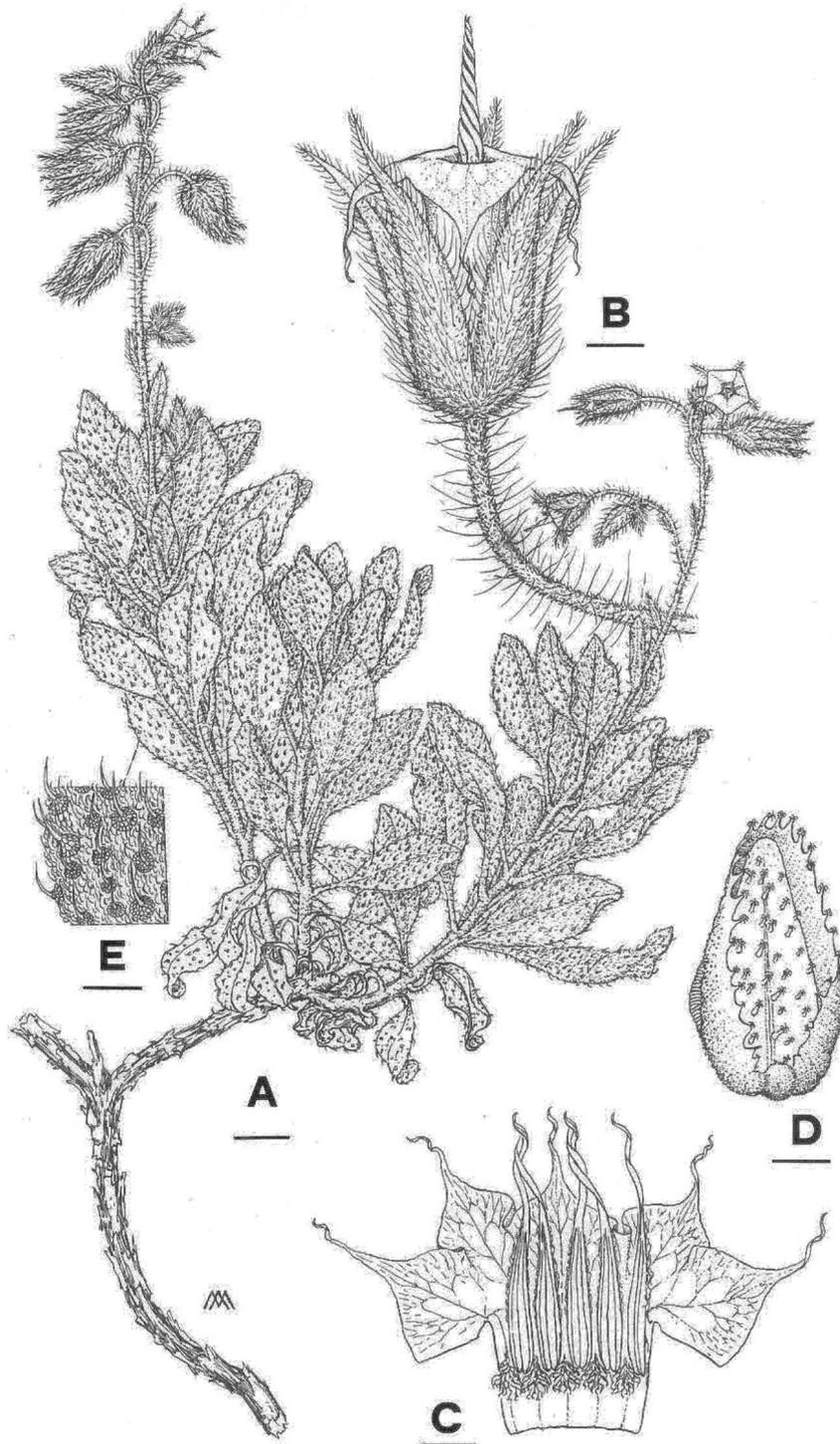
**Typus:** OMAN. Dhofar: pista di crinale Qaftawat-Wanat: qualche km a ovest di Wanat scendendo per 2 km ca. in direzione della costa, area rocciosa predesertica, alt. 1059 m. 17°01'55"N 53°44'58"E, 01.III.2007, M. Raffaelli, M. Tardelli, S. Mosti s.n. (holo-: FT!; iso-: G).

*Species affinis Trichodesmati boissieri* Post, a qua tamen differt statura minore; foliis minoribus, anguste elliptico-lanceolatis, distincte petiolatis; pedicellis floralibus brevioribus, dense lanatis; bracteis minoribus, anguste linearibus; calyce minore, dense lanato; corolla minore, albo-rosea; aristis antherarum glabris; marginibus nutularum dentatis, passim glochidiatis.

Perennial herb up to 30 cm, grey-tomentose, forming dense clumps with erect, woody branches flaking below. *Cauline leaves* densely packed along stems, the lower marcescent, subopposite, with petioles 0.7-1.2 cm long; blade narrowly ovate-elliptic, 2-3 × 0.7-1.2 cm, acute, entire, attenuate-cuneate at base, with a prominent main vein on the abaxial surface; both faces covered by a dimorphic indumentum formed by a dense layer of short, crispate hairs and sparser, longer setae with a finely papillose surface and a multicellular basal tubercle. *Stems* simple or poorly branched in the inflorescence, with cymes bearing 5-7 flowers nodding on pedicels c. 1 cm long; bracts linear 0.5-0.8 cm. *Calyx* densely lanate-villose, c. 1.2 cm long, divided almost to base in five narrowly triangular, acute lobes, rounded at base and finely pubescent inside. *Corolla* 1-1.2 cm in diam., whitish with pale pink margins and brown-yellowish centre; *limb* formed by reflexed lobes abruptly narrowed into an aristiform, twisted acumen c. 4 mm long; tube c. 2 mm long, with tufts of hairs at base of anthers; *stamens* exserted, anthers c. 1 cm long, shortly pubescent outside in the upper half, connective prolonged into spirally twisted, glabrous appendages forming an exserted cone; *style* filiform, c. 1.2 cm, stigma capitate-subglobose. *Nutlets* compressed-ovoid, 4-5 mm long, glochidiate on the dorsal face, with an erect-inflexed, erose-dentate and sparsely glochidiate margin.

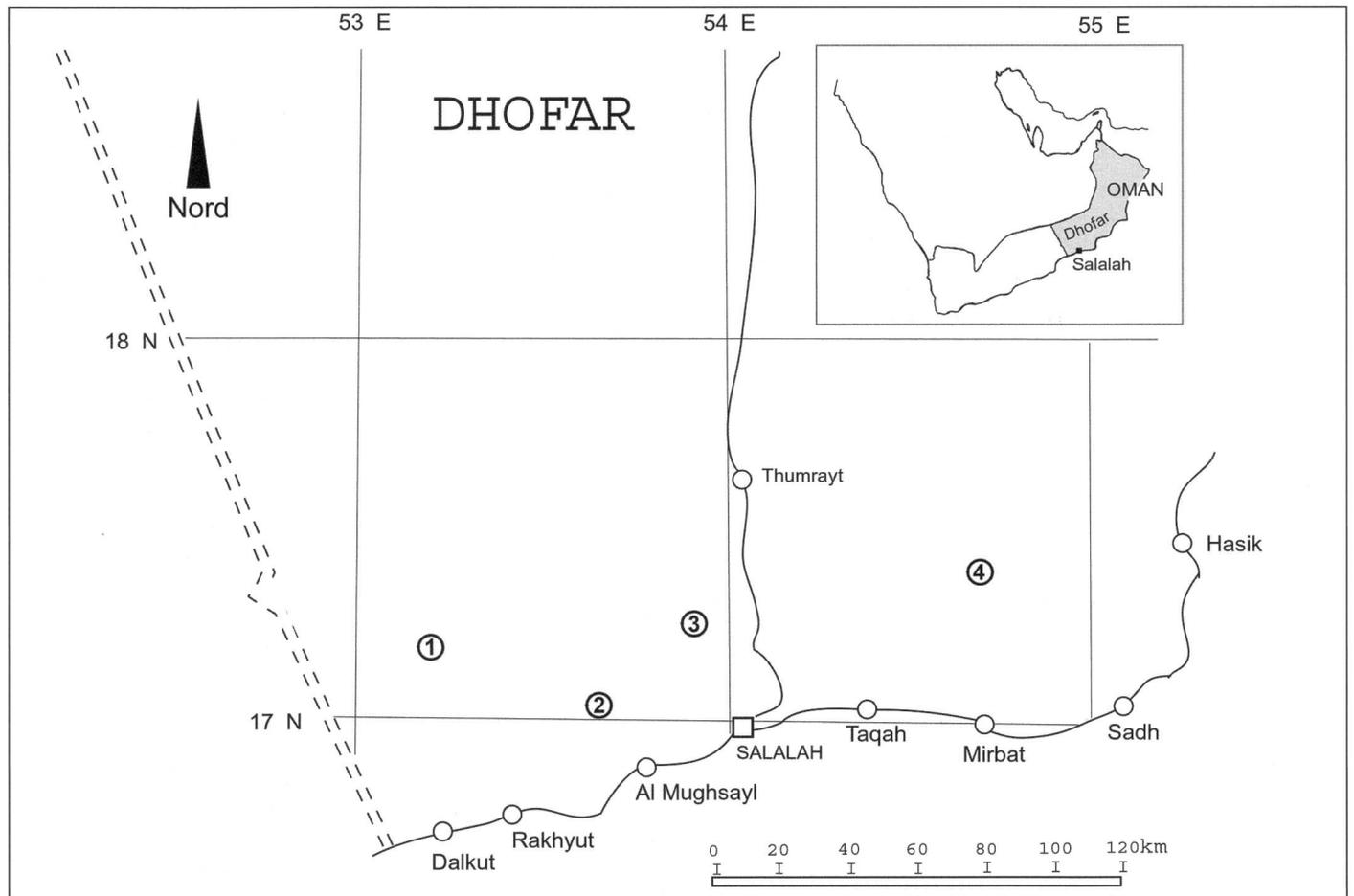
*Specimina visa.* – OMAN. Dhofar: 5.7 km on Ayun Turnoff, 17°20'N 54°02'E, 19.XI.1984, *McLeish* 371 (E); 4.4 km on Ayun Turnoff, dry wadi (north facing), 17°19'N 53°55'E, 23.III.1985, *McLeish* 506 (E); Wadi Andur, by pools of Andur, c. 600 m, 17°40'N 54°39'E, 26.IX.1984, *Miller* 6390 (E); Aybut-Hayrun road, desertic highland with hills and wadis in proximity of Hayrun, 700-850 m, 17°04'N 53°21'E, 13.IX.2002, M. Raffaelli, M. Tardelli & S. Mosti s.n. (FT).

*Distribution and habitat.* – As far as we know, the species is known from only the four collection localities cited above, i.e. Hayrun, Ayun Turnoff, Wadi Andur and surroundings of Wanat (Fig. 2). However, it is probably found elsewhere in Dhofar. In the *locus classicus* near Wanat the population was located in protected niches among large limestone rocks in a pre-desertic



**Fig. 1.** – *Trichodesma cinereum* Mosti & Selvi. **A.** Habit; **B.** Flower with peduncle; **C.** Open corolla; **D.** mericarpid in dorsal view; **E.** Magnification of the indumentum of the adaxial leaf surface.

[Raffaelli & al. s.n., FT] [Drawn by Anne Maury, Firenze] [Scale bars: **A:** 10 mm; **B, C:** 2.5 mm; **D, E:** 1 mm]



**Fig. 2.** – Collection localities (circles with numbers) of *Trichodesma cinereum* Mosti & Selvi in Dhofar, Oman. **1.** Hayrun; **2.** Wanat (type locality); **3.** Ayrun Turnoff; **4.** Wadi Andur.

mountain area with a very sparse vegetation of *Dracaena serrulata* Baker (*Agavaceae*), *Jatropha pelargoniifolia* Courbon (*Euphorbiaceae*) and *Euphorbia dhofarensis* S. Carter (*Euphorbiaceae*). Other associated species were the herbs *Heliotropium subspinosum* Thulin & A. G. Mill. (*Boraginaceae*), *Kohautia retrorsa* (Boiss.) Bremek (*Rubiaceae*), *Helianthemum* sp. (*Cistaceae*) and *Pulicaria nobilis* E. Gamal-Eldin (*Asteraceae*). The Wanat site represents the second finding for the latter species, which was known from only the type locality in Jebel Qara (GAMAL-ELDIN, 1981: 227-230). In the Hayrun area, *T. cinereum* was found in a subdesertic limestone highland between 700-850 m in association with *Fagonia bruguieri* DC., *F. schweinfurthii* Hadidi (*Zygophyllaceae*), *Tephrosia apollinea* (Delile) DC. (*Fabaceae*), *Indigofera* sp. (*Fabaceae*), *Stipagrostis* sp. aff. *hirtigluma* (Steud.) De Winter (*Poaceae*) and *Desmidorchis flavus* (N. E. Br.) Meve & Liede (*Apocynaceae*).

*Final remarks.* – *T. cinereum* does not show close affinities with any one of the four species of *Trichodesma* currently

recorded from Oman (GHANAFAR, 1992), i.e. *T. africanum* (L.) Lehm., *T. ehrenbergii* Boiss. (both sect. *Friedrichsthalia* (Fenzl) A. DC.), *T. hildebrandtii* Gürke (sect. *Acanthocaryum* Brand), and *T. stocksii* Boiss. (sect. *Ommatocaryum* A. DC.). These taxa belong to sections of *Trichodesma* with characters of indumentum and nutlets which are not found in *T. cinereum* (see key to the Arabian species below). Its position is possibly within sect. *Trachycaryum* A. DC., which was originally based on the presence of dorsally rugose nutlets without evident margin (CANDOLLE, 1846; BRAND, 1921; RIEDL, 1967). This group includes *T. incanum* (Bunge) DC., *T. molle* DC., both from the Irano-Turanian area, and *T. boissieri* Post from the Saharo-Arabian region. In these three species, as well as in *T. cinereum*, however, mature nutlets are provided with an erect-inflexed margin. *T. cinereum* is distinguished from the other three species by its nutlet margin which is conspicuously erose-dentate and provided with glochidia, while in the other three taxa the marginal glochidia are absent (cf. FEINBRUN-DOTHAN, 1978).

Dorsal glochidia are also found in *T. boissieri*, which is possibly the more closely related species occurring in Saudi Arabia but not recorded from Oman (FEINBRUN-DOTHAN, 1978; COLLENETTE, 1999). With respect to the latter species it differs in other qualitative and quantitative characters concerning both vegetative and reproductive structures (Table 1).

The tufts of long, crisp hairs which are found inside the tube at base of anthers are not mentioned for *T. boissieri* but they are present in *T. molle* and *T. incanum* of sect. *Trachycaryum* and also in other species of sect. *Trichodesma*, such as *T. zeylanicum* (Burm. f.) R. Br. and *T. indicum* (L.) Lehm. (VERDCOURT, 1991).

**Key to the *Trichodesma* species recorded from the Arabian peninsula**

1. Anthers almost totally enclosed in corolla-tube, not in a distinctly exerted cone (sect. *Serraticaryum* Verdc.) ..... *T. trichodesmoides*
- 1a. Anthers joined in a distinct and well-exserted cone ..... 2
2. Nutlets smooth with not raised and not spinolous margins (sect. *Trichodesma*)..... *T. zeylanicum*
- 2a. Nutlets ornamented and with undulate-dentate or glochidiate margins..... 3
3. Undersurfaces of leaves not tomentose, at most with sparse hairs ..... 4
- 3a. Undersurface of leaves grey-tomentose..... 6
4. Calyx lobes 1.5-3.0 cm long, cordate at the base (sect. *Acanthocaryum*) ..... *T. hildebrandtii*
- 4a. Calyx lobes 0.6-1.2 cm long, not cordate at the base (sect. *Friedrichstalia*)..... 5
5. Cauline leaves lanceolate or oblong; inflorescence terminal and axillary, narrowly paniculate; nutlets covered with minute uncinuate bristles ..... *T. africanum*
- 5a. Cauline leaves broadly ovate or suborbicular; inflorescence mostly terminal, broadly paniculate, lax; nutlets with minutely verruculose disc ..... *T. ehrenbergii*
6. Inflorescence subcorymbose; calyx lobes rounded-cordate at the base; nutlets with membranaceous and introflexed margins (sect. *Ommatocaryum*) ..... *T. stocksii*
- 6a. Inflorescence, base of the calyx lobes and nutlets not as above (sect. *Trachycaryum*) ..... 7
7. Cauline leaves sessile; length of calyx lobes 1.8-2.0 cm; appendix of anthers densely hairy; nutlets with erose-rugose margins ..... *T. boissieri*
- 7a. Cauline leaves petiolated (c. 1 cm); length of calyx lobes 1.0 – 1.3 cm; appendix of anthers glabrous; nutlets with dentate and glochidiate margins..... *T. cinereum*

**Table 1.** – Main differential characters between *Trichodesma cinereum*, *T. boissieri* and *T. molle* (sect. *Trachycaryum*).

Character	species		
	<i>T. molle</i>	<i>T. boissieri</i>	<i>T. cinereum</i>
Mean height of the plant [cm]	up to 50	up to 50	up to 30
Mean size of the mid cauline leaves [cm]	3-6 x 2-3	3-6 x 2-3	2-3 x 0.7-1.2
Shape of mid cauline leaves	broadly ovate-elliptic	broadly ovate-elliptic	narrowly elliptic
Petiole of mid caulin leaves [cm]	0.1-0.4	0.1-0.4	0.7-1.2
Indumentum of calix and flower pedicels	short, sparse	short, dense	long, dense
Inflorescence	narrowly paniculate	narrowly paniculate	simple or poorly branched
Bracts	ovate-lanceolate	ovate-lanceolate	linear
Length of flower pedicels [mm]	up to 35	up to 35	up to 12
Length of calyx lobes [mm]	18-20	18-20	10-13
Diameter of corolla limb [mm]	c. 20	c. 20	c. 11
Colour of corolla	pale blue	pale blue	whitish-pink
Appendix of the anthers	glabrous	densely hairy	glabrous
Margine of the nutlet	rugose to dentate	erose-rugose	dentate and glochidiate

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