Contributions to the flora of Jordan: new and interesting plants from Dana Nature Reserve, SW Jordan

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Abstract

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Rubia danaensis, *Micromeria danaensis*, and *Silene danaensis* from sandstone and limestone outcrops of the Dana Reserve, SW Jordan, are described as species new to science, illustrated, and compared with their closest relatives. The heterogeneous *Teucrium leucocladum* is subdivided into three subspecies and two varieties, of which subsp. *sinaicum*, subsp. *jordanicum* and subsp. *leucocladum* var. *glandulosum* are described as new to science. Five taxa, i.e. *Clypeola jonthlaspi* subsp. *microcarpa* var. *glabra, Hypericum sinaicum, Plantago sinaica*, *Veronica panormitana* subsp. *baradostensis*, and *V. polifolia* are new records for the 'Flora Palaestina' area, and seven taxa, i.e. *Alcea galilaea, Linum toxicum, Reaumuria negevensis, Saxifraga hederacea, Stachys zoharyana*, *Teucrium montbretii*, and *Typha elephantina* are new records for Jordan.

Introduction

In the course of floristic investigations in the Dana Nature Reserve, SW Jordan (see northern locality marked ✷ in Fig. 4), a few taxa not reported before from Jordan (see Al-Eisawi 1982) or the area covered by the "Flora Palaestina" (see Zohary 1966, 1972, Feinbrun-Dothan 1978, 1986, Feinbrun-Dothan & Danin 1991) as well as three hitherto undescribed species were found. Included are also four new records from an excursion to N Jordan. A gathering of *Teucrium leucocladum* initiated a closer study of this heterogeneous species in Jordan, Sinai, and Israel, and, as a result, this species is divided into three subspecies and two varieties. The investigated material is, unless otherwise stated, deposited in the herbarium of the Hebrew University of Jerusalem (HUJ).

Taxa new to science

Micromeria danaensis Danin **sp. nova** (*M.* sect. *Micromeria* = *M.* sect. *Piperella* Benth.) – Fig. 1.
Holotypus: Jordan, Edom, Dana Reserve, Wadi Barra area, 2 km SE of the visitor center, in crevices of smooth-faced white sandstone outcrops, 14.5.1996, *A. Danin 963013* (HUJ; isotypus: B).

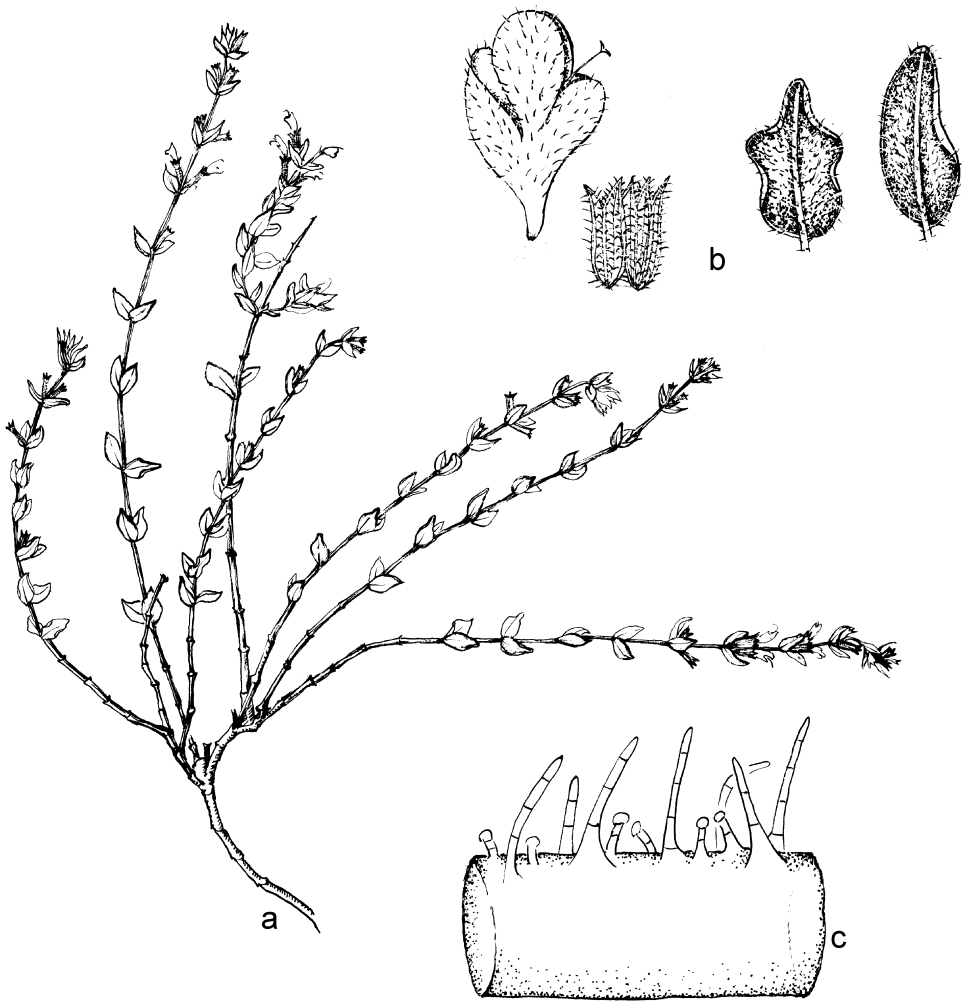

Fig. 1. *Micromeria danaensis* – a: flowering branch (×1); b: corolla, calyx, leaves (×5); c: stem indumentum (×20).

Affinis *Micromeria serbaliana* Danin & Hedge sed calicibus majoribus, verticillastris pauciflo-ribus, caulibus floriferis 1 mm diametro (nec 0.2–0.3 mm), pilis caulium 4–6 cellularibus (nec 2–3) atque 0.8–1.0 mm longis differt.

Suffrutex humilis multicaulis, omnino patule hirsutus, basi induratus. Caules grisei, e collo ramosi, tenues, 0.8–1 mm diametro, obtuse quadrangulares, 4–15(–20) cm longi, internodiis 3–12 mm longis, in tertia parte superiora floriferi, per totam longitudinem pilis simplicibus, longis, patulis nec non pilis glandulosis curtis dense tecti; glandulae magnae sessiles raro ad-sunt. Folia caulina brevissime petiolata, inferiora ovata, basi rotundata, apice acuta, 5–6.5 × 2.5–3 mm, margine distincte revoluta utrinque viridia, subtus costa mediana saepe indistincta et nervis lateralibus indistinctis, etiam superne nervis indistinctis, utrinque dense scabrido-hispida pilis numerosis simplicibus et glandulosis; glandulae magnae sessiles raro adsunt; folia supe-

Tab. 1. Differences between *Micromeria danaensis* and *M. serbaliana* (data on *M. serbaliana* from Danin & Hedge 1973).

Features	*M. danaensis*	*M. serbaliana*
Habit	loose-ascending	cushion-forming
Diameter of leafy stems	0.8–1.0 mm	0.2–0.3 mm
Height	10–15 cm	10 cm
Leaf size	5–6.5 × 2.5–3 mm	2-4 × 1–2 mm
Indumentum		
stems	hispid, with 4-6-celled hairs, the longest 1 mm, nearly equalling stem diameter; stalked glandular hairs present	hispid, with 1–3-celled hairs, 0.1–0.2 mm long
leaves	densely hispid with 4-celled and a few 2–3-celled hairs; many stalked glandular hairs present	densely hispid to scabrous throughout with mostly 1-celled and few 2-celled hairs; few stalked glandular hairs present
calyx	hispid, with 1–3-celled hairs; stalked and sessile glands present	hispid with 1–3-celled hairs; stalked and sessile glands present
corolla	hairy to the lower third of the corolla tube	hairy to the lower half of the corolla tube
Calyx teeth	2 subulate, 0.8 mm, and 3 triangular, 0.5 mm long	all triangular and 0.5 mm long
Calyx tube length	2.5–3 mm	2 mm
Flowers per verticillaster	2 (–6)	2–20
Bracteole length	1.5–2 mm	less than 1 mm
Distribution	SW Jordan, at 1200-1300 m	S Sinai, at 1400–2600 m

riora sensim angustiora, ovato-lanceolata vel lanceolata; folia floralia linearia flores calycesque subaequantia. Cymae pauciflorae, 1–2 mm pedunculatae, 1(–3)-florae. Bracteae minutissimae, subulatae, 0.5–1.5 mm longi. Pedicelli filiformes 0.5–2 mm longae. Calyx tenuiter tubulosus, 3.3–4 mm longus, distincte nervosus, pilis patulis provisus, nervis pilis eglandulosis simplicibus glandulosisque, et inter nervos glandulis sessilibus paucis vestitus; dentes calycum 5 inaequales, 2 subulati 0.8 mm longi, 3 triangulari 0.5 mm longi. Corolla lilacina, puberula, 4–5 mm longa; labium inferius punctis atropurpureis instructum, extus hispidum, pilis eglandulosis simplicibus numerosis et pilis glandulosis paucis. Nuculae ovatae, fuscae, 0.9–1 × 0.4–0.5 mm. Fl. Mai-Aug.

This and the following two species are named after their type locality, the Dana Reserve in SW Jordan.

Additional specimen seen
JORDAN: Edom, Dana Reserve, Wadi Barra area, 2 km SE of the visitor center, in crevices of smooth-faced white sandstone outcrops, 14.5.1996, *Danin 963603*.

Rubia danaensis Danin **sp. nova** – Fig. 2.
Holotypus: Edom, Dana Reserve, a limestone cliff above the visitor center, 13.5.1996, *Danin 962509* (HUJ; isotypi: B, E, K, W); paratypi (fruiting specimens): ibid., 9.7.1996, *Danin 963401* (HUJ).

A *Rubia tenuifolia* d'Urv. differt habitu semper fruticoso (non volubili), caulibus glabris (non scabris) et foliorum marginibus crassis eburneis laevibusque (non acutis scabris).

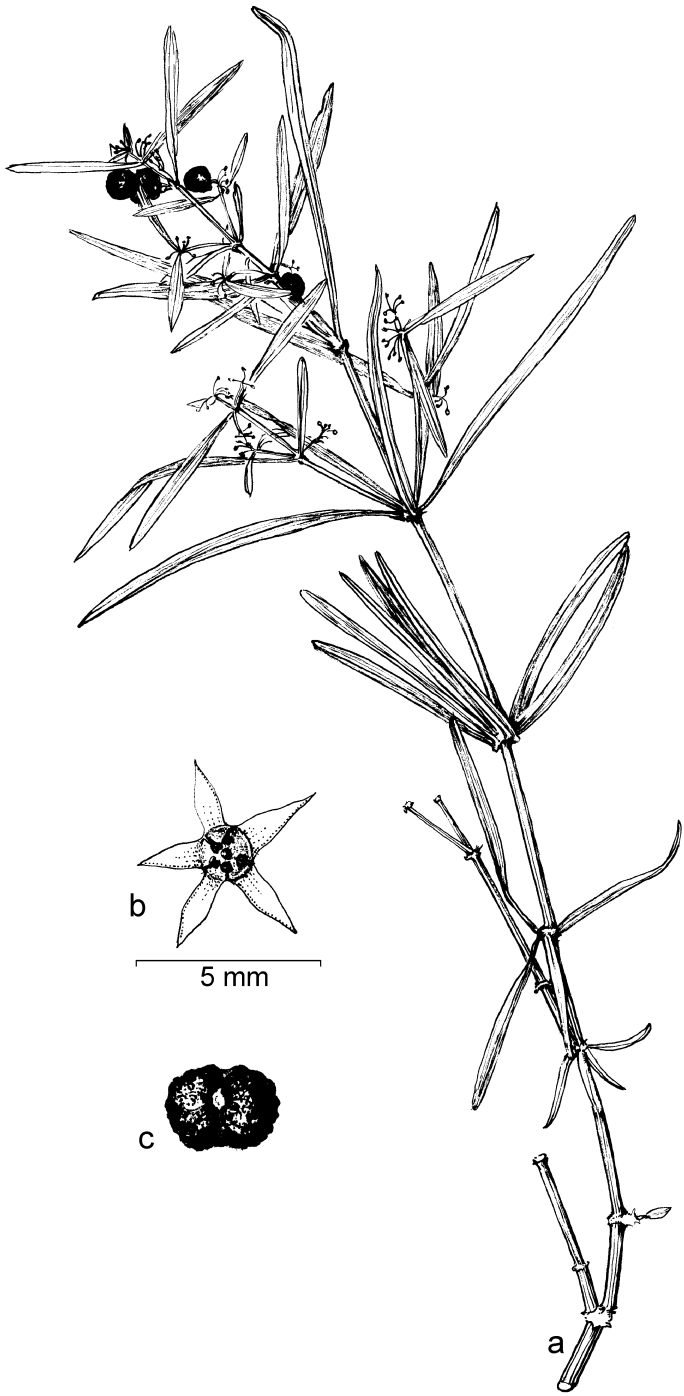

Fig. 2. *Rubia danaensis* – a: fruiting branch (× 1); b: flower; c: fruit (× 4.6).

Tab. 2. Differences between *Rubia danaensis* and *R. tenuifolia*.

Features	*R. danaensis*	*R. tenuifolia*
Habit	subshrub	vine or subshrub
Habitat	limestone cliffs	woodlands, sandstone and limestone cliffs
Stems, peduncles and pedicels	glabrous	hairy to scabrous
Edges of stems	prominent, ivory-white completely smooth	translucent, barely seen, always hairy to scabrid
Leaves	always linear, homogeneous, 1–3 mm wide	broadly obovate or ovate to oblong, narrowly lanceolate to sublinear, 2–11 mm wide
Leaf margins	completely smooth, peripheral veins swollen and ivory-white	with pairs of sharp hooked teeth directed towards leaf base and towards its tip
Median vein on the abaxial leaf face	completely smooth, swollen and ivory-white	with sharp hooked teeth directed towards leaf base
Second order bracts (on the first node of thyrse)	linear, 20–45 mm	ovate and apiculate, 10–15 mm
Pedicel	1 mm	2–8 mm
Corolla diameter	4–5 mm	3–7 (–8) mm
Tip of corolla lobes	1 mm	up to 0.6 mm
Flowering season	May-June	March-April
Fruit diameter	4–6 mm	5–8 mm

Fruticosus, 0.5–1.5 m. Caules suberecti vel ascendentes, lignescentes, glabri, hexagoni, angulis eburneis laevibus. Folia (5–)6-verticillata, coriacea, patentia, (15–)30–40(–50) × 1–3 mm, nervis centralibus subtus manifestis superne obscuris, eburneis laevibusque et in angulos caulinos decurrentibus atque marginibus crassis, sicut nervi laterales eburneis laevibus. Cymae axillares, foliis brevioribus; pedicellis 1 mm. Corolla flavo-viridula 0.2–0.3 mm diam., lobis anguste triangularibus, mucronato-aristatis, arista 1mm; antheris semi-globosis; stigmatibus capitatis brunneis. Fructus baccatus, atracinus, 4–6 mm diam.

Subshrub 0.5–1.5 m, entirely glabrous. Stems suberect to ascending, woody at base, with 6 prominent broadened cartilaginous edges (crests), smooth and ivory-white, narrow in young parts, separated by longitudinal depressions, becoming entirely ivory-white towards base; older lignified and leafless stems white to gray with fissured pilling bark. Leaves in whorls of (5–)6, coriaceous, spreading (15–)30–40(–50) × 1–2 mm, with ivory-white veinlike smooth margins, linear, acute, sessile, 1 mm wide at base; median vein hardly recognizable on the adaxial face, prominent, ivory-white and smooth on the abaxial face; each median vein continuously deccurent into one of the 6 longitudinal crests of the stem. Flowers developing from the lower third to the top of the leafy stems, arranged in sympodial inflorescences at the axile of two of the 6 whorled leaves; each such inflorescence is carried on a stem with 4 white longitudinal edges and may have 1–2 nodes with a pair of leaflike 20–45 mm long bracts in each node, and 2nd order branches carrying either single flowers or 3rd order branches terminating with 0.5 mm long bracteoles and a few flowers; inflorescence shorter than the subtending leaf (of the main stem). Pedicels 1 mm. Corolla greenish-yellow, 4–5 mm in diameter, lobes narrow-triangular, abruptly aristate, awns 1 mm. Anthers semi-globose, 0.2–0.3 mm in diameter. Styles 2(–3) with dark capitate stigmas. Fruit baccate, 4–6 mm in diameter, becoming shiny black. Flowering May-June.

Hab.: Crevices in limestone cliffs, 1300–1500 m.

Additional specimens seen
JORDAN: Edom, Shoubak, roadside near the ancient castle, 31.10.1995, *M. Ron*; 5 km S of Petra to Taiyiba, limestone cliff with *Juniperus phoenicea* trees, 8.7.1996, *Danin 963201*; 20 km W of Ma'an, Basta, limestone cliff, 19.6.1997, *Danin 971502*.

The variability of *Rubia tenuifolia* is well documented and discussed by Ehrendorfer & Schönbeck-Temesy (1982). In some of its characters *R. danaensis* resembles the narrow-leafed *R. tenuifolia* subsp. *doniettii* (Griseb.) Ehrend. & Schönb.-Tem. from S and SE Anatolia. However, according to Ehrendorfer (pers. comm.) all forms of *R. tenuifolia* have at least some hooked teeth at the leaf margins. My own observations in several populations in Jordan and Israel, and in all dozens of populations of *R. tenuifolia* represented by specimens at the herbarium of the Hebrew University (HUJ) are, that there is not even one population with smooth leaf margins. Absence or presence of leaf teeth may appear a rather trivial feature, the toothed leaf margin is, however, actually a very important adaptive property of *R. tenuifolia,* as it is a vine with twining stems, and the leaf teeth are directed in two directions assisting the climbing activity. Although being able to survive as a non-climbing shrub, the plant is doing best as a vine in maquis or as a pioneer vine penetrating fruit tree plantations in the Mediterranean territory of Israel. It is dispersed from nearby maquis by birds via endozoochory to high sites where birds prefer to perch for observing the area. *R. danaensis* seems to lack the property of climbing, having no teeth at the leaf margins and is, so far seen, confined to limestone cliffs and to disturbed ground at a roadside in Edom, Jordan. The success of chasmophytes at disturbed ground of roadsides is further discussed by Danin (1991) with regard to *Hyparrhenia hirta* (L.) Stapf, one of the most common plants of roadsides as well as rock crevices in Israel.

Silene danaensis Danin, **sp. nova** (*S.* sect. *Sclerocalycinae* (Boiss.) Schischk.) – Fig. 3.
Holotypus: Jordan, Edom, Dana Reserve, limestone cliff 500 m above and east of the visitor center, 9.7.1996, *Danin 963502* (HUJ; isotypi: B, E, K).

A *Silene schimperiana* Boiss. differt calyce et petalis 0.3 plo curtis, foliis basalibus spathulatis (non linearibus); a *S. swertiifolia* Boiss. differt petalis duplo brevioribus, anthophori capsula aequilongis (non 1.5–2 plo brevioribus) et seminibus duplo minoribus; a *S. libanotica* Boiss. differt seminibus duplo minoribus, corolla rosea (nec alba), petalis duplo minoribus angustioribusque, anthophoro duplo longiori.

Glaucescens, basi suffrutescens, caulibus erectis, rigidis, superne viscidulis, 40–80 cm. Folia inferioria oblongo-spathulata, mucronata; superiora anguste linearia. Pedunculi 1–5 cm longi, uniflori. Calyces subenervi, floriferi cylindrico-obconici, fructiferi clavati, dentibus anguste scariosis. Petala 14 mm longa, lamina anguste bifida, albida, rosea vel rubro-rosea; squamae corollae minutae. Capsula oblonga anthophoro aequilongo.

Perennial, glaucescent, glabrous, viscid above, 40–80 cm. Stems erect, with slightly thickened nodes. Leaves thick, glaucescent, glabrous, the lower ones oblong to spathulate, tapering to a petiole, the upper ones linear, clasping. Peduncle 1–5 cm long, 1-flowered. Bracts narrowly linear, glabrous, shortly hairy at margins. Pedicel 0.3 to 0.5 of calyx length. Calyx 18–20 mm long, cylindrical, club-shaped in fruit, obsoletely veined; teeth narrowly scarious. Petals 14 mm long, white, pink to meat-red, bifid into narrow lobes 2 × 1 mm; corolla scales minute. Capsule oblong, 7–8 mm, as long as anthophore. Seeds 1.5 mm in diameter, brownish yellow. Flowering June-August.

Hab.: In crevices of smooth-faced sandstone and limestone outcrops, and near limestone cliffs.

Specimens seen
Silene danaensis (Fig. 4): JORDAN: Edom, Dana Reserve, limestone cliff above the visitor center 9.7.1996, *Danin 963406*; ibid., Wadi Barra, sandstone crevices, 9.7.1996, *Danin 963602*; Jebel

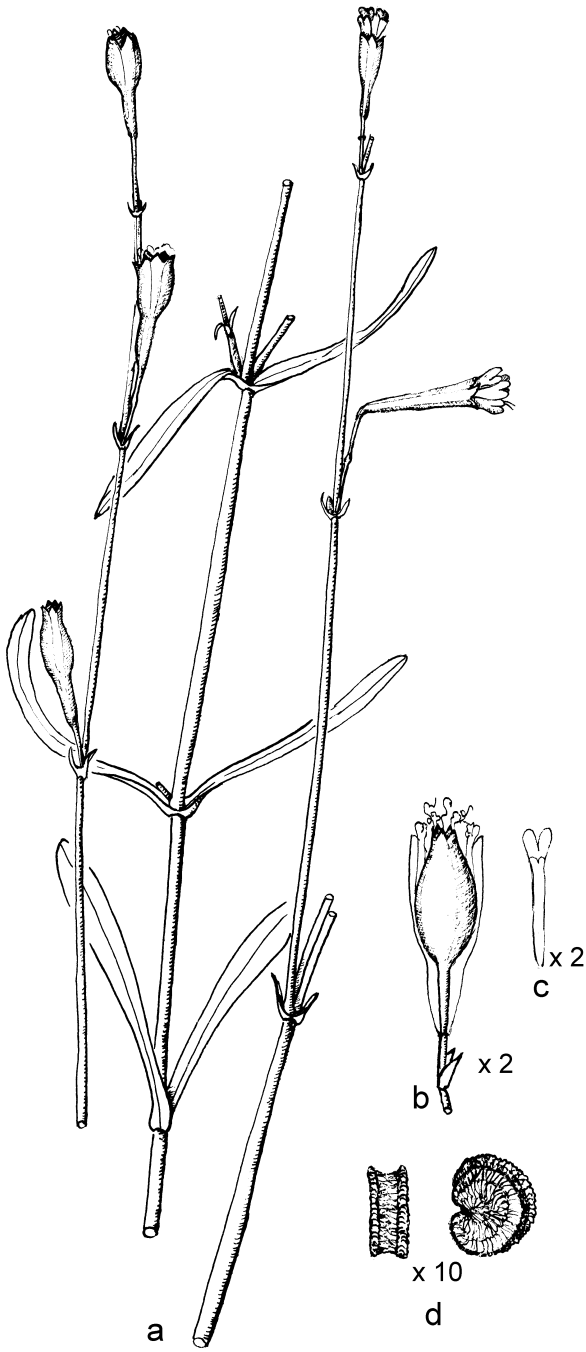

Fig. 3. *Silene danaensis* – a: flowering and fruiting branches; b: fruit in calyx; c: petal; d: seeds.

Tab. 3. Differences between *Silene danaensis* and related species.

Features	*S. danaensis*	*S. swertiifolia*	*S. libanotica*	*S. schimperiana*	*S. bubleuroides* subsp. *staticifolia*
Lower leaves	spathulate	spathulate	spathulate	linear to linear-lanceolate	linear to linear-lanceolate
Calyx	18–20 mm	19–20 mm	12–14 mm	25–30 mm	25–42 mm
Calyx teeth	narrowly scarious	narrowly scarious	broadly scarious	narrowly scarious	scarious
Petal length	14 mm	27 mm	13 mm	20-22 mm	?
Petal limb	4 mm	12 mm	8 mm	7–10 mm	8–10 mm
Petal lobes	2 × 1 mm	5 × 2.5 mm	3 × 2 mm	4 × 2.5 mm	?
Width of petal just below lobes	1.5–2 mm	5–6 mm	2.5–3 mm	4 mm	?
Colour of upper petal face	white, pink to meat-red	white	white-yellowish	white	creamy white to pale pink
Anthophore	7–9 mm	9–10 mm	4 mm	15 mm	10–27 mm
Capsule length	7–8 mm	13–15 mm	8–9 mm	12 mm	10–17 mm
Capsule diameter	3–4 mm	6–8 mm	4–5 mm	7–8 mm	?
Seed length	1.5 mm	3 mm	3 mm	1.8 mm	1.5–2 mm

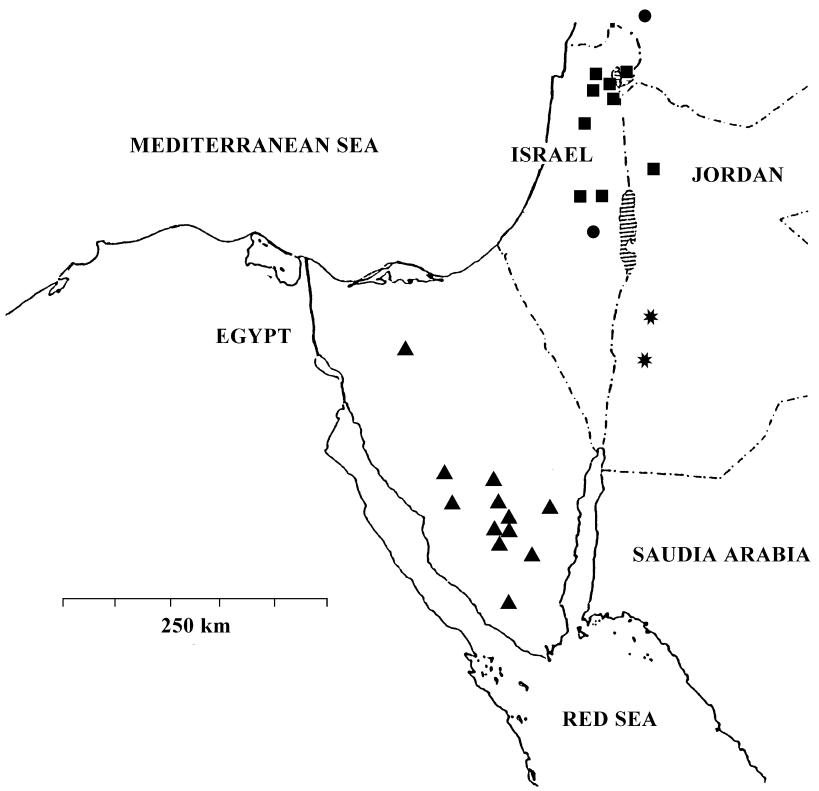

Fig. 4. Distribution of species of *Silene* sect. *Sclerocalycina* – *S. danaensis* (✷), *S. libanotica* (●), *S. swertiifolia* (■), *S. schimperiana* (▲).

Baida, 5 km N of Petra, sandstone crevices, 20.6.1997, *Danin 97901*.
S. libanotica (Fig. 4): ISRAEL: Judean Mts, in rupestribus Hebron Palestinae, *Kotschy 488* (G); LEBANON: Mt Hermon, 2000 m, 22.8.1985, *Liston & Lev-Ari.*
S. swertiifolia (Fig. 4): ISRAEL: Judean Mts, Jerusalem, 12.6.1958, *D. Zohary*; Lower Galilee, near Be'era, 7.4.1970, *R. Berliner*.
S. schimperiana (Fig. 4): EGYPT: S Sinai, Gebel Serbal, 30.6.1968, *Danin*; Central Sinai, Gebel 'Igma, Ras Gineina, 9.10.1969, *Danin & Halevy*.

Teucrium leucocladum Boiss. in Israel, Sinai, and Jordan

Teucrium leucocladum was described by Boissier (1844) from a specimen collected by Schimper at Wadi Hebran, Sinai. It is a subspinescent chamaephyte bearing pea-sized globular inflorescences at its intricately branched periphery, with the naked peduncle tip after seed dispersal becoming spinescent to varying extents. The leaves are subsessile, cuneate-obovate, at most 1 cm long, and have slightly revolute margins. These characters, as well as the flower size, are rather constant throughout the range of the species in Israel, Sinai, and Jordan. Unlike the other *Teucrium* species growing in the Sinai, i.e. *T. capitatum*, *T. pilosum,* and *T. polium*, which have branched hairs (Fig. 5e), *T. leucocladum* has an indumentum of simple and/or glandular hairs (Fig. 5a-d).

With respect to the stem indumentum, which is a feature of great taxomomic weight in *Teucrium* (Puech 1978, Navaro & Rosa 1988), remarkable differences are, however, found within *T. leucocladum*, and these differences are correlated to the flowering stem colour and geographical distribution: (1) populations from SW Sinai (including the type locality), S Israel and SW Jordan have white stems with a tomentum of simple, eglandular hairs, and shortly stipitate glandular hairs are present or not, (2) populations from high elevations of the S Sinai massif have green stems with a sparse indumentum of eglandular hairs and a dense cover of shortly stipitate glandular hairs, and (3) populations from Central W to SW Jordan have brown stems with sessile and stipitate glandular but without eglandular hairs.

According to these combinations of features three subspecies and two varieties of *T. leucocladum* are distinguished. Their distribution is shown in Fig. 6.

The stem indumentum, together with the shape of leaves and inflorescence, are diagnostic characters differentiating *T. leucocladum* from *T. capitatum* and *T. pilosum,* which may sympatrically grow with the former.

Teucrium leucocladum Boiss. subsp. ***leucocladum*** var. ***leucocladum*** – Fig. 5a.

Stems appressed-woolly, without glandular hairs below the curled white eglandular hairs. Corolla white.

Selected specimens seen
EGYPT: S SINAI: Wadi Hebran 20 km NE of El Tor [vicinity of the type locality], 21.3.1968, *Danin*; Wadi Hebran 50 km NE of El Tor, 800 m, 7.1.1969, *Orshan*; 18 km NE of Abu Zenima, 30.6.1968, *Orshan*; Gebel Humr'a 30 km E of Feiran, 13.8.1968, *Danin & Shmida*; env. of Gebel Sarabit el Khadem, 22.11.1956, *Zohary & Orshan;* Gebel Khizeimiya, 5 km N of St Catherine Monastery, 1400–1800 m, 23.3.1968, *Tadmor;* env. of Gebel Beida 20 km SE of monastry, Wadi Igda, 1300 m, 10.8.1968, *Danin.*
ISRAEL: S Negev, Nahal Shelomo (Wadi Masri), 1.4.1936*, Eig, Zohary & Feinbrun;* Timna (Wadi Menaiye), 20.4.1946, *Einstein;* Nahal Roded, 1.7.1963, *Danin.*
JORDAN: Aqaba to Ras el Naqb, 4.7.1943, *Capt. Glober.*

Teucrium leucocladum subsp. ***leucocladum*** var. ***glandulosum*** Danin, **var. nova** – Fig. 5b.
Holotypus: Egypt, Sinai, near St Catherine monastery, 7.3.1971, *R. Zur* (HUJ; isotypus: B).

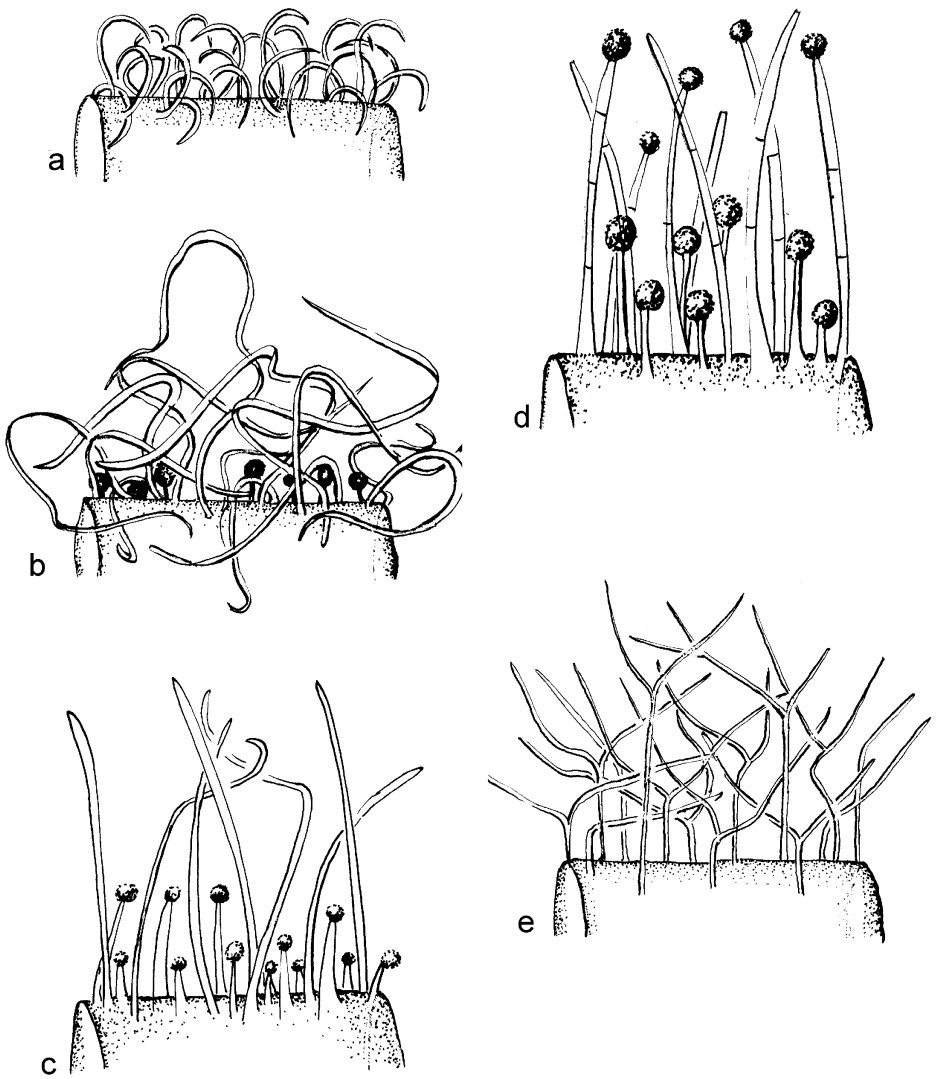

Fig. 5. Stem indumentum of *Teucrium leucocladum* (a-d) and *T. capitatum* (e) – a: *subsp. leucocladum* var. *leucocladum,* b: subsp. *leucocladum* var. *glandulosum*, c: subsp. *sinaicum*, d: subsp. *jordanicum.* – All ×40.

Caules floriferi adpresse cani, stipitis glandulosis provisi. Corolla alba.

Stems appressed woolly with short stipitate glandular hairs below the curled white eglandular hairs. Corolla white.

Selected specimens seen

EGYPT: S SINAI: Gebel Beida 20 km W of Ras Nusrani, 11.12.1968*, Danin & Tadmor;* Gebel Umm 'Alak, 1200–1300 m, 8.3.1969, *Tadmor;* near Wadi Kid, 50 km N of Sharm el-Sheikh, 700–900m, 18.2.1969, *Tadmor;* 70 km S of Thamad, Wadi Watir, 16.3.1970, *Shmida & Ager.*

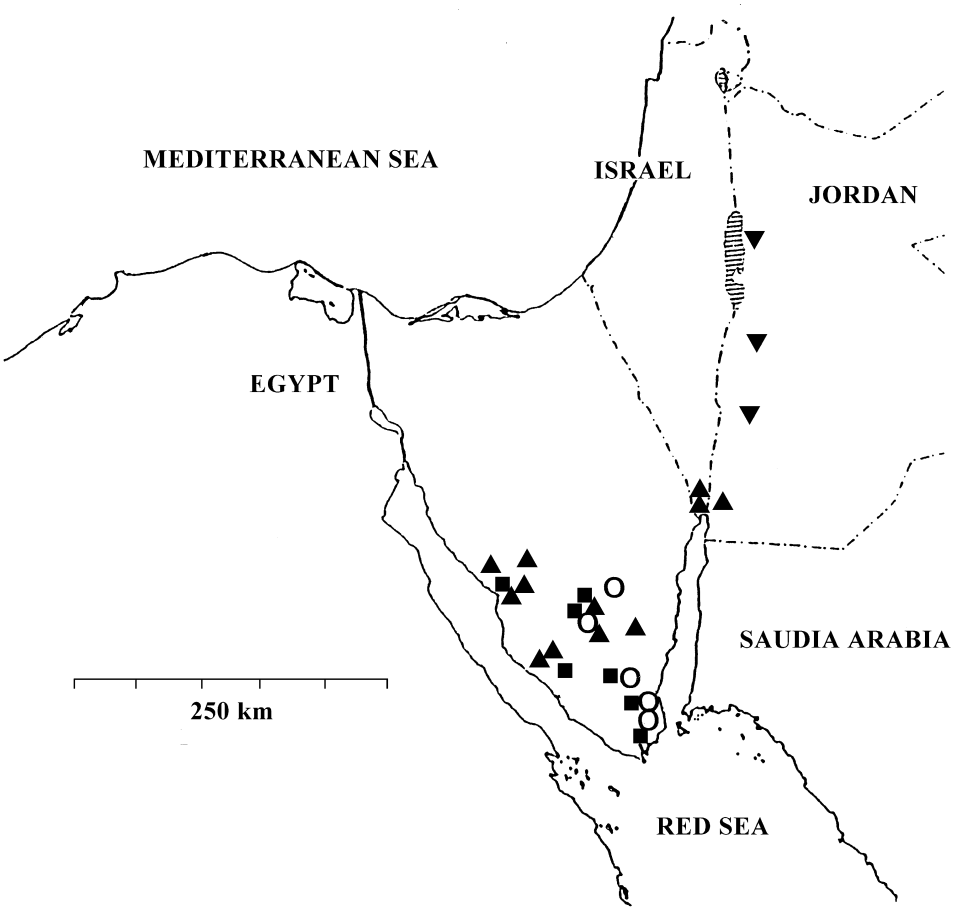

Fig. 6. Distribution of the subspecies and varieties of *Teucrium leucocladum* – subsp. *leucocladum* var. *leucocladum,* (▲) subsp. *leucocladum* var. *glandulosum* (○), subsp. *sinaicum* (■), subsp. *jordanicum.* (▼).

Teucrium leucocladum subsp. ***sinaicum*** Danin, **subsp. nova** – Fig. 5c.
Holotypus: Egypt, S Sinai, near St Catherine Monastery, red granite, steep smooth rocks, north-facing slope, 24.4.1968, *Danin* (HUJ; isotypus: B)

Caules floriferi viriduli cum pilis simplicis patulis strictis vel arcuatis et cum multis pilis glandulosis stipitatis vel sessilibus. Corolla alba.

Stems greenish, sparsely covered with long, straight or arch-shaped eglandular hairs and densely covered with short stipitate and sessile glandular hairs. The vesicular part of the glandular hairs contains transparent colourless substances. Corolla white.

Selected specimens seen
EGYPT: S SINAI: Gebel Katherina, 20.11.1956, *D. Zohary & Orsahn;* Wadi Sa'al el Rayan, 25 km NE of the monastery, 1300 m, 25.7.1968, *Tadmor;* Wadi Gargir 40 km ESE of El Tor, 1000 m, 3.9.1969, *Orshan & Rabinowitch;* 50 km N of el Tor, 26.6.1968, *Orshan;* 7 km NW of Sharm el Sheikh, Wadi Nuqwibat, 26.3.1971, *Danin;* Wadi Umm Matar, 40 km NNW of Sharm el Sheikh, 26.1.1969, *Orshan.*

Teucrium leucocladum subsp. ***jordanicum*** Danin **subsp. nova** – Fig. 5d.
Holotypus: Jordan, Edom, Dana Reserve, Wadi Barra, sandstone crevices, 9.7.1996, *Danin 63601* (HUJ, isotypi: B, E, K).

Caules floriferi fusci cum pilis glandulosis, patulis, strictis vel longis vel mediis vel curtis nec non glandulis sessilibus. Corolla alba vel eburnea.

Stems brown, densely covered with sessile as well as long, medium and short patent glandular hairs. Corolla white to ivory coloured.

Selected specimens seen (all growing in crevices of sandstone)
JORDAN: EDOM: 8.5 km N of Petra, 21.9.1995, *Künne 95–04–09;* Petra, 1.6.1995, *Leshner;* 3 km SW of Taiyiba, 28.9.1994, *Künne 94–12–24*; Dana Reserve, near the campsite below Jebel Rumana, 9.7.1996, *Danin 964005*; Jebel Baida, 20.6.1997, *Danin 971707*. – MOAV: Wadi Mujib area near the Dead Sea, -250 m, 5.4.1996, *Danin 961604.*

Taxa new to the "Flora Palaestina" area

Clypeola jonthlaspi subsp. ***microcarpa*** var. ***glabra*** (Boiss.) Reyn.
Jordan, Edom, Dana Reserve, Wadi Dana, sandstone outcrops, 7. 4.1996, *Danin 962410*.

This taxon has previously been known from Spain, Turkey, Iran, Tunisia, and Algeria (Breistroffer 1936, 1946), and is recorded here for the first time from the "Flora Palaestina" area. Zohary (1966) reports from this area three other varieties of this well studied, polymorphic species.

Hypericum sinaicum Hochst. ex Boiss.
Jordan, Edom, Dana Reserve, limestone cliff 500 m above and east of the visitor center, 13.5.1996, *Danin 962609;* ibid., 9.7.1996, *Danin 963501*.

According to the monographer of the genus, Dr N.K.B. Robson (pers. comm.), who determined the plants, this is the northernmost known locality of *H. sinaicum*. Outside Sinai it has been known so far only from Jabal Lawz in the extreme NW of Saudi Arabia (Robson 1996). The species is related to *H. collenettiae* N. Robson from the Asir in Saudi Arabia and *H. somaliense* N. Robson from N Somalia.

Plantago sinaica Decaisne
Jordan, Edom, Dana Reserve, Wadi Barra area, below the forest-ranger station, 2 km SE of the visitor center, in crevices and near smooth-faced white sandstone outcrops, 14.5.1996, *Danin 963020.*

P. sinaica is a perennial species, woody at base. It is rather common in S Sinai in crevices of smooth-faced granite. In the Dana Reserve it was found, so far, only near the type locality of *Micromeria danaensis* described above.

Veronica panormitana subsp. ***baradostensis*** (M.A. Fischer) M.A. Fischer
Jordan, Gilead, Zubia Reserve, N of Ajloun, maquis of *Quercus calliprinos,* 1000 m, 16.3.1996, *Danin 960845.*

Feinbrun & Danin (1991: p. 614) included the diploid *V. panormitana* in the polyploid *V. cymbalaria* Bodard. In contrast, Fischer (pers. comm.) strongly recommends recognition of *V. panormitana* as a separate species. He notes that it is easily distinguishable from *V. cymbalaria* and quotes also a few specimens of subsp. *baradostensis* from Israel (e.g., Tel Aviv, 2.3.1982, *U. Bernert;* Jericho, 4.1863, *B. T. Lowna* [in BM]; Wadi Yarmuk below El Hami, 4.4.1942, *P. H. Davis 4327* [in K]). He also saw a specimen of *V. panormitana* subsp. *panormitana* (Jerusalem, 21.3.1899, *Eggers* [in JE]).

Veronica polifolia Benth.
Jordan, Edom, northern section of Dana Reserve, the *Cupressus sempervirens* reserve (4 km S of Bseara), 1500 m, sandy soil, 15.5.1996, *Danin 963101*.

This is not the first collection of this species from Jordan. Prof. M.A. Fischer (pers. comm.) wrote me that he examined a specimen of this species in E (Edinburgh): "*Poterium spinosum,* slope above Tafileh, 29.4.1955, *Hunting Aero Survey 140*". This specimen has, however, not been recorded in the literature. The closest collection sites hitherto reported is Mt Hermon (Feinbrun-Dothan & Danin 1991), where it grows in dolines and adjacent slopes. In Jordan it was found in a dwarf shrub formation on sandy soil at a northern slope, dominated by *Artemisia sieberi* Besser with *Linum toxicum* Boiss. and *Scutellaria tomentosa* Bertol. among the rare companions.

In order to ease identification of this species the reader is referred to the colour photograph in Feinbrun-Dothan & Danin (1991: top of p. 969, 2nd from left) where it is erroneously named as *Veronica orientalis* Miller. The latter grows sympatrically with *V. polifolia* at Mt Hermon.

Taxa new to Jordan

Alcea galilaea Zohary
Jordan, Gilead, Pella, 50–200 m below sea level, 15.3.1996, *Danin 960106.*

Linum toxicum Boiss.
Jordan, Edom, northern section of Dana Reserve, the *Cupressus sempervirens* reserve, sandy soil, 15.5.1996, *Danin 963108*.

Reaumuria negevensis Zohary & Danin
Jordan, Edom, 5 km W of Tafila to Fifi, chalky slopes, 9.7.1996, *Danin 964201*.

This fairly common species of the Israeli Negev and N Sinai (Danin & al. 1985, Feinbrun-Dothan & Danin 1991) is reported from Jordan for the first time where it is confined to its typical habitat.

Saxifraga hederacea L.
Jordan, Gilead, Zubia Reserve, north of Ajloun, in crevices of limestone cliff facing north, 1000 m, 16.3.1996, *Danin 960810*.

Stachys zoharyana Eig.
Jordan, Gilead, above Pella, near Kafar Rakeb, wheat fields, 200–500 m, 15.3.1996, *Danin 960301*.

Teucrium montbretii Benth.
Jordan, Edom, Dana Reserve, Wadi Barra area, below the forest-ranger station, 2 km SE of the visitor center, in crevices of smooth-faced white sandstone outcrop, 14.5.1996, *Danin 963016*.

In the "Flora Palaestina" area this species is rare and confined to limestone cliffs in the Judean and Samarian Deserts (Davis 1951, Feinbrun-Dothan 1978). In SW Jordan it was discovered on one rock outcrop and was not found yet in additional locations.

Davis (1951) described three new subspecies of this species, but our specimen does not agree with *T. montbretii* subsp. *montbretii,* and there is not even one diagnostic character by which it could be included in one of the other three subspecies. Raceme length is one of the characters by which Davis (1951) differentiates the subspecies. Material of *T. montbretii* subsp. *judaicum* Davis collected at the type locality in 1942 (HUJ!) have longer racemes than the type and also than what Davis (1951) considers characteristic for this taxon. Petiole length and number of crenae in the leaf vary in all the taxa and cannot be considered diagnostically. The indumentum, also being a diagnostic feature according to Davis (1951), is similar in all three non-typical subspecies, consisting of long eglandular hairs and short stipitate glands. Morpholo-

gically, the specimen from Jordan comes closest to *T. montbretii* subsp. *pamphylica* Davis from Turkey (isotype in HUJ!), and not as expected to *T. montbretii* subsp. *judaicum.* Apparently, further investigations regarding the infraspecific taxonomy of *T. montbretii* are necessary.

Typha elephantina Roxb.
Jordan, Edom, 10 km E of Fifi to Tafila, by the water of a spring in sandstone, 9.7.1996, *Danin 964101.* – Egypt, Sinai, Beer Achmed, 15.1.1957, *D'Angelis*; ibid., Ein Umm Ahmed [possibly a name variant for the aforementioned location], 30 km W of Nuweiba, 28.6.1972, *Goren*.

In the Jordanian locality, there is a constant waterflow from springs along the wadi, which runs parallel to the new road from Tafila to Fifi at the rift valley. The species is accompanied by *Phoenix dactylifera, Populus euphratica, Typha domingensis, Saccharum ravennae,* and *Phragmites australis*, all indicating the availability of fresh water close to soil surface the year round.

In the Near East *T. elephantina* is a rather rare species, recorded from Libya (Boulos 1977), Egypt (Boulos 1962, Danin & al. 1985), Israel (Feinbrun-Dothan 1986) and Saudi Arabia (e.g., Zahran 1983, Collenette 1985). It might, however, be more common than reported. The most instant morphological diagnostic character is its keeled wide leaf; the leaves of the other *Typha* species in the area are not keeled.

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