Contributions to the flora of Jordan 3. A new species of Artemisia (Compositae, Anthemideae) from S Jordan

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Contributions to the flora of Jordan 3. A new species of *Artemisia (Compositae, Anthemideae)* from S Jordan

Abstract

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Artemisia (sect. *Dracunculus*) *jordanica* from S Jordan, Saudi Arabia and SW Iraq is described as a species new to science, illustrated and compared to its closest relative, *A. monosperma*. A lectotype is designated for the name *A. monosperma*.

Among the collections from a few excursions to S Jordan, a new species of *Artemisia* has been discovered. It is a shrubby plant, which resembles *A. monosperma* Delile in the general morphology of its lignified parts and inflorescences. It occurs in S Jordan in scattered populations, being confined to sandy wadis in gravel plains of extreme desert areas. Previously misidentified as *A. monosperma,* it is also widespread in Saudi Arabia and present in SW Iraq.

Artemisia (sect. *Dracunculus*) ***jordanica*** Danin, **sp. nova** – Fig. 1, 2A
Holotype: Jordan, Ma'an district, 45 km N of Mudawwara, sandy wadi, 26.10.1997, *Danin 972901* (HUJ; isotypes B, BM, E, K).

Affinis *A. monospermae* Delile sed foliis caulinis linearibus indivisis (non pinnatisectis), adpressis sericeis glaucis (non glabris vel glabrescentibus, viridibus), subtus uni-, 3-, vel 5-nervis valde differt.

Ascending semishrub, 50-100 cm high, aromatic, scent resembling that of *A. monosperma;* base of stems with appressed silky indumentum. *First order cauline leaves* (15-)30-45(-80) × 1-3.5(-8) mm, solitary, linear, mucronate, undivided or very rarely with terminal linear lobes, sessile, mostly with 1-5 prominent veins on the abaxial side, densely covered with appressed, silky hairs, appearing glaucous. *Second order cauline leaves* 4-20 × 1-2 mm, clustered at the axiles of the first order leaves, glabrous, frequently covered by yellowish transparent viscous fluid. *Stems* ascending-erect, becoming thick and lignified, terminating in a slender conical-shaped, many-capitulate synflorescence; branches of the flowering shoots patent, almost unilateral, with numerous minute capitula solitary in the axiles of linear, acute, mucronate, glabrous bracts of 2-3 × 0.5-1 mm.

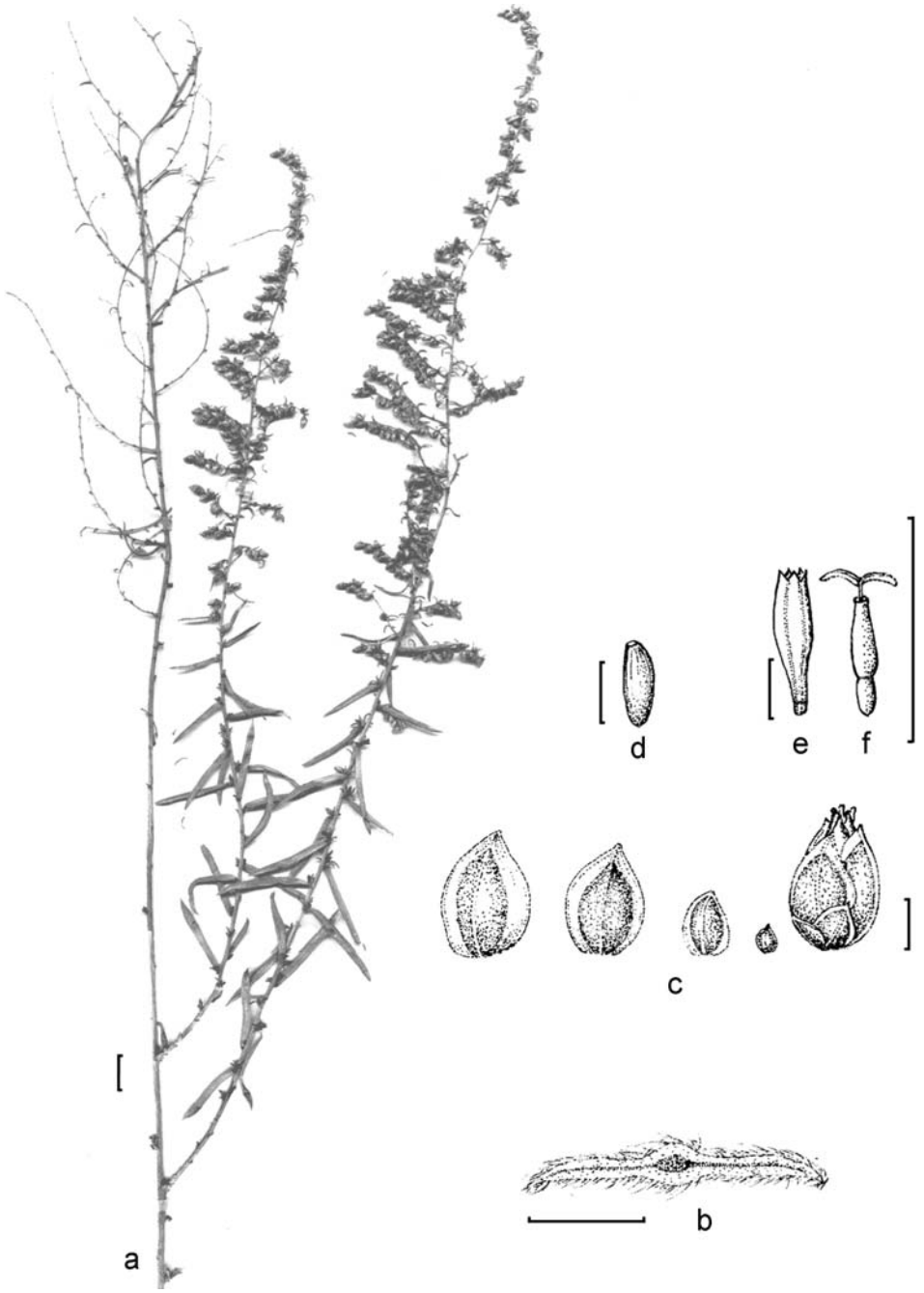

Fig. 1. *Artemisia jordanica* – a: previous year's flowering shoot with two flowering branches; note the undivided first order leaves and the minute axillary second order leaves; b: leaf cross section showing the appressed-silky indumentum; c: inner and outer phyllaries and capitulum; d: achene; e: staminate flower; f: pistillate flower. – Scale: a = 10 mm, b-f = 1 mm); after/from the type collection.

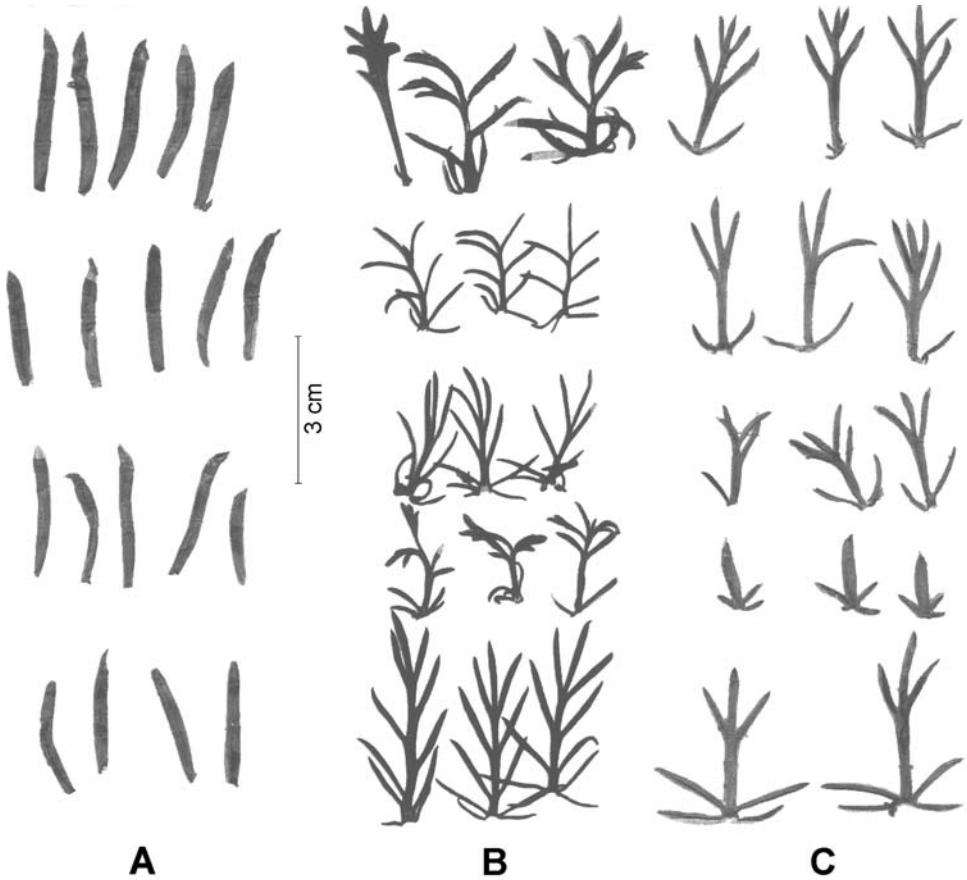

Fig. 2. First order leaves of species of *Artemisia* sect. *Dracunculus* – A: *A. jordanica,* leaves of four different plants collected in S Jordan, 50 km N of Mudawwara; B: *A. monosperma,* leaves of five different plants collected in Israel, Coast of Carmel, Dor, 28.3.1998; C: *A. monosperma,* leaves of five different plants collected in Israel, S Negev, Biqa'at Uvda.

Peduncles absent or up to 1-1.5 mm long. *Involucre* glabrous, outer phyllaries orbicular, herbaceous, inner ones oblong and scarious. *Capitula* ovoid, 2-4 mm long, 1.5-2 mm wide, heterogamous; staminate flowers 4-5, corolla 2.5 mm long, glandular, yellowish white, 5-dentate, with a trumpet-like derivative of a style rich in papillae at its broad top; pistillate flowers 2, corolla obliquely terminating, 0.4-0.8 mm long, glandular, without apical teeth. *Achenes* 1.5 × 0.5 mm, brown, commonly two per capitulum. Flowering in autumn.

Distribution

Artemisia jordanica is distributed in S Jordan, N, E and Central Saudi Arabia, and in SW Iraq. In Jordan the species is confined to extreme desert areas, where it grows in wadis with sandy ground. Once it was collected in a sand sheet of the sandstone terrain N of Wadi Rum *(Danin 980501)*. In Saudi Arabia, where the species is known as *A. monosperma,* it seems to be confined to deep sands and constitutes a dominant element in several plant communities of the Dahna sand belt and the Great Nafud (Miller & Cope 1996: 18, Mandaville 1998; Zohary 1973: 277, Chaudhary 1999: 15, Chaudhary & Al-Jowaid 1999). A colour photograph of *A. jordanica* is presented by Collenette (1985: 139, substantiated by *Collenette 2508,* see below). She writes: "A very

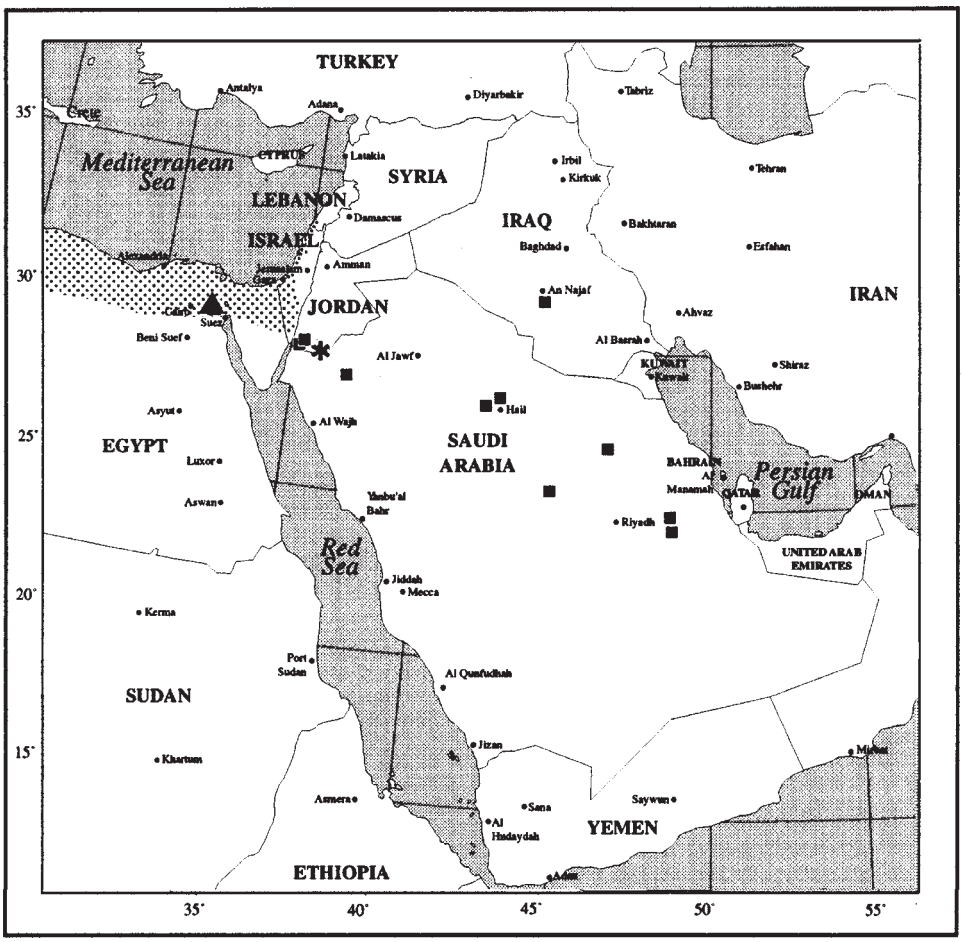

Fig. 3. Distribution of *Artemisia jordanica* (✻ = type locality, ■ = additional specimens seen) and *A. monosperma* (dotted area, ▲ = type locality).

bushy leafy shrublet to 1 m high with narrow simple leaves, ... aromatic; autumn flowering. Very widespread locally – among sand dunes".

Additional specimens seen

JORDAN: Ma'an district, Aqaba road to Rum, alt. 800 m, sandy desert, 20.12.1954, *Kasapligil 1828* (HUJ); Ras Naqb, 1300 m sandy places, 18.12.1954, *Kasapligil 1810* (HUJ); env. of Queira, 29.1.1944, *Eisenstein* (HUJ); 20 km NE von Quweirah, 1000 m, sandstein, 13.4.1980, *Kürschner 5756* (HUJ); El Hesma (22 km N of Queira), sandy soil, assoc. of *Zilla spinosa – Noaea mucronata,* 800 m, 30.11.1936, *Eig, Zohary & Feinbrun* (HUJ); Sahel Amar wa Amira, a wadi in a gravel plain with sandy soil, 19.6.1997, *Danin 971401* (HUJ); 57 km NE of Aqaba, near Jabal Umeid, a sandy wadi, 10.5.1998, *Danin 980501*(HUJ).

SAUDI ARABIA: Ain Aucoeivireh from the Nefud, 11.1883-2.1884, *Hart* (K); Al Makhlah (Tubuk area), 16.12.1942, *Kort* (HUJ); Mughaire (Tubuq area), fixed sand dunes, 23.12.1942, *Hardy* (HUJ); red sand dune W of Zabirah, 200 km N of Buraydah, a tongue of the Great Nafud, 600 m, *Collenette 2508* (K); 15 km W Khurays, in Dahna, sand, 4.1.1968, *Mandaville 1146* (BM);

27°15'N 47°15'E, in sand in wadi bed, 18.3.1967, *Mandaville 802* (BM) [leaves of this specimen have a few terminal lobes, but none have basal lobes]; Al-Ghawar, nr. J. al-Khalilayn, 24°32'N 49°15'E, sandy area between limestone hillocks, 29.11.1978, *Mandaville 7069* (BM); Arg Banton, 10.1.1931, *Philby* (BM) [vern. name Adhir]; Makharr, 5.12.1931, *Philby* (BM) [vern. name Adhir]; 58 km up Buraidah road from Jeddah-Riyadh road, 800 m, 10.3.1966, *Hemming 2402 (*BM) [vern. name Ad'r].

IRAQ: 4 km NE of Rahba, near the road from Najaf to Rahba, sandy desert, 5.12.1973, *Weinart & Mousawi* (GH).

Comparison of *Artemisia jordanica* Danin and *A. monosperma* Delile

Leaf morphology and indumentum provide the most reliable diagnostic features of *Artemisia jordanica* for distinguishing it from the closely related *A. monosperma*. Both species are the only representatives of *A.* sect. *Dracunculus* in the study area. They are ascending chamaephytes commonly 50-100 cm in height and diameter. The regular phenological cycle of an adult shrub starts in the winter of a rainy year. New skeleton shoots sprout from buds at the basal parts of the adult plant and carry the first order leaves; later, second order leaves develop at the axils of the first order leaves. Second order branches of the upper half to third of these stems carry the capitula on third order branchlets. Under relatively dry conditions the first order leaves wilt after less than six months, under better conditions they can last several months longer than half a year.

First order leaves of *A. jordanica* from S Jordan are shown in Fig. 2A, first order leaves of *A. monosperma* from the coastal plain and the S Negev, Israel, are shown in Fig. 2B-C. *A. jordanica* differs significantly and consistently from *A. monosperma* in having linear, entire instead of pinnatisect leaves (see also Delile's original illustration of *A. monosperma,* Delile 1813-14: pl. 43, fig. 1). Only in very rare cases the leaves of *A. jordanica* have two or three small linear terminal lobes but they never have basal lobes.

All first order leaves of *A. jordanica* are densely covered with appressed silky hairs (Fig. 1b), causing the leaves to look glaucous. *A. monosperma,* in contrast, is glabrous or glabrescent, and apart from very young seedlings or occasional hairy specimens in the coastal plain, it always looks green. In the latter hairy situation, the hairs in *A. monosperma* are not appressed. Most first order leaves of *A. jordanica* have a prominent vein, plus 2 or 4 parallel veins on the abaxial surface. No such venation is seen in *A. monosperma*. Young developing buds in the axils of the first order leaves of both species are covered by yellowish transparent viscous fluid. It was suggested for *A. monosperma* (Danin 1996) that the function of this "glue" is to protect the young and soft tissues from abrasion. Sand grains glued to the leaf surface become a protective layer from wind-borne sand. In dry years no new stems develop, the transpiring area decreases gradually and no flowering takes place.

There are no significant differences in flower and capitulum morphology between *A. jordanica* and *A. monosperma*. The staminate flowers of both species have a trumpet-like derivative of a style (Feinbrun 1978: fig. 593, lower capitulum); their pistillate flowers look the same and the size proportions of staminate and pistillate flowers are the same in both species too.

The description of *A. monosperma* in Mandaville (1990: 304-305, based on, e.g., *Mandaville 1146,* see specimens seen) appears somehow ambiguous though it fits *A. jordanica* rather than *A. monosperma*. Mandaville overlooked the relation between the position of the leaves and their indumentum, when he states that the plants are "green to silvery-green" and "glabrous to finely appressed-silky". The first order leaves of *A. jordanica* are actually always finely appressed-silky, silvery-green or glaucous, and linear lanceolate (Fig. 1 and Fig. 2A), but the higher order leaves are glabrous and green.

A. jordanica is recorded so far only from extreme desert areas with a mean annual rainfall below 50 mm, whereas *A. monosperma* grows in the range of 50-600 mm mean annual rainfall. *A. jordanica* plants in the populations observed so far in Jordan grow as single shrubs and well spaced, while *A. monosperma* often densely covers stable sand sheets in the W Negev, NE Sinai

and the coastal plain of Israel (Danin 1983, Danin & Solomesch 1999), acting as an important sand-stabilizer in both areas. There are no morphologically transitional forms between the two species, even where their distribution areas almost meet (Fig. 3): *A. monosperma* in the Biqat Uvda area in the S Negev has typical pinnatisect leaves (Fig. 2C), and *A. jordanica* in the Wadi Rum area, the northern boundary of this species, has entire linear leaves like those in Fig. 1 or Fig. 2A.

Lectotypification of *Artemisia monosperma* Delile

The author of *Artemisia monosperma* is Delile (1813-14: 263. 1814) and the main set of his collections is at Montpellier (MPU). However, many possibly authentic specimens of Delile, typically labelled "Egypte" and often with a typical arrow-shaped slit in the label, are held in the Edinburgh herbarium (E). Among them, there is a sheet of *A. monosperma* labelled (not in Delile's hand) "*Artemisia* nova sp. Desert du Suez, Egypte" and (on a typewritten label) "possibly an original gathering or type material of *Artemisia monosperma* Delile", comprising two flowering stems. The right stem has two branches and small second order leaves at their base and has no resemblance to Delile's illustration (Delile 1813-14: t. 43, fig. 1). The left branch, however, strongly resembles that illustration. Its upper part is completely fertile, bearing capitula throughout, and its foliage is composed of small bract. The tips of the flowering branches make a triangular silhouette with proportions similar to that of the same part of the branch in the illustration. Below the flowering branches there are three vegetative lateral branches, which seem to become "skeleton stems" and therefore carry first order leaves (the illustration shows four such branches in the same position and the same state of development). Several pinnatisect leaves match nicely those illustrated in the same position in Delile's plate. There are no specimens of such high resemblance to Delile's drawing of *A. monosperma* at the "Herbier Delile" and "Herbier general" in Montpellier (MPU; P. A. Schäfer and J. Mathez, pers. comm. 1999). Consequently I formally typify the name *Artemisia monosperma* with the specimen at Edinburgh.

Distribution of *Artemisia monosperma*

The distribution of *A. monosperma* in the "Flora orientalis" area as given by Heller & Heyn (1993) has to be revised. There was no genuine *A. monosperma* specimen in the material available to me from Jordan, Saudi Arabia and Iraq, and also from the descriptions in the floristic literature to these countries it has to be concluded that *A. monosperma* is absent there and apparently restricted in its distribution to Libya (fide Alavi 1983: 184, no material seen), Egypt, Israel and Lebanon (Fig. 3).

Additional specimens of *Artemisia monosperma* seen

EGYPT: In aggeribus arenae mobilis, Ismailia, 15.2.1877, *Letourneux* (E, K); Cairo, 1880, *Schweinfurth* (E); Alexandria, road near wadi Natrun, 26.12.1944, *Davis 8009* (E); between Bir Hooker & Alexandria road, sandy depression, 24.12.1944, *Davis 8095* (E, K); abundant in wadi Suez of the Suez road between towers 5+6, 20.3.1922, *Simpson 846* (K); near Romaneh, 24.4.1919, *Ogilvie* (K); along the desert road Cairo-Amria, 31.5.1964, *Täckholm* (K); 79 km from Cairo to Ismailia, desert road, 28.10.1980, *El Bakry 94* (K).
ISRAEL: Acre, sand dunes, 14.3.1942, *Davis H103* (E); coast of Carmel, Dor, 28.3.1998, *Danin* (HUJ, see Fig. 2B); Sharon Plain, Caesarea, 1 km E of the coast, 11.1997, *Danin* (HUJ); Philistean Plain, Ashkelon, sands, 15.10.1954, *Zohary & Grizi 697* (HUJ, E, K, BM); Negev, Revivim, 24.9.1949, *D'Angelis* (HUJ, E); Machtesh Ramon, Nahal Ardon, 15.11.1977, *Raviv* (HUJ); S Negev, Biqa'at Uvda, Nahal Yithro, 6.4.1999, *Danin* (HUJ, see Fig. 2C).
LEBANON: Tyre, 1863-4, *Lowne* (E, BM).

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baria of the Royal Botanic Garden Edinburgh (E), the Royal Botanic Gardens Kew (K), the British Museum London (BM), the Harvard University (GH) and The Hebrew University of Jerusalem (HUJ); for their help. I thank Dr Michal Yuval for drawing Fig. 1 and editing Fig. 2, and Mrs Tamar Soffer for drawing Fig. 3. The discovery of this new species would not have been made without the devotion of Mr S. Hanegbi, The Camel Riders, Shaharut, Israel, and his study of the ancient camel caravan routes in the desert areas of S Jordan.

References

Alavi, S. A. 1983: *Asteraceae*. – In: Jafri, S. M. A. & El-Gadi, A. (ed.), Flora of Libya **107.** – Tripoli.

Chaudhary, S. A. 1999: Flora of the Kingdom of Saudi Arabia **1.** – Riyadh.

— & Al-Jowaid, A. A. A. 1999: Vegetation of the Kingdom of Saudi Arabia. – Riyadh.

Collenette, S. 1985: An illustrated guide to the flowers of Saudi Arabia. – London.

Danin, A. 1983: Desert vegetation of Israel and Sinai. – Jerusalem.

— 1996: Plants of desert dunes. – Pp. 47-48 in: Cloudsley-Thompson, J. L.(ed.), Adaptations of desert organisms. – Berlin & Heidelberg.

— & Solomesch, A. I. 1999: *Retametea raetam*. – Pp. 217-311 in: Danin, A. & Orshan, G. (ed.). Vegetation of Israel. I. Desert and coastal vegetation. – Leiden.

Delile, A. R. 1813-14: Description de l'Égypte. – Paris.

Feinbrun-Dothan, N. 1978: Flora Palaestina 3. – Jerusalem.

Heller, D. & Heyn, C. C. 1993: Conspectus florae orientalis. – Jerusalem.

Mandaville, J. P. 1990: Flora of eastern Saudi Arabia. – London & New York.

— 1998: Vegetation of the sands. – Pp. 191-208 in: Ghazanfar, S. A. & Fisher, M. (ed.), Vegetation of the Arabian Peninsula. – Geobotany **25.**

Miller, A. G. & Cope, T. 1996: Flora of the Arabian Peninsula and Socotra **1.** – Edinburgh.

Zohary, M. 1973: Geobotanical foundations of the Middle East. – Stuttgart & Amsterdam.

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