

(12) *Launaea angustifolia*

Launaea angustifolia (Desf.) Kuntze, Revis. Gen. Pl. 1: 351. 1891 ≡ *Sonchus angustifolius* Desf., Fl. Atlant. 2: 225. 1799 ≡ *Zollikoferia angustifolia* (Desf.) Coss. & Durieu in Bull. Soc. Bot. France 2: 254. 1855 ≡ *Atalanthus angustifolius* (Desf.) Pomel in Bull. Soc. Climatol. Alger 11 [Nouv. Mat. Fl. Atl. 1]: 8. 1874 ≡ *Rhabdotheca angustifolia* (Desf.) Pomel in Bull. Soc. Climatol. Alger 13 [Nouv. Mat. Fl. Atl. 2]: 263. 1875. – Holotype: Tunisia, prope Cafsam [= Gafsa], *Desfontaines* (P).

lc.: Figs 13g-k, 20a, 97. – Gubb 1913: p. 123 sub *Z. angustifolia* (habit); Quézel & Santa 1963: fig. 3104 (achene); Ozenda 1958, 1977: fig. 176 ≡ Pottier-Alapetite 1981: p. 1111, fig. 1609 (flowering branch, achene); Feinbrun-Dothan 1977: fig. 729 ≡ Al-Rawi 1987: p. 268, fig. 6 (habit and achene); Plitmann & al. 1982: p. 42 (habit); Alavi 1983: p. 389, fig. 105(D-F) sub *L. foxii* (habit, details); Collenette

1985: p. 160 (synflorescence, detail); Migahid 1989: fig. 295 (habit); p. 196, fig. 201, left, sub *L. cassiana* (habit); Mandaville 1990: fig. 230 (habit), fig. 231 (capitulum).

Description

Annual (to pauciennial?) herb with slender taproot, flowering 5-25(75) cm high, with a single, \pm erect, leafy, \pm branched stem, often robust but considerably varying in thickness, or with a few to several ascending to erect stems. *Basal leaves* \pm crowded, (1.5)4-8(12) \times (0.2)1-3(5) cm, spatulate in outline, rarely subentire, otherwise sinuate-dentate to more frequently pinnatifid, pectinate-pinnatifid, or bipinnatifid, attenuate into a semiamplexicaule base, margin white-cartilagineously denticulate; *cauline leaves* in outline \pm lanceolate, broadly auriculate, irregularly \pm pectinate at base, otherwise similar, higher up the stem reduced to lanceolate, auriculate to cordate, ovate-acute bracts variable in size. *Synflorescence* of a single stem fairly variable in richness, sometimes with a single or a few capitula, sometimes with several, in general, however, rather poor. *Peduncles* as the terminal segment of the flowering axes 1.5-8 cm long, with a few to several bracts passing over into the outer involucre bracts; capitula nodding before anthesis, being erect during anthesis and nodding at fruiting time again. *Capitula* with c. 60->100 flowers. *Receptacle* at fruiting time 4-12 mm in diameter. *Involucre* at anthesis somehow campanulate, 9-16 mm long, after anthesis scarcely prolonged but receptacle becoming conspicuously larger, finally fruiting involucre globose; at time of fruit dispersal involucre bracts somewhat spreading and their midrib as well as the basal part of the capitulum swollen and hardened; outer involucre bracts c. 8-12, without scarious margin, apically contracted into a white-cartilagineous prickle, the outermost 2.5-7 \times 2-5 mm, ovate-acute, the following bracts gradually larger but similar in shape, the innermost spatulate to lanceolate, at anthesis in length \pm equalling up the inner involucre bracts; inner involucre bracts c. 10-12, with \pm obtuse, \pm white-scarious tip, otherwise at most with indistinct scarious margin, lanceolate to linear-lanceolate, at anthesis \pm equal in length, 9-14(16) \times 2-4 mm, towards fruiting time becoming little different in length to each other. *Flowers* with a ligule of (9)13-20 \times (2.2)3.0-5.2 mm, bright yellow (the marginal dorsally greyish), and a tube 1/3-<1/2 as long as ligule; anther tube without appendages 2.6-3.4 mm long, longer in inner than in marginal flowers, apical appendages 0.4 mm and basal appendages 0.4-0.6 mm long; style branches 2.0-2.6 mm long, sweeping hairs yellow. *Achenes* 2.3-3.3 \times 0.4-1.8 mm, heteromorphic, all, or all except for the innermost, densely papillose with long hyaline papillae; inner stout cylindrical, \pm 4-angular, apically truncate, basally 4-horned, with 4 main ribs each accompanied by 2 \pm distinct secondary ribs, towards the margin of the receptacle achenes slightly compressed and curved; papillae forming a longitudinal, spreading, hyaline fringe on the main ribs and, less obvious, on the secondary ribs, making the achenes \pm distinctly winged; the very marginal achenes with 5 (unequal) main ribs each accompanied by 2 secondary ribs, somewhat compressed and curved, otherwise like the inner. *Pappus* 4-6 mm long, persistent, homomorphic with numerous cottony rays of \pm equal length and diameter, or (sub)dimorphic, with 2-6 setaceous longer inner rays.



Fig. 97. *Launaea angustifolia* – plant from Jabal Sanam, Iraq (subsp. *arabica*; Rechinger 8571, W).

Recognition of subspecies

Two subspecies are recognized here due to differences in achene and pappus characters. Of these, subsp. *angustifolia*, confined to a small area in NW Africa,

taxonomically as well as geographically (see Fig. 98) forms some sort of a link between *L. angustifolia* and *L. quercifolia*. Subsp. *arabica* shows a Saharo-Arabian distribution pattern (see Fig. 98).

Alavi (1983: 378, 386, 390) has been aware of the existing differences. He treated both taxa as separate species, but erroneously identifying the Saharo-Arabian taxon with *L. angustifolia* and the exclusively NW African taxon with *L. foxii* (Post) Eig (= *L. arabica* (Boiss.) H. Lindb.), whilst the opposite is correct.

Key to the subspecies of *Launaea angustifolia*

- 1 Innermost mature achenes glabrous, others papillose; papillae on each longitudinal rib forming a wing but the papillae not or scarcely being connate (Figs 13j-k); the cottony pappus usually also with 2-6 setaceous longer rays subsp. ***angustifolia***
- All mature achenes papillose; papillae, particularly on the main ribs, connate to a smooth, hyaline wing \pm eroded on the edges (Figs 13g-i); the cottony pappus homomorphic, without setaceous longer rays subsp. ***arabica***

(a) *Launaea angustifolia* subsp. *angustifolia*

Launaea angustifolia subsp. *angustifolia*

= *Rhabdotheca squarrosa* Pomel in Bull. Soc. Climatol. Alger 13 [Nouv. Mat. Fl. Atl. 2]: 263. 1875 \equiv *Zollikoferia angustifolia* var. *squarrosa* (Pomel) Batt. in Battandier & Trabut, Fl. Algérie Tunisie: 216. 1905. – Holotype: Algeria, Metlili, Pomel (MPU!).

[= *Sonchus libycus* Spach in sched. Balansa, Pl. d'Algerie 1853 no. 1015, nom. nud.].

Ic.: Figs 13j-k.

Description

Plants annual (to paucennial?). Mature innermost *achenes* (they are mature, if their pappus is as long as in the others) always completely glabrous and brown; others densely papillose and papillae on the longitudinal main ribs and, less distinctly, on the secondary ribs being arranged in \pm dense juxtaposition, thus forming a wing, but the papillae are not or only basally connate with each other. *Pappus* apart from the numerous cottony rays, usually with c. 2-6 longer, setaceous inner rays.

Chromosome number: $2n = 16$ were recently reported (Kilian & al. 1995: 274) on Tunesian material.

Distribution and ecology

The typical subspecies is restricted to a rather narrow belt reaching from the Chott el Hodna area, Algeria, along the southern escarpments of the Atlas Mts to about the area of Tarhuna, Libya (see Fig. 98).

The typical subspecies is found preferably on calcareous and particularly on gypsaceous substrates (Le Houérou 1959: 133; Pottier-Alapetite 1981: 113), and on rocky, gravelly or sandy-silty ground in semidesert areas.

Flowering and fruiting material has been collected preferably from March to May. Pottier-Alapetite (1981: 113) reports that the flowering and fruiting time lasts from November to May.

Specimens seen:

ALGERIA: Ain-el-Hadjel, 7.5.1935, *C. Killian* (MPU); Hodna, 1865, *Dukerley* (BR); Bou Saada, sables désert, 11.1903, *Chevallier* (G); *ibid.*, *Battandier* (MPU); *ibid.*, 15.4.1928, *W. Rouseau* (BR); rocher calcaire près Beni-Mora, env. de Biskra, 20.4.1852, *Jamin 263* (FI, FI-W, G, W); graviers de l'Oued-Biskra, à Biskra, 12.4.1853, *Balansa 1015* (BM, C, E, FI, FI-W, G, K, LE, W); Biskra, in glareosis, *Chevallier 143* (G); *ibid.*, 26.3.1909, *Möbius* (FR); *ibid.*, 21.4.1965, *Botschantzev 1598* (LE); S du Djebel Matraf (Dj. Bou Chezala), en face de la fontaine d' Ain-Oumach, pres de Biskra, 22.4.1892, *Neyraut 684* (MPU); near Mchounés, NE of Biskra, 3.4.1922, *Pugsley* (BM).

TUNISIA: 5 km S of Metlaoui, 350 m, rocky desert hills, 7.5.1975, *Davis & Lamond 57421* (BM, E); 6 km SW von Metlaoui an der Straße nach Tozeur, 140 m, 34°19'N, 8°21'E, 10.4.1980, *Podlech 34200* (G, M); Oued Seldja (W Metlaoui), Sand, 16.4.1976, *Möschl & Pittoni* (GZU); 8 km NW Kris (48 km SE Tozeur), 40 m, sandige Schlucht in Sandsteinplateau, 34°04'N, 8°14'S, 9.4.1980, *Podlech 34183* (M); c. 3 km NW Gafsa, 8.5.1994, *Vogt 12675 & Oberprieler 6980* (B); 14 km NE Gafsa an der Straße nach Kairouan, 340 m, 10.4.1980, *Podlech 34249* (M); Gafsa, in collibus aridis, 3.1908, *Pitard 428* (G, L, LY); *ibid.*, in aridis desertis, 4.1909, *Pitard 1024* (G); *ibid.*, 4.1909, *Kralik 1858* (G); *ibid.*, 4.1910, *Pitard 1860* (G); Djebel Tabaga, c. 10 km NE Kebili, 9°00.538'E, 33°45.501'N, 130 m, 11.5.1994, *Vogt 12834 & Oberprieler 7139* (B); El Guettar, 20.5.1884, *Doumet-Adanson & Bonnet* (MPU); Oued Rebaies, c. 20 km W El Hamma, 9°32.313'E, 33°49.382'N, 140 m, 11.5.1994, *Vogt 12886 & Oberprieler 7191* (B); Gabes (Teboulbou), in pascuis deserti,

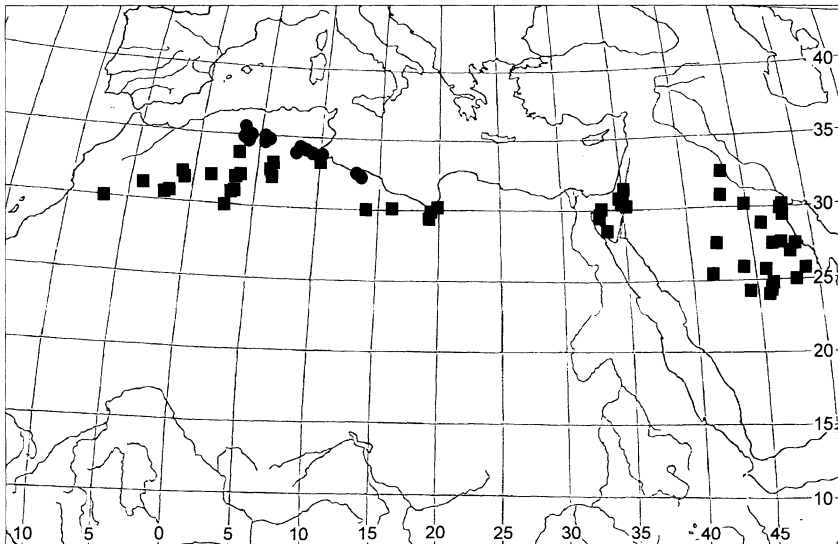


Fig. 98. Distribution of *Launaea angustifolia* subsp. *angustifolia* (circles), and *L. angustifolia* subsp. *arabica* (squares).

3.1907, *Pitard 178* (B, BM, E, G, L, LY, M, MA); Oadi Gabes, 4.5.+18.5.1854, *Kralik* (FI-W); 20 km SSE von Gabes, 20 m, auf Sand, 12.4.1978, *Hautzinger* (W); Sidi-Boul-Baba prope Gabes, in incultis, ad agrorum margines, 7.4.1852, *Kralik 267* (B, BM, G, FI, FI-W, P, UPS, W).

L I B Y A: S and W of Tripoli[s], hard sandy and pebbly plains, 8.1.19[??], *G.F. Scott Elliot 3180* (BM); Uadi el Maader nel Tarhuna, 13.5.1913, *Trotter* (FI).

(b) *Launaea angustifolia* subsp. *arabica*

Launaea angustifolia subsp. *arabica* (Boiss.) N. Kilian in Willdenowia 25: 274. 1995 ≡ *Zollikoferia arabica* Boiss., Diagn. Pl. Orient, ser. 1, 7: 12. 1846 ≡ *Launaea arabica* (Boiss.) H. Lindb. in Acta Soc. Sci. Fenn., Ser. B, Opera Biol. 1(2): 163. 1932. – Syntypes: Saudi Arabia, in regione Hauara [= Hawara], 15.3.1835, *Schimper 208* (G!; isosyntypes: BM!, E!, FI!, K!, KIEL!, L!, LE!, M!, OXF!, W!); *ibid.*, in arena deserti prope Dscheddam, 28.1.1836, *Schimper 827* (G!) [= *L. mucronata* subsp. *cassiana*]. – Lectotype (designated here): *Schimper 208* (G!). = *Zollikoferia foxii* Post, Fl. Syria, ed. 1: 19. 1896 ≡ *Launaea foxii* (Post) Eig in Feddes Repert. Beih. 63(1): 48. 1931. – Holotype: [Israel/Palästine/Jordan], Jebel Usdum to 'Ain-Jidi, 10.4.1895, *Post 740* (BEI; isotype: G!).

Note: Later, Boissier (1875: 823) did not recognize his *Zollikoferia arabica* as distinct from *Sonchus angustifolius* Desf. (= *L. angustifolia* subsp. *angustifolia*); in this publication, furthermore, he did not repeat the quotation of the syntype *Schimper 827* (actually representing *L. mucronata* subsp. *cassiana*). However, Desfontaines' older basionym, which must be adopted if both taxa are considered conspecific, at the same time was rejected by Boissier with the illegitimate argument "nomen antiquius sed omnino improprium".

lc.: Figs 13g-i, 20a, 97.

Description (v.v.)

Annual herb. *Achenes* all densely papillose, papillae connate on each main rib to a hyaline wing of up to c. 0.5 mm in width with the lateral surface smooth and the edges eroded; also each secondary rib with a similar wing, but narrower and papillae less connate. *Pappus* homomorphic, of cottony rays only.

Chromosome number: Counts of $n = 8$ and $2n = 16$ are reported in literature for plants from Morocco, Algeria and Iraq (see Kilian & al. 1995: 274); subsp. *arabica* thus has the same chromosome number as the typical subspecies and other species of the section. The single chromosome number report (giving the same number) published for *L. quercifolia* (see there) is perhaps also referable to *L. angustifolia* subsp. *arabica*.

Distribution and ecology

Launaea angustifolia subsp. *arabica* is widely distributed in the Saharo-Arabian region. However, on the basis of the material seen and the literature consulted, its distribution is not continuous but three somewhat isolated subareas are recogniz-

able (see Fig. 98), i.e. NW-Africa, Sinai and Arava Valley, NE Saudi Arabia and W Iraq).

A distribution map for *L. angustifolia* in NW Africa was given by Zaffran (1967: p. 205, fig. B); the indicated occurrence of *L. angustifolia* in the Tassili N'Ajjer (see also Maire 1933: 220, who cites a specimen from Lac Menkhough, Guichard, n.v.), needs confirmation. On the other hand, the western extension of the distribution area of *L. angustifolia* is larger than though earlier, since the species has been discovered also on the southern escarpments of the Anti-Atlas at Tissint (Kilian 3522).

All over the distribution area the subspecies is frequently found on calcareous substrates (e.g., in sandy pockets on limestone, in limestone rubble, in limy soil) or on gypsaceous substrate, and subsp. *arabica* thus apparently is calceophilous and gypsophilous like the typical subspecies.

The plants flower mainly between January and May.

Specimens seen:

MOROCCO: Südrand des AntiAtlas, 7-9 km E von Tissint, S exponierter, felsiger Hang (Kalk) zum Oued Tissint, in den bodenhaltigen Nischen zwischen den Felsen, 2.5.1994, Kilian 3522 (B, herb. Kilian); Figuig, au col de Zenaga, 24.5.1918, Maire (MPU).

ALGERIA: Hammada du Dra, d'Oum el Asset[?], 6.3.1951, Guinet & Savage 477 (MPU); route d'Abadla à Beni-Abbes, 26.2.1980, Charpin (G); Taghit, 31.5.1952, Guinet (MPU); Beni Oumif, Battandier (MPU); Sid el Hadj ed Din (Ouled Sisi Cheikh), 22°07'N, 1°06'E, in petrosis, 4.5.1866, E.G. Paris 102 (FI, JE, LD, WU); env. de Laghouat, Reboud (MPU); 130 km SW El Golea an der Straße nach Timimoun, 500 m, 30°02'N, 2°21'E, 26.3.1981, Podlech 35295 (M); inter Ghardaia et El Golea, ad loc. dict. "El Gao[?]", 16.3.1902, Chevallier 228bis (LD); inter Ghardaia et El Golea, "El Abiod", 17.3.1902, Chevallier 143bis (MPU); Ghardaia, 19.2.1902, Chevallier (A, P); ibid., 2.4.1965, Botschantzev 987 (LE); ibid., in collibus aridis et ad ripas flucii "O. Mzab", 5.4.1899, Chevallier 338 (JE, WU); ibid., 5.1941, Volkousky (MPU); inter Ghardaia et Melika (M'Zab), 3.1883, Letourneux (G); Zelfana, 55 km ESE von Gardaia, 360 m, 32°22'N, 4°13'E, 30.3.1981, Podlech 35560 (M); de Toughourt à Ouargla, Battandier (MPU); circa Massoud inter castellum Lallemand et Ouargla, 100-120 m, 9.5.1928, Maire 772 (MPU); Touggourt, 4.1892, Doumat (LY); Ain Taiba, 4.1880, Guiareff[?] (P).

TUNISIA: 9 km S Gabes, Boden äußerst flachgründig, Gips, Kalkkruste, 3.3.1968, Leippert 7014 (B).

LIBYA: Tripolitaniens, c. 80 km N Hon, 8.1.1972, Gabriel (B); Tripolitania, Wadi Ghirza, 170 km S Beni Ulid, 150-160 m, in pockets of sand, 9.4.1960, Keith 558,562 (K); Uadi Faregh: Maaten Giofer, 15.3.1933, Pampanini 9166 (G, FI, K); fra l'oasi di Marada e l'Uadi Faregh, a 44 km a S di Maaten Giofer, 13.3.1932, Krüger (FI); fra Agedabia [= Ajdabiyah] e El Agheila, ignotus (FI); 75 miles S of Bou Ngem, 4.2.1952, Guichard KG/Lib/71 (BM); Wadi Kabau, steep valley slope, 5.5.1972, Ali & Khalifa 337 (E).

EGYPT: Sinai, zwischen Wadi Abte[?] & Wadi Sudr, 19.3.1904, Kneucker 4 (B); ibid., Mitla pass, sand over soft limestone, 13.4.1945, P.H. Davis 10480a (K); ibid., Wadi Ghandel, 2.5.1882, Post 220 (BM); ibid., Unterlauf des Wadi Feran, Kalksteinregion, zwischen Geröll und sandigem Grund, 29.3.1893, Kaiser (G); ibid., Wadi Feiran, 3.1928, Meinertzhagen (BM); zwischen Wadi Chawandel und Wadi Werdan[?], 12.4.1902, Kneucker 211 (B); Libein (abadda Edid) gattara, 1928, G. Murray (BM).

ISRAEL: Negev, Wadi Faran, gravel mound on roadside, 3.2.1962, *Zohary* (W); *ibid.*, c. 10 km S of En Hazera, 30°45'N, 35°20'E, 20.3.1987, *Musselman 10245* (E); *ibid.*, Midbar Zin, 12 km NW von Hazeva, Hauptwadi (Nahal Hazeva), Meereshöhe, 1.4.1983, *Bierkamp & Zinth 1286* (BSB); Totes Meer, W-Rand, Nahal Hever, fast geschlossener Schwemmitrichter zum Toten Meer, -300m, 29.3.1983, *Bierkamp & Zinth 1143* (BSB); Judean desert, km 30 on the Jerusalem - Jericho road, in the Chenoleetum arabicae, on white compact gypsaceous soil, 22.130.2.1935, *Eig & Zohary 398* (B, BM, BR, C, COI, E, FI, G, GH, JE, L, LD, LE, MA, S, U, UPS, W, Z); N-Arava, Moshav Hazeva, ruderal in Graben bei Moshav, 11.4.1984, *Bierkamp 84-179* (BSB); Arava Valley, env. of Ein Yahaw, reg plain, 1.4.1981, *Zohary* (Z); Arava Valley, vic. of Moshav Chatzevah, sand desert, -100 m, 24.3.1980, *K.U. Kramer 7178* (Z).

JORDAN: Mittleres Wadi Araba 7 km SW Ain el Fidan, c. 0 m, 11.3.1986, *Baierle & Kürschner 86-415a* (herb. Baierle); Übergang Wadi Araba / Berge von Edom bei Hirbet en-Nahas 5 km ENE Feinan c. 110 m, Rinne in Dolomit-Plateau 27.3.1986, *Baierle & al. 86-1050* (herb. Baierle).

SAUDI ARABIA: Jebel Tamiyah [25°36'N, 41°59'E], 4450ft, sandstone topped isolated hill, 19.4.1981, *Collenette 2437* (K); Hail, 22.-23.3.1978, *Chaudhary* (E); Anaiza, 26°05'N, 44°05'E, rough plain of limestone rubble, 28.3.1946, *Vesey-Fitzgerald 15644/2, 15662* (BM); Dawadimi Camp II, 24°41'N, 44°38'E, 2900', drifted sand in shallow ravine in limestone, 11.3.1983, *Collenette 4111* (E); 12 km from Dawadimi Camp II, 24°46'N, 44°38'E, 3000', edge of irrigated field on limestone plateau, 10.3.1983, *Collenette 4109* (E); Jebel Tuwaiq (Sudair), 25°45'N, 45°45'E, limestone plateau, rubble and slabs, 15.3.1945, *Vesey-Fitzgerald 14644/2* (BM); 36 km SW Hafar al-Batin, 28°10'N, 45°46'E, 27.3.1981, *Hillcoat 349* (BM); Al Amar, 75 miles WSW of Riyadh, 2900ft, 2.3.1983, *Collenette 4036* (K); 30 km SW Riyadh, 27.3.1969, *Mandaville 2422, 2413* (BM); near Riyadh, 24°50'N, 46°45'E, limestone plateau, thin red sand overlying compact gravel, 19.3.1945, *Vesey-Fitzgerald 14660* (BM); Riyadh, 9.1.1983, *Chaudhary & Riaz Bhatti* (RIY); Kkia, Riyadh, 13.1.1983, *Chaudhary* (RIY); Fawwazia, outskirts of Riyadh, 30.3.1980, *Chaudhary* (E); Thumana, c. 80 km N Riyadh, 600-650 m, 20.3.1985, *Baierle & Kürschner 85-105b, -106* (BSB); *ibid.*, 620 m, kleine Rinne am Fuße eines Steilabfalls, 16.4.1985, *Baierle & Frey 85-285* (BSB); 65 km ENE Riyadh, sand on silt, 13.3.1969, *Mandaville 2367* (BM); ash-Shayyit al-'Atshan, 42 km W Qaryat al-'Ulya, sand on limestone, 23.2.1968, *Mandaville 1398* (BM); W of as-Sarrar, 26°58'N, 48°18'E, sand, 14.3.1975, *Mandaville 4141* (BM); Jibal an-Nu'ayriyah, sand on limestone, 26.1.1968, *Mandaville 1213* (BM); E edge of (Jabal) Hamra'judah, 25°55'N, 48°48'E, sandy bank at base of limestone hill, 26.3.1976, *Mandaville 6831* (BM); 5 km WSW An Nazim, sand on limestone, 3.3.1972, *Mandaville 3338* (BM); 29 km ENE Al Hunayy [24°58'N, 48°45'E], sand on limestone, 1.3.1969, *Mandaville 2258* (BM); Arasjan, 1935, *Dickson 114A* (K); Al Touf, 5 miles N of Moo'essin, 2100', on limestone, 30.4.1971, *Ironside Wood 265* (BM).

IRAQ: 13 km W by N of Shabicha, 320 m, compact sandy soil, 25.4.1957, *Guest, Rawi & Reching* (K); 10-15 km SW of Shabicha, sandy gravelly soil, 17.3.1968, *Alizzi & Omar* (K); Karbala Liwa, 32 km W of Karbala, wadi canyon, semi desert, 40 m, 4.5.1964, *M.L.Grant 15685* (W); Al-Aujah, 25 km SW of Salman, 255 m, rocky hills, 20.3.1975, *coll. ignotus* (K); 12 km ESE of Salman, 240 m, rocky limestone hilltop, calcareous soil, 23.4.1957, *Guest, Rawi & Reching* (K); Al Salman, 24.3.1960, *Wheeler Haines* (E); *ibid.*, 18.3.1957, *Wheeler Haines 1935* (E); *ibid.*, c. 30°30'N, 44°30'E, 240 m, in saxosis calc., 22.-23.4.1957, *Reching 9304* (G, LD, M, W); 3 km N of As-Salman, 220 m, 24.3.1960, *Al-Rawi, Khatib & Krity* (K); 5 km from Salman to road to Samawa, 230 m, rocky sandy hillside, 15.2.1978, *Al-Kaisi, Hamad & Hamid* (K); 30 km E As-Salam, 190

m, 22.4.1957, *Rechinger 13902* (W); prope Chilawa, 112 km SSW Basra, 170 m, 25.3.1957, *Rechinger 14410* (W); Jabal Sanam, 50 km SW Basra, 100-150 m, volcanic rocky soil with sandy patches, 17.4.1955, *Guest, Al-Rawi & Schwan* (K, W); *ibid.*, 18.3.1957, *Wheeler Haines 1035* (K); *ibid.*, c. 30°10'N, 47°30'E, 18./24.3.1957, *Rechinger 8571* (B, BM, C, G, GZU, LD, M, MA, S, W), 8732 (G, W); *ibid.*, 2.1919, *R.D. Graham 438* (BM); *ibid.*, 45 m, 26.2.1978, *Al-Kaisi, Hamed & Hamid* (K).

KUWAIT: 1/2 km from Al Ahagaya centre, 4.4.1982, *Jalili 11495* (E); Jal-Az-Zor Hills, 10 km along the road to Sobiyah, 4.5.1981, *Al-Rawi, Jalili & Armer* (M); *ibid.*, 50 km along the Sabiyah highway, rock crevices, 100 m, 24.2.1981, *Rawi & al. 10046* (G), *V. Arnet 61* (E); *ibid.*, Kadhmah, 80 m, 29°25'N, 47°45'E, sand and sandstone, 21.3.1985, *Boulos 15531* (BM, S); Umm Al-Rimam, 70-80 m, 29°30'N, 47°45'E, 1.3.1985, *Boulos & Al-Hasan 15246* (BM, E).

LOCALITY NOT FOUND: "Syria", Wadi Zewerah, 1863-64, *B.T. Lowne* (E, K).

Incertae sedis

ALGERIA: Laghouat, 3.1873, *Maw* (K); *ibid.*, 23.3.1931, *Meinertzhagen* (BM); B 118 km k rory om Laghouat, 8.5.1968, *Rodin & Miroschnitschenko 418* (LE); in ditione Zob Gharbi prope Tolga, 23.3.1933, *Maire* (MPU).

TUNISIA: Bezirk Medenine, Sebka Gourine, 1978, *S. Cramer 67* (B).

LIBYA: Prope Casa Ristoro, in Magnas Cyrteos, 29.4.1938, *Maire & Weiller 993* (MPU).