

Due to the usually rather vigorous habit and the fairly large capitula *L. omanensis* resembles species of the *mucronata* group and is commonly misidentified with in particular *L. mucronata*.

### Distribution and ecology

The species seems to be restricted to the eastern escarpments of the E Oman mountain chain and its coastal plains (Fig. 89). *L. omanensis* is found there from sea level up to 1800 m; the collectors often mention rocky slopes as the habitat.

Flowering and fruiting material dates from March and April.

Additional specimens seen:

OMAN: W al Hajr Mts., Wadi el Gawr, 25°00'N, 56°00'E, hillsides, 17.2.1944, *Vesey-Fitz-Gerald 13244/1, 13244/2* (BM); Dhahirah, Wadi Fida below Yanqul [= Khabura Yanqul], 450 m, limestone slopes, 12.3.1980, *Edmondson 3355* (E); vicinity of Samail, 23°18'N, 57°56'E, c. 1000', rocky hillside, 20.4.1975, *Mandaville 6692* (BM); E. Batinah, 5 miles SE of Seeb [= Sib] Int. airport, wadi-bed, 26.2.1976, *Radcliffe-Smith 3646* (K); vicinity of Sib, 23°40'N, 58°12'E, 50', sand, 20.4.1975, *Mandaville 6702* (BM); Wadi Qid, 23°12'N, 58°37'E, 1500-1700', rocky hillside, 24.4.1975, *Mandaville 6822* (BM); c. 10 km W of Muscat, sandstone cliff at beach, 18.3.1975, *Rubens 91* (E); Muscat, Wadi Wattiyah, 15m, 14.2.1983, *Frey & Kürschner 83-69* (BSB); *ibid.*, Wadi Sarooj, 15-50m, Kalkhang, 15.2.1983, *Frey & Kürschner 83-144* (BSB); *ibid.*, 40-140m, 21.2.1983, *Frey & Kürschner 83-416* (BSB); Muscat, Ruwi Richtung Al Bustan, 100-300 m, 22.2.1983, *Frey & Kürschner 83-442* (BSB); Ruwi, in valley W of town, on igneous rock outcrop, 100', 11.4.1976, *Radcliffe-Smith 4193* (K); *ibid.*, on gravelly & rocky banks of wadi bed NW of the town, 100', 26.2.1976, *Radcliffe-Smith 3671* (K); Saiq ministry of agriculture farm, 1800 m, 18.2.1980, *Whitcombe 741* (E); Jabel Fayah, sandy soil, 2.1952, *Lee-Oldfield FNLO.100* (BM).

### (8) *Launaea amal-aminae*

*Launaea amal-aminae* N. Kilian, **sp. nova** – Holotype: Algeria, 32 km S von Abadla an der Straße nach Beni Abbes, 610 m, sandiger Straßenrand, 30°46'N, 2°44'W, 4.4.1980, *Podlech 33787* (M!), isotypes G!, M!).

[= *Launaea cassiana* var. *marginata* Maire in Bull. Soc. Hist. Nat. Afrique N. 24: 221. 1933, p.p. [non sensu typi]].

[= *Launaea procumbens* sensu Alavi, Fl. Libya 107: 383, p.p. [non sensu (Roxb.) Ramayya & Rajagopal]]

A *Launaea almahrahensi* valde simili involucro minore (per anthesin 7-9 versus 9-11 mm, in statu fructifero usque ad 11(-12) versus 13(-16) mm longo), achae-niis marginalibus apicem versus attenuatis vel cuspidatis apice papilloso (versus breviter rostratis rostro glabro), papilloso-pubescentibus (versus dense papillosis) et papillis typi majoris 0.04-0.08 mm (versus 0.1-0.2 mm) longis distinguitur.

**Ic.:** Figs 12a-f, 19a, 91.

### Description (v.v.)

*Perennial herb*, flowering c. 20-25 cm high, with a basal leaf rosette and several leafless, divaricately branched, procumbent to ascending, greyish-glaucous flower-

ing stems. *Rosette leaves* 3-10 × 1.5-3 cm, deeply pinnatifid to bipinnatifid with rounded segments and denticulate margin, in outline spatulate with a narrow terminal segment and tapering into a narrow base; stems with cordate, ovate-acute bracts only. *Synflorescence* of a flowering stem in the lower part usually monopodially, higher up monochasially branched with the terminal capitulum overtopped by the (upper) branches, with several capitula single at the end of the axes. *Peduncles* as the terminal part of the flowering axes wiry, 0.7-3.5 cm long, below the capitulum with a few bracts passing over into the outermost involucre bracts. *Capitula* with c. 20-30 flowers. *Receptacle* at fruiting time ± 2 mm in diameter. *Involucre* slender, at flowering time 7-9 mm long, prolonged after anthesis, at fruiting time narrowly cylindrical, up to 8-11(-12) mm long; involucre bracts mucronate, the outer (and often also the inner) with white-cartilaginous tips, at time of fruit dispersal involucre bracts spreading and their midrib in lower half swollen and hardened; outer involucre bracts c. 6-9, the outermost ovate-acute, cordate, ± 2 mm long and little narrower, the following bracts longer and spatulate, the innermost ± linear-lanceolate, usually 1/2-c. 2/3 of the length of the inner involucre bracts; inner involucre bracts c. 7-10, linear-lanceolate, 8-11 × 1-2 mm, subequal at anthesis, at fruiting time the innermost somewhat longer than the others. *Flowers* with a yellow ligule of 5.3-7.5(9) × 1.5-2.6 mm and a tube 3-4 mm long; anther tube without appendages 2.0-2.4(-2.6) mm long, apical appendages 0.2-0.4 mm and basal appendages 0.3-0.4 mm long; style branches 1.6-2.0 mm long, sweeping hairs yellow. *Achenes* 2.5-5.1 × 0.3-0.5 mm, ± darkish brown, inner columnar to slightly fusiform (but stronger tapering towards apex than towards base), slightly prismatic, with 4 main ribs each accompanied by 2 secondary ribs, ribs very finely white-squamulose wrinkled; marginal somewhat shorter, slightly curved and slightly compressed, ± 5-angular, with 5 main ribs each accompanied by 2 secondary ribs, with both minute, dustgrain-like as well as patent, 0.04-0.08 mm long papillae, otherwise like inner. *Pappus* 4-8 mm long, ± deciduous, white, dimorphic, of downy and a similar number of setaceous, longer rays, or occasionally (sub)homomorphic (almost) of setaceous rays only.

**Note:** This widely distributed (but apparently rare) species is commonly confused with *L. mucronata*. Only A. Amin recognized it as a distinct and undescribed species (annotation on a single specimen at G). Even in the field both species may sometimes strongly resemble each other at first sight. *L. amal-aminae* can, however, readily be distinguished by its leafless flowering stems, the tiny, slender capitula, and the slender achenes with their different indumentum.

**Chromosome number:** Unknown.

### Variability

Besides the usual variability caused by environmental factors and influencing the total size of the plants and the amount of branchings, the architecture of the species is rather constant. It is a perennial herb with a basal leaf rosette and mostly several, divaricately branched, procumbent to ascending, leafless flowering stems. As a specimen from Mauritania (*Chudeau*, 4.2.1908) indicates, root-



Fig. 91. *Launaea amal-aminae* -- habit (after Podlech 33787 and 33260, G). -- Drawing by Catherine Dervin.

born innovations from the taproot occur in case of the loss of the main shoot. Even the leaf shape does not seem to vary in a more conspicuous way. Taking the leaves pictured in Fig. 91 as characteristic, they vary, apart from their total size, mainly in the length and width of the segments and whether or to what extent they are bipinnatifid.

The involucre of *L. amal-aminae* is smaller than in its three allies *L. almahra-hensis*, *L. omanensis*, and *L. quettaensis*. Its inner involucreal bracts usually show quite characteristic longitudinal, blackish stripes.

Comparatively large flowers have been observed in material from Hoggar, Algeria.

The achenes are never rostrate but mostly have a subtruncate to cuspidate apex (distinctly cuspidate e.g. in *Bornmüller 10829* from Suez). The pappus usually has the tendency to fall off easily and is dimorphic, but occasionally, as in *Maire 762* from Hoggar, Algeria, and in *Kilian 3503* from S Morocco, it is almost or entirely homomorphic, having only very few downy rays or none at all.

### Distribution and ecology

The distribution of *Launaea amal-aminae* extends from the western mountains of the Arabian Peninsula across the Sahara to the Atlantic coast (Fig. 92).

The species is found from sea level (at Suez, Egypt, El Arîsh, Sinai, and Nouakshott, Mauritania) up to altitudes of more than 2000 m (Hoggar Mts, Algeria, and in the mountains of W Saudi Arabia). By far the most collections made in the Sahara are from the Hoggar Mts, whereas I did not see a single gathering from the Tibesti Mts.

Flowering and fruiting material has been collected between October and December, but mostly between February and May.

Additional specimens seen:

MOROCCO: Oase Kasba-*ej-Joua*, c. 20 km W von Tissint an der Straße nach Tata, Dattelpalmenhain, auf Sand, 1.5.1994, *N. Kilian 3503* (herb. Kilian).

WESTERN SAHARA: Ezmul Agazel [= Aghassal], 18.3.1946, *Agarino* (MA).

MAURITANIA: Nouakchott, direction of the sea, 22.12.1962, *Arvidsson 93* (K); entre Ijdez et Nouakchott, 4.2.1908, *Chudeau* (P); entre Toueil [c. 18°20'N, 15°45'W] et Bilauville[?], 20.2.1908, *Chudeau 421* (P); El Makar (R. Gueibat), El Hafera, *Puiggandean* (P).

ALGERIA: Hamada du Draa, à env. 150 km NE de Tinfouchy [c. 29°30'N, 4°30'E], 27.2.1951, *Guinet & Sauvage 289* (MPU); 14 km S von Abadla, 610 m, 30°57'N, 2°44'E, 4.4.1980, *Podlech 33792* (M); 165 km ENE Timimoun an der Straße nach El Golea, 380 m, breites, sandiges Oued, 29°49'N, 1°57'E, 26.3.1981, *Podlech 35249* (G, M); in mont. Atakar-n-Ahaggar in secus amnem Ilaman, 2000-2100 m, 4.3.1938, *Maire 760* (MPU); Hoggar, Guelta Im Laoulaoune NE Tamanrasset am Weg zum Assekrem, 1510 m, Sand und Felsen, 22°53'N, 5°37'E, 24.3.1980, *Podlech 33286* (M); *ibid.*, in alveos arenoso limoso amnis Outoul, 1450 m, 5.3.1928, *Maire 769* (MPU); *ibid.*, Ar-Makhez, *Laperrine* (MPU); *ibid.*, Umgebung der Source Chapuis, 16 km NE Tamanrasset, steiles Felstal, 1510 m, 23.3.1980, *Podlech 33282* (M); Tamanrasset, 1450 m, 30.10.+3.11.1940, *H. Lhok 105*, 159 (MPU); *ibid.*, *ibid.*, 4100', open desert, 15.2.1931, *Meinertzhagen 79a* (K), 79 (BM); *ibid.*, 12.5.1933, *Lauriot* (MPU); *ibid.*, 1100 m, 8.1905, *Chudeau* (MPU); *ibid.*, 11.1953, *Quézel* (MPU); *ibid.*, Tankstelle am südlichen Ortsausgang, 1390 m, Sand, 22°47'N, 5°32'E, 23.3.1980, *Podlech 33260* (G, M); Oued Tamanrasset, 4600', 18.2.1931, *Meinertzhagen 67* (BM, K); Tezzeit, in alveis glareosis amnium, in lapidosis basalticis secus amnem, 1700-1800 m, 4.4.1938, *Maire 762* (G, MPU).

LIBYA: Tripolitania, fra Scineref e El-Gheriat [= Al Qaryah & Shuwayrif], 11.3.1932, *Pargagli-Petrucci* (FI); Syrte, fra L'Oasi di Marada e l'Uadi Faregh, a 75 km a S di Maaten Gofar, 13.3.1932, *Krüger* (FI); Cyrenaica, zona desertica fra Giarabub [= Al Jayhub] e Fortino Madalena e Amseat, 28.3.1937, *Serv. Agrar. Ciren. 52* (FI); Sceggal[?], 5.8.1925, *Krüger* (FI).

EGYPT: Nelle sabbie del desert orient d'Egitto Baysa Tebaide, 4.18??, *Figari* (FI); SW von Suez, 14.5.1886, *Schweinfurth* (MPU); Suez, in desertis lapidosis "Wadi Tour", 20.5.1908, *Bormmüller 10829* (B); in deserto, isthmi prope El Arych, 24.3.1855, *Kotschy 1186a* (W); Sinai, *A. Kaiser 305a* (G); Sinai, nelle sabbie delle alte vallate, 3.1849, *Figari* (FI); zwischen Kossier und Ras Benass, Wady Tundebar, 4.4.1864, *Schweinfurth 468* (BM, P).

SAUDI ARABIA: Jeddah, ditch between new airport and Medina road, sand over fossil coral, 80', 13.3.1979, *Collenette 1038* (K); 10 km N W Taif (21°21'N, 40°20'E),

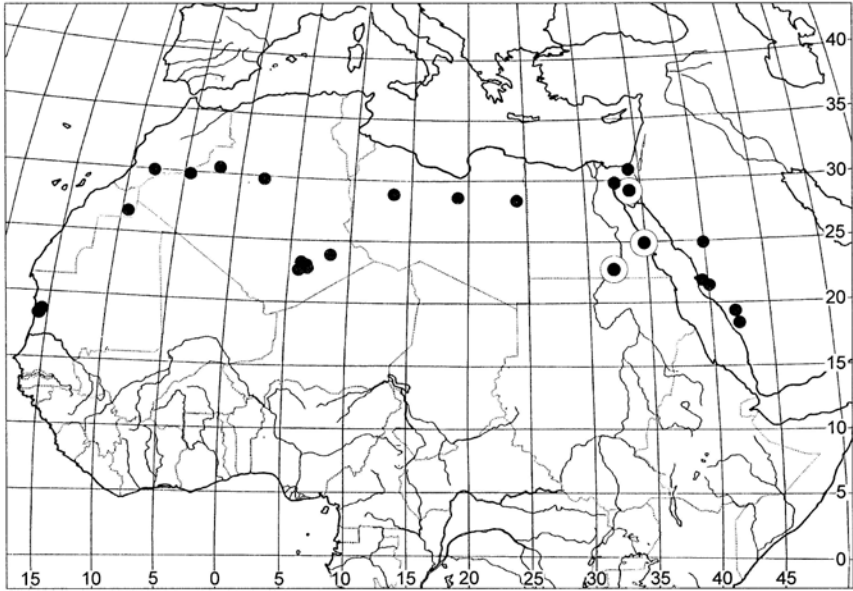


Fig. 92. Distribution of *Launaea amal-aminae*; encircled solid circles: collection without precise locality.

1800 m, Hang, S-Exposition, Schiefer, 23.3.1982, *Baierle, Frey & König 82-666* (BSB); *ibid.*, Schiefer, Hang, S-Exposition, 23.3.1982, *Baierle, Frey & König 82-664* (BSB); Harrat Khaybar, c. 12 km SSW of Jabal Abyad, 5.3.1986, *Collenette 5670* (K); 20 km NE Al Alayyah, [19°43'N, 41°55'E], 1750 m, 18.4.1982, *Baierle & König 82-1852* (BSB); Asir Prov., 25 km S Khamis Mushayt, E road to Habella village, rocky region, 2200 m, 11.11.1978, *Fagerström 3* (S); Najran: Jebel Manfah, 12.3.1980, *Lavranos & Collenette 18317* (E).

Y E M E N: Zona delo Campo Furlanis, 17°07'N, 43°34'E, graniti a W del Campo. oltre le montagne calcaree, 14./15.11.1979, *Steinberg 138, 200* (FT).

### (9) *Launaea quettaënsis*

*Launaea quettaënsis* N. Kilian, **sp. nova** – Holotype: Pakistan, Quetta, Gumbaz, 30°02'N, 69°00'E, 16.5.1965, *Rechinger 29632* (W!), isotypes: B!, G!, M!). – Fig. 93. [= *Launaea cassiana* sensu Rech. f., *Fl. Iranica* 122: 158. 1977, p.p. [non (Jaub. & Spach) Kuntze]].

Herba perennis tenuis usque ad c. 20 cm alta, solum basaliter foliacea, caulibus floriferis ascendentibus divaricate ramosis et capitulis gracilibus habitu *Launaea amal-aminae* similis sed involucris majoribus (12-14 versus 8-11(-12) mm in statu fructifero longis), achaeniis longioribus (> 6 mm versus 2.5-5.1 mm longis),

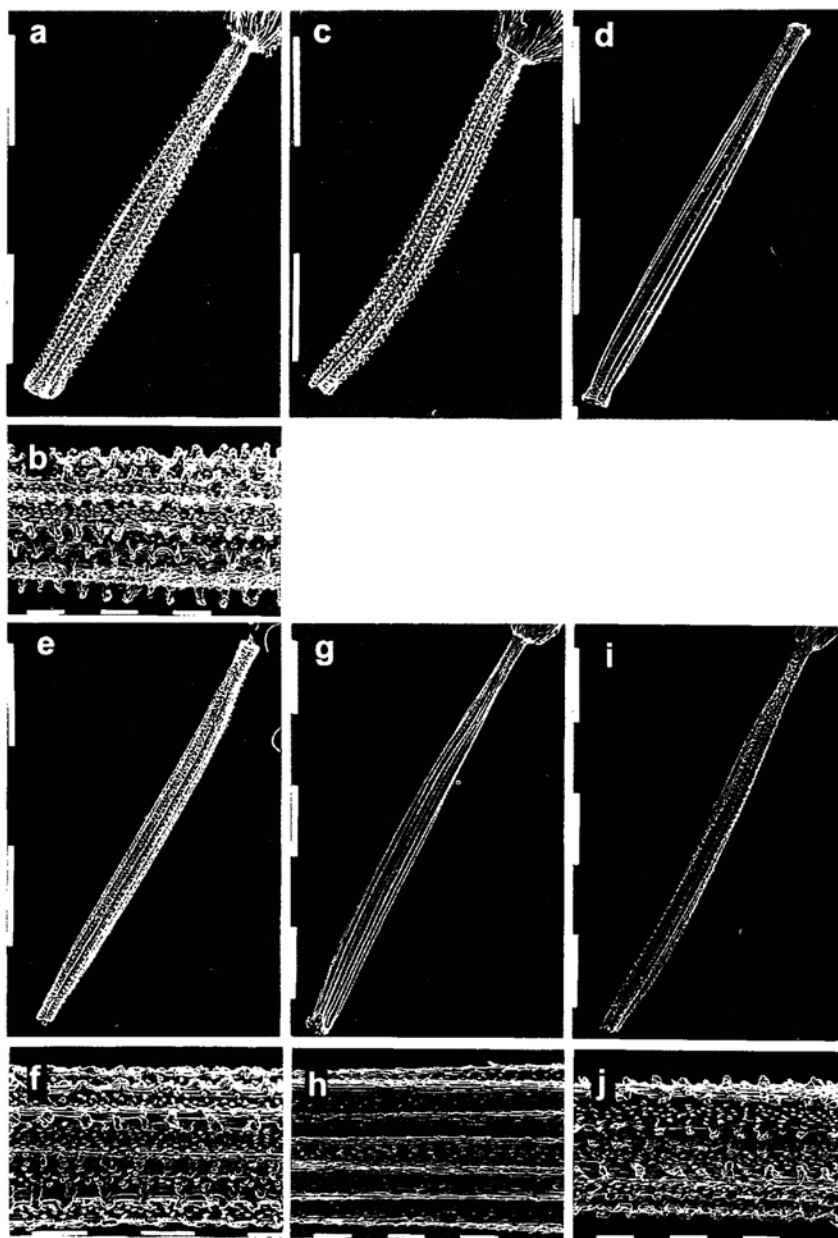


Fig. 12. SEM micrographs of *Launaea* achenes – a-f: *L. amal-aminae*, inner (a-b), marginal (c) (*Podlech* 33787, M), inner (d), marginal (e-f) (*Podlech* 33286, M); g-j: *L. quettaënsis*, inner (g-h), marginal (i-j) (*Rechinger* 29632, W). – Scale: 1 mm (a, c-e, g, i) and 0.1 mm (b, f, h, j).

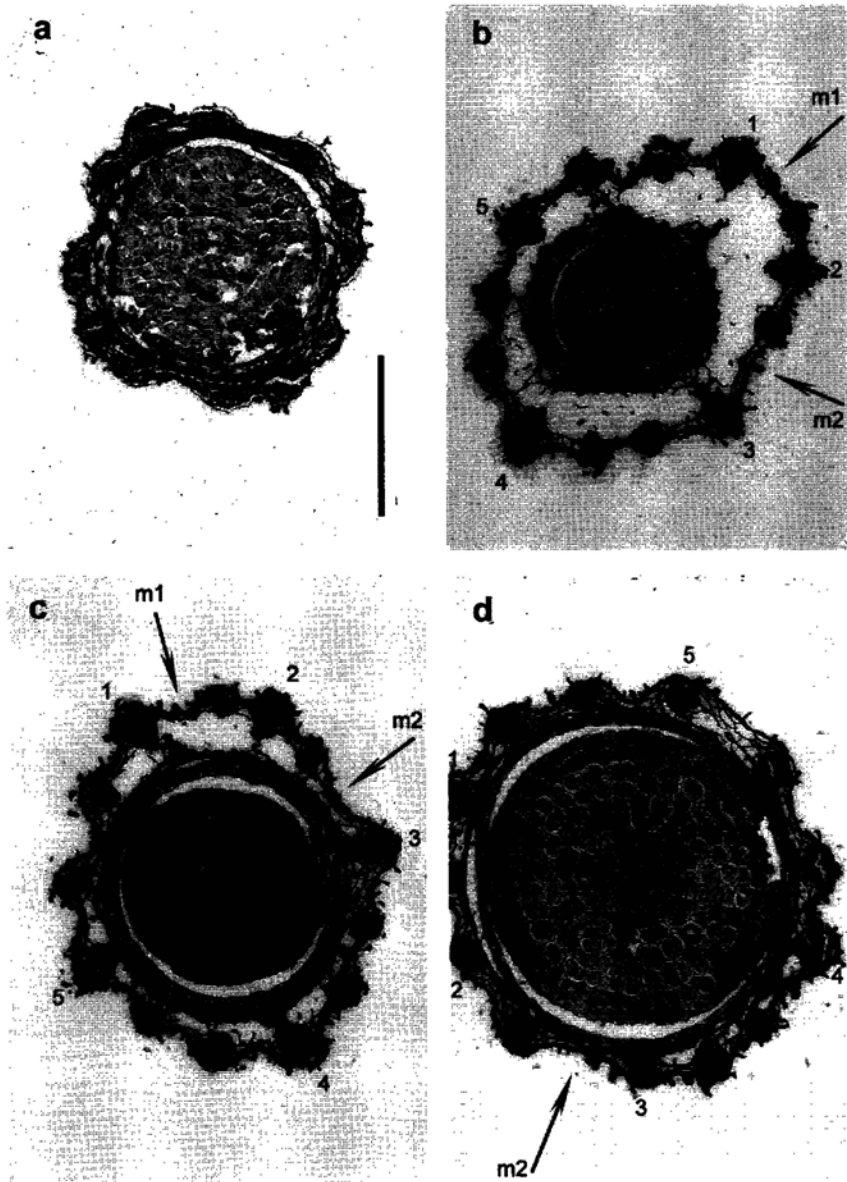


Fig. 19. Cross sections of *Launaea* achenes – a: *L. amal-aminae*, inner (Podlech 33286, M), b-d: *L. benadirensis*, marginal, sequence of sections from near base to middle third illustrating irregular ribbing pattern: secondary strands (m1+m2) only rudimentary (b), higher up almost (c) and completely lost (d) causing pericarp deformation (left of principal strand no. 5) (Gabriel s.n., B). – Scale: 0.2 mm.