

**(6) *Launaea lanifera***

- Launaea lanifera* Pau in Mem. Mus. Ci. Nat. Barcelona, Ser. Bot. 1(3): 23. 1925.  
– Holotype: Spain, “inter Almeria et Agua Dulce in rupestribus maritimus”, 5.4.1921, Gros 471 [specimen annotated “*Launaea lanifera* n. sp.”/“Mi planta típica!! C. Pau”] (MA! [ex BC no. 139644]) – Fig. 60.
- = *Lactuca spinosa* Lam., Encycl. 3: 408. 1792, emend. Desf., Fl. Atlant. 2: 227. 1799 ≡ *Launaea acanthoclada* Maire in Bull. Soc. Hist. Nat. Afrique N. 17: 119. 1926 ≡ *Launaea spinosa* subsp. *acanthoclada* (Maire) Ozenda, Fl. Sahara: 460. 1958. – Lectotype (designated by Kilian 1988: 139): Specimen in herb. Lamarck labelled “*Lactuca spinosa* Lam. Dict.”/ “*Lactuca spinosa* h[ortus] R[egalis] ex D. Desfontaines fl. lutei” (P [IDC mf. 6207: 391, 2. row, 1. from right]); isotype MPU! (ex herb. Cambessèdes).
- = *Sonchus spinosus* var. *commutatus* Willk., Suppl. Prodr. Fl. Hisp.: 114. 1893. – Lectotype (designated here): Spain, Sierra de Gador, pr. Almeria, 12.1851, *J. Lange* (C!; isolectotypes: K!, P!).

For nomenclatural notes see Kilian (1988: 135-136).

**Ic.:** Figs 2b, 7d-f, 16c, 60. – Beniston & Beniston 1984: p. 300 sub *L. acanthoclada* (habit); Kunkel & Kunkel 1987: p. 135, fig. 101 (synflorescence); Sagredo 1987: p. 497 sub *Launaea acanthoclada* (synflorescence); Mateu & Güemez 1995: fig. 1(7-8), 2(4) (achenes). – Further references quoted by Kilian (1988: 140).

### **Description** (v.v.)

*Cushion forming, spinescent rosette shrublet* up to c. 40 cm high, with a strong taproot and a shortly branched, woody caudex carrying several, closely neighbouring leaf rosettes; axils of the former and present rosette leaves with a persisting white-lanate indumentum; rosette shoots terminated each by a spinescent, from base on intricately and divaricately branched, lignified, leafless synflorescence intermingled with the others and thus together constituting a persistent, spiny cushion; innovations from the axils of rosette leaves protected by the spiny cushion and later overtopping it with their synflorescences. *Rosette leaves* obovate to broadly spatulate in young stage of rosette, later  $\pm$  narrowly spatulate in outline, (3)5-20  $\times$  0.3-2 cm, with  $\pm$  acute apex, long-attenuate towards base,  $\pm$  denticulate and sinuate-dentate to pinnatifid with triangular-acute segments, lamina dark green on upper and paler green on lower surface, leaf base semi-amplexicaule,  $\pm$  persistent; above the often somewhat prolonged rosette, leaves immediately reduced to inconspicuous ovate-acute bracts. *Synflorescence* of a rosette shoot basally monopodially and higher up monochasially branched; branches in their majority enclosing an angle of 50-80°; monochasial flowering branches characteristically  $\pm$  zick-zack. *Peduncles*, being the terminal segments of a synflorescence branch, slender, subulate, lignified, spreading-erect, or arched-erect in case of longer peduncles, 0.5-3(5) cm long, with one or a few bracts immediately below the capitulum and passing over into the outer involucre bracts, on longer peduncles with one or few additional bracts further down; peduncles remaining as spines after shedding of the capitula. *Capitula* with 15-24 flowers. *Receptacle* at fruiting time 2-3 mm in diameter. *Involucre* 11-16 mm long, towards fruiting time slender-cylindrical, at time of fruit dispersal involucre bracts star-wise outspread and their midrib in lower half swollen and hardened; outer involucre bracts imbricate, with distinct, broad scarious margin, the outermost ovate-acute to narrowly triangular, mostly twice as long as wide, 1.5-2.5 mm long, the following bracts gradually longer and lanceolate to linear-lanceolate, the innermost 1/3 to 1/2 as long as the inner involucre bracts; inner involucre bracts 8, in one row, with a scarious margin almost as broad as in the outer involucre bracts, linear-lanceolate,  $\pm$  equal, 11-15  $\times$  2-3 mm. *Flowers* with a bright yellow ligule of 10-13  $\times$  2.2-2.8 mm and a tube 5.5-7 mm long; anther tube without appendages 3.6-4.0 mm long, apical appendages 0.4-0.6 mm, basal appendages 0.4-0.6 mm long; style branches 2.6-3.2 mm long, with yellow sweeping hairs. *Achenes* (3.2)4.4-6.2  $\times$  0.7-0.9 mm, heteromorphic, inner columnar, prismatic, with 4 main ribs each accompanied by 2  $\pm$  indistinct secondary ribs, smooth to slightly transversally wrinkled with roundish wrinkles, pale; marginal with 5 main ribs each accompanied by 2  $\pm$  distinct secondary ribs,  $\pm$  columnar,

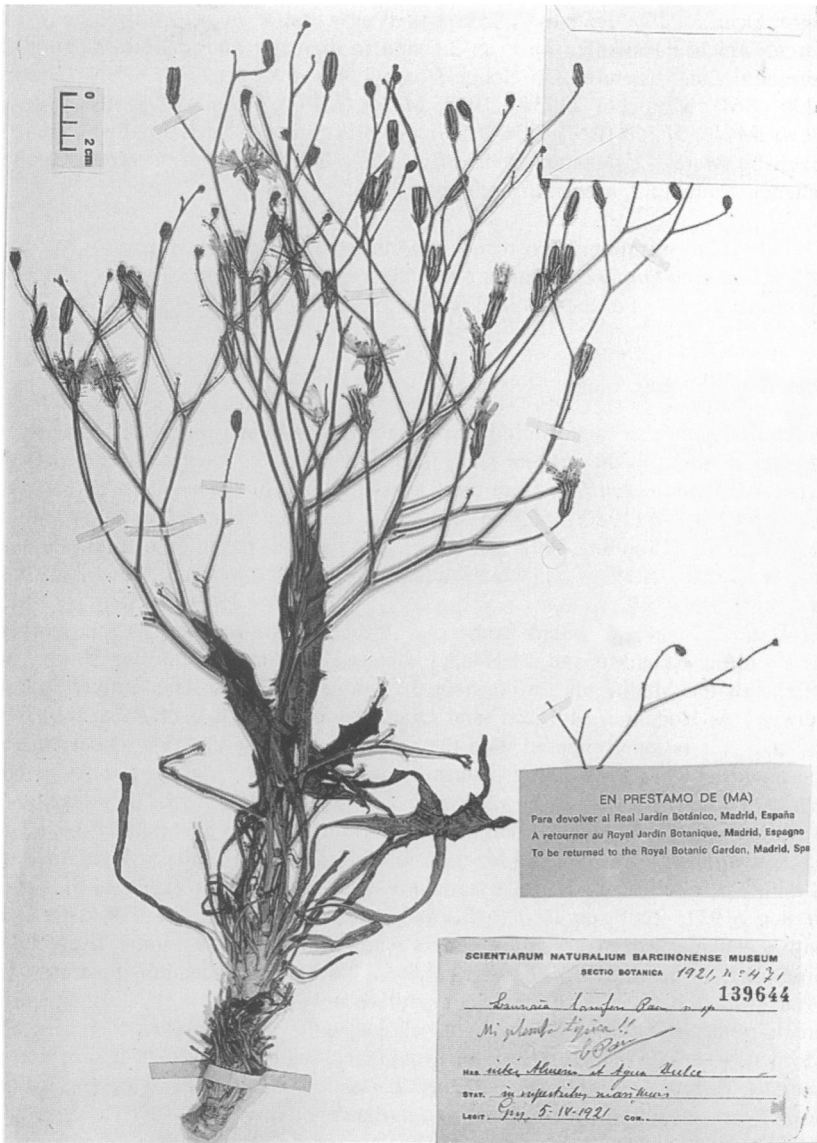


Fig. 60. *Launaea lanifera* (holotype specimen).

weakly compressed and somewhat curved, usually densely and distinctly transversally wrinkled, pale to brownish or greenish. Pappus 6-8 mm long, dimorphic, of numerous downy and a smaller number of inner, setaceous rays.

**Note:** Occasionally, achenes galled through infection of an unidentified insect are found, which are swollen up to c. 2.5 mm in diameter and smooth, lacking the normal surface structure (e.g., Spain: *Huter, Porta & Rigo 195, 315* (BM), *Sennen 6236* (BM), Morocco: 28./31.5.1918, *Maire* (MPU), *Kilian 3598* (B), Algeria: *Davis 51618, 58760* (BM), *52452* (E)). An illustration of such a galled achene is given by *Mateu & Güemez* (1995: fig. 1(8)). Exactly the same type of galled achenes occurs in *L. nudicaulis* (see there).

**Chromosome number:** Two recent reports from Spain and Morocco give  $2n = 18$  for *Launaea lanifera*, whereas two older reports of deviating numbers are due to misidentification of the material studied (see *Kilian & al. 1995: 276*).

### Distribution and ecology

Previously published distribution maps (quoted by *Kilian 1988: 140*) have largely been confirmed by the present study (see Fig. 55). The exception concerns the report of *Launaea lanifera* from the Canarian island of Fuerteventura, first published by *Kunkel* (1980: 350, see also 1991: 162) and repeated by other authors (e.g., *Hansen & Sunding 1993: 50*) since. This report is based on a specimen from Jandía (*Kunkel 12590, G!*), which actually represents aberrant broad-leafy material of *L. arborescens*.

*L. lanifera* is distributed from SW Morocco eastwards across the southern chains of the Atlas Mts and the Hauts Plateaux almost to the Tunisian border, and it reaches the Mediterranean coast in the wider region of the Moulouya mouth between Al Hoceima, Morocco, and Oran, Algeria, which is characterized by a lower precipitation compared with the adjacent coastal areas. The occurrence in the latter area is a distribution pattern common to other *Launaea* species in NW Africa, i.e. *L. arborescens*, *L. nudicaulis* and *L. fragilis*, and like these species it is furthermore distributed beyond the Mediterranean Sea in SE Spain.

*L. lanifera* grows from sea level up to almost 2000 m in the S Atlas Mts, and is a little competitive, heliophile xerophyte of open vegetation types. In SE Spain, *Freitag* (1971: 226f sub *L. acanthoclada*) found the species restricted to areas with a annual mean precipitation of less than 450 mm and preferably growing on limestone, in crevices of other rock material and on gypsaceous substrates. On even ground it was found to be competitive only in areas with a annual mean precipitation of below 300 mm. This agrees with what I could observe in SW Morocco; there it occurs on limestone rockfaces, steep rocky slopes and in similar habitats. Except on limestone rockfaces of rather small extent, the species has never been seen to play a dominant role in the vegetation.

Like in other spinescent *Launaea* species, the lignified spiny synflorescences of past flowering periods protect the young innovations growing from inside the spiny cushion. Because of this protection it is no surprise that *L. lanifera* is rather common in pasture areas. A detailed analysis of its growth and in particular of its pseudo-spines has been provided by *Rauh* (1942: 159f sub *Zollikoferia spinosa*).

Flowering and fruiting time is in spring, thus chiefly between April and June. Some data on its reproductive ecology are given by *Mejías* (1994).

Specimens seen (further collections cited in Kilian 1988: 140):

SPAIN: Regn. Granat., 1837, *Boissier* (W). – PROV. GRANADA: Bei Malaga, Felsspalten, 23.7.1951, *Rauh 103* (M); nr. Almunecar, 4.1931, *Gourlay, Richards & Tutin 581* (BM); *ibid.*, 14.4.1952, *H. Roivainen* (BC, S); Steilküste bei Motril, 28.7.1951, *Rauh 92* (M); W Motril, 4.1963, *Delyosalle* (BR); Cabo Sacratif, 100 m, 10.3.1984, *Navarro & al.* (MAF); inter Torrenueva et Calahouda, 26.6.1970, *E. & G. Wängsjö 3720* (LD); 7 km E Castell de Ferro, 10 m, 6.6.1973, *Podlech & Lippert 25122* (BR, C, G, L, LD, M, MA, MAF); Castell de Ferro, 5.1965, *J. Borja* (BR, G, MA, MAF, UPS); E Castell Ferro, 13.4.1968, *Merxmüller & Lippert 23379* (M); 2 km E Melicena, 20 m, 6.6.1973, *Podlech & Lippert 25128* (M); Schlucht des Rio Albulon, W Albulon, 350 m, 16.4.1973, *Merxmüller & Gleißner 29183* (M); Lanjaron prox. Cerro Escolta, 750 m, 24.5.1979, *Molero* (MA). – PROV. ALMERÍA: Almeria, 2.4.1876, *E. Hackel* (W); Motril - Almeria road, 200 m, 7.6.1963, *C.M. Stocken 218.63* (E); Adra, 20.3.1971, *Fernández Casas* (MA); 3 km from Alcolea, 950', 37°10'N, 3°55'W, 17.4.1980, *Reading M. Sci. Exp. 312* (BM); near Abia between Guadix and Almeria, 2400', 4.5.1951, *A.H.G. Alston 10887* (BM); 10 km S of Berja, 12.4.1973, *Leadley & al. 58* (BM); near Berja, 17.6.1926, *Wilmott & Lofthouse* (BM); coteaux de Doña Maria, 6.1896, *Rouy* (LY); Castala, 950 m, 17.6.1984, *Segura Zubizarreta 27425* (M, MA); slopes of Sierra de Gador, 200', 21.4.1961, *C.A. Stace 116* (BM); Gergal, route Granada - Almeria, 1500 m, 6.2.1982, *C. Evrard 9462* (BR); Alhama, 29.6.1950, *H. Roivainen* (S); Lucainena de las Torres, 35 km NE Almeria, 25.4.1957, *Stud. Biol. Rheno-Trai. [57-]598* (U); Aguadulce, 50 m, 18.3.1984, *Mateo & Lázaro* (MA); *ibid.*, 14.4.1970, *Fernández Casa* (MA); peñascos por la carretera de Enix, 5.1959, *Losa España* (MAF); Roquetas del Mar, 10.4.1974, *P.J.M. & H. Maas 982* (U, Z); *ibid.*, 13.3.1952, *H. Roivainen* (UPS); Velez-Ruvio, 500 m, 6.1899, *Reverchon 683* (E); 10 km W Almeria, 27.3.1971, *Breckle 923* (L); Almeria, 3-5 km W, 18.4.1975, *H. del Villar* (MAF); 3 miles W of Almeria, 29.5.1924, *Ellman & Hubbard 908* (K); Almeria, 24.4.1889, *Reverchon* (E); *ibid.*, 28.4.1883, *H. Nilsson 290* (LD); *ibid.*, 17.5.1887, *Rouy* (LY); *ibid.*, 12.5.1889, *Rouy* (LY); *ibid.*, 2.4.1876, *Winkler* (M); *ibid.*, 20.4.1936, *B.K. Boom 11621* (L); *ibid.*, 18.6.1961, *Burgeff 185* (M); *ibid.*, 100 m, 1.6.1967, *P.W. Ball & al. 37* (BM, LIV); *ibid.*, 18.4.1960, *D.J. Glanville 184* (BM); Cabo de Gata, 11.3.1984, *Navarro & al.* (G, GZU, MAF); *ibid.*, S[?] *R. Clemente* (MA); *ibid.*, 28.4.1965, *Greuter 6998* (LD, W, herb. Greuter); *ibid.*, 18.4.1987, *Villanueva 679EVG & Benítez* (MA); *ibid.*, 4.4.1983, *G. Mateo* (MA); *ibid.*, 22.4.1981, *Cátedra* (MAF); *ibid.*, 20 m, 24.4.1970, *Segura Zubizarreta 9594* (M); Sierra de Cabo de Gata, 16.1.1944, *Rivas & al.* (MA); *ibid.*, 2.5.1972, *Valdéz Bermejo* (MA); *ibid.*, 13.4.1968, *Merxmüller & Lippert 23401* (M); San José in Sierra de Gata, 21.5.1925, *Lacaita 58/25* (BM); Barranco de la Majona, 19.4.1932, *Jerónimo 8282* (BC, G, MA, MAF, W); Barranco de Caballar, 21.12.1851, *J. Lange 285* (C, UPS); *ibid.*, 30.4.1928, *Ellman & Sandwith 870* (G, K); *ibid.*, 21.4.1932, *G. Kretschmer* (S); *ibid.*, 19.4.1975, *H. del Villar* (MAF); Sierra de Filabres, Benizalón, 800 m, 5.5.1988, *Robles & Morales* (MA); westlichste Ausläufer der Sierra Alhamilla, 14.4.1968, *Merxmüller & Lippert 23415* (M); an der Straße von Huercal-Overa Richtung Almeria etwas S der Paßhöhe, 190 m, 22.5.1983, *Bayer, Grau & Lopez* (M); near Tabernas, c. 1000', 21.5.1969, *Townsend 1038* (BM); *ibid.*, 4.1959, *J. Borja* (MAF); Sierra Cabrera, Carboneras, 17.2.1973, *Garcia Arenal* (MA); Carboneras, 200 m, 37°2'N, 1°51'W, 12.4.1982, *M.F. & S.G. Gardner 1580* (BM); *ibid.*, 6.1960, *Losa España & Rivas Goday* (MAF); Escúllar, 29.6.1981, *Segura Zubizarreta 20902* (MA); Sorbas, 15.5.1928, *Lacaita 160/28* (BM); Huércal-Overa, 14.4.1971, *O. de Bolòs* (BC); *ibid.*, 15.5.1928, *Lacaita 154/28* (BM); Schlucht bei Huercal Overa, 2.4.1953, *Merxmüller & Wiedmann 292/53* (M); Cievas, coteaux, 13.4.1931, *Sennen* (BM); Puente del rio Almanzora - Huercal-Overa, 17.5.1957, *Rivas-Goday* (MAF); Mojácar, 50 m, 1.6.1974, *Segura Zubizarreta 8670* (M); Mündungsgebiet des Rio Almanzora bei Palomares und Villaricos E Vera, 20.4.1973,

*Merxmüller & Gleißner 29214* (M); inter oppida Pulpi & Vera, 8.12.1851, *J. Lange* (C); Pulpi, 5.12.1851, *J. Lange* (C). – PROV. MURCIA: 4 km SE Puerto Lumbreras, 420 m, 26.4.1965, *Greuter 6932* (LD, M, W, herb. Greuter); Puerto de Lumbreras, Cabezo de la Jara, 7.6.1882, *Rouy* (LY); Los Almendricos vers Puerto de Lumbreras, 4.5.1924, *Jerónimo 5136* (BC, BM, G, GH, LE); Lorca, 16.5.1886, *Rouy* (LY).

MOROCCO: 98 km NE of Agadir to Imi-n-Tanoute, 1050-1100 m, 9.5.1982, *Davis & King 68124* (E); 10 km environ après Imi-n-Tanoute, 31°17'N, 8°56'W, c. 1000 m, 23.5.1980, *Charpin & al. MAR81* (G); supra Tafrouit, 1500 m, 16.6.1939, *Maire & Wilczek* (MPU); Anti-Atlas, ultra castellum Tifemit, 1200 m, 16.4.1935, *Maire & Wilczek* (MPU); NW side of Djebel Lekst near pass Tizi-n-Tagounit, 1600-1700, 29°48'N, 9°08'W, 15.5.1993, *Vogt & Oberprieler RV 11816* (B); Tafraoute to Souk Tleta de Tasserirt, 1300-1400 m, 27.3.1969, *P. & J. Davis 48803* (BM, E); Souk el Araba de Tanalt (Ammeln), 9.4.1935, *Maire & Wilczek 330* (S); 16 km E of Tafraoute on road to Ait Baha, 1400 m, 15.5.1982, *Davis & King 68364* (E); prope Tanalt, 800-900 m, 9.5.1935, *Maire & Wilczek* (MPU); 16 km from Tafraoute to Titeki, 1500 m, 28.3.1969, *P. & J. Davis 48869* (BM, E); Igherm, 1700-1800 m, 19.4.1931, *Maire & Wilczek* (MPU); Paß zwischen Kemis d'Isafen und Irherm, 1500-1600 m, 3.5.1994, *Kilian 3544* (B, herb. Kilian); W. Amismiz y Tizi-hemiri, 5000-9000', 1888, *Thomson* (K); cerca de Tassa, Ouirgane, 1000 m, 16.5.1981, *Fernández Casas & al. 4650* (MA); between Youkak and Asni, 6.5.1961, *De Wilde & al. 2150* (L); zwischen Aoulouz und Tazenakht S des Djebel Siroua, 1600 m, 14.4.1967, *Merxmüller & Oberwinkler 22528* (M); Marrakech Plain, between Sour el Az and Demnat, 1500ft, 3.1958, *Whiting & Richmond 113* (K); Taddert, Marrakesh - Quarzazad road, 1600 m, 13.5.1937, *J. Chaworth Musters 188* (BM); Grand Atlas, Demnat, c. 900 m, 21.5.1921, *S. Murbeck* (LD); Haut Atlas, 18 km S von Ouirgane, 1100 m, 6.5.1994, *Kilian 3598* (B, herb. Kilian); 33 km SE Quarzazate, 1450 m, 30°46'N, 6°41'W, 17.4.1986, *Podlech 41021* (G); Tanerurt (Reraia), 1250 m, 6.6.1921, *Jahandiez* (MPU); Bou Igui, Midelt - Missouri, 1200 m, 22.6.1954, *Van Steenis 19421* (L); Ksar el Souk, cerca de Midelt, 1200 m, 19.7.1982, *Fernández Casas & al. 7092* (MA); Tizi n'Talremt, 1820-1900 m, 32°37'N, 4°32'W, 30.6.1989, *Oberprieler 3310* (herb. Oberprieler); Midelt, gorges de l'oued Bou Adel, 1300 m, 1.5.1925, *Jahandiez 133* (BM, E, G); Tizi-n-Talremt, 25.5.1919, *Nain* (MPU); zw. Midelt und Er-Rachida, Tunnel de Legionnaire, 1250 m, 32°11'N, 4°21'W, 15.4.1987, *Oberprieler & al. 2150* (herb. Oberprieler); c. 19 km N Rich, 1500 m, 32°29'N, 4°31'W, 29.4.1993, *Vogt 10346 & Oberprieler 4794* (B); Midelt - Er-Rachidia, 1250 m, 32°11'N, 4°21'W, 15.4.1987, *Podlech 42450* (G); entre Mibladene et Tazensout, gorge de l'Oued Moulouya, au NE de Midelt, 1200 m, 13.6.1971, *G. Bocquet 10723* (BM); Todra-Schlucht, 12-14 km N Tinerhir, 1350-1380 m, 31°37'N, 5°35'W, 17.4.1987, *Podlech 42651* (G); Vallée du Dadés, Tinerhir, 29.3.1989, *Poelt* (GZU); Col du Ziz, 1100 m, 4.5.1976, *J. Lewalle 8380* (BM, BR); 21 km NE Missouri, 33°11'N, 3°53'W, 830 m, 14.4.1987, *Podlech 42339* (G); 21 km NE Missouri an der Straße nach Guercif, 830 m, 33°11'N, 3°53'E, 14.4.1987, *Lippert 21904* (M); Boudenib, 1000 m, 30.4.1973, *J. Lewalle 7036* (BR); 12 km E Tinerhir an der Straße nach Goulima, 1250 m, 31°29'N, 5°26'E, 17.4.1987, *Lippert 22172* (M); Monts du Debdou, Djebel Flouch c. 10 km N Debdou, 1100 m, 34°N, 3°06'W, 10.5.1993, *Vogt 11681 & Oberprieler* (B); Taourirt, 350 m, 10.5.1989, *J. Lewalle 12553* (B); env. de Berkane, massif des Beni Snassen, Djebel Tamed, 700-1000 m, 2.4.1928, *Wilczek & al. 1174* (A, G, L); env. de Berkane, massif de Beni Snassen, gorges en allant du Camp de Tafouralt, 700-800 m, 23.4.1928, *Wilczek & al. 1334* (G); 21,2 km E Bouarfa, 1130 m, 32°32'N, 1°50'W, 1.5.1993, *Vogt 10508 & Oberprieler* (B); 23 km W Figuig, 1100-1300 m, 32°08', 1°24'W, 1.5.1993, *Vogt 10567 & Oberprieler* (B); in montis Melias prope Figuig, 1000 m, 17.4.1932, *Maire* (BC); *ibid.*, 15.4.1932, *Maire* (MPU); Figuig, 2./3.1936, *A. W. Trethewey 208* (K); Djebel-el-Maiz, Teniet-el-Aoudja, 28./31.5.1918, *Maire* (MPU); Ida Ouchemlal et Ardar My-

onn, 1876, *Mardochée* (G); Grand Atlas, Imin Tala, c. 1350 m, 6.5.1921, *Frodin* (LD); Greater Atlas, Meraia(?), 5-6000ft, 5.1871, *Hooker f.* (K); env. de Deboon[?], rochers en montant de Ouenane à Flonch[?], 700-900 m, 10.4.1928, *Wilczek & al.* 475 (G); in convalle fl. Ait Messane pr. pag. Anferkon[?], c. 1300 m, 5.6.1926, *H. Lindberg* 3628 (S); in montis Xauen dictis (Bocoia), 150 m, 5.5.1929, *Font Quer* 472 (BC, BM, G, MAF, S, Z); Tarzougert, 18.4.1933, *Maire & Wilczek* 466 (L); Montes de Quebdana, 5.7.1930, *Sennen & Mauricio* 7627 (BC, BM, G, W); Djebel Habibi, 1911/12, *Gandoger* (W); South, N of City, 4.5.1871, *J.D. Hooker* (G, K); Sahara Occ., Djebel Bieka[?], Mouzeb el Aatchoue, 17.4.1952, *Guinet* (MPU).

ALGERIA: Ras Chergui sur Ain Sefra, c. 1500 m, 16.5.1901, *Hochreutiner* 206 (G, Z); Mers el Kebir, 11.4.1904, *R. Maire* 130 (LY); *ibid.*, 4.1849, *Boissier & Reuter* (G); *ibid.*, 23.4.1905, *Faure* (G); *ibid.*, Djebel Santou, 22.4.1890, *Clary* (COI, LY, Z); Djebel Santou, 2.2.1868, *A. Warion* (GH); Oran, *Pomel* (JE); *ibid.*, 31.3.1936, *A. Uggla* (S); *ibid.*, 3.3.1936, *G. Samuelsson* 6240 (S); *ibid.*, 3.1873, *E.C. Grad[?]* (E); *ibid.*, 1844, *Mumby* (GH); *ibid.*, 100 m, 26.4.1971, *Davis* 51618 (BM, E); *ibid.*, 30.3.1936, *O. Paulsen* (C); *ibid.*, 4.1886, *Battandier & Trabut* 176 (G, JE, L, LD, UPS); *ibid.*, 1849, *Boissier & Reuter* (C, G, LE, UPS, W); *ibid.*, 1919, *A. Clavé* 2462a (G); *ibid.*, fort Saint Grégoire, 8.5.1929, *R. Le Cesve* 5921 (BC, BM, BR, MA, Z); *ibid.*, Djebel Murdjadjo, 150 m, 30.3.1910, *W. Schibler* (Z); *ibid.*, 2.6.1974, *M. Thulin* 2373 (UPS); *ibid.*, colline de St. Cruz, 9.4.1906, *Romieux* 845 (G); *ibid.*, *Bolland* (W); *ibid.*, 26.4.1926, *Wilczek* 1621 (Z); Sidi Aissa, 4.5.1882, *A. Roux* (MPU); Djebel Aissa, 1200-1500 m, 5.1913, *W. Rothschild & Hartert* (BM); Mécheria, Dj. Antar, 7.4.1893, *Doumergue* (LY); Dj. Bequira au Chegga (Bedeau), 14.5.1894, *Doumergue* (LY); Dj. Sidi-el-Aâbele, 14.5.1894, *Doumergue* (LY); Bedeau, 22.7.1893, *Doumergue* (LY); prope Mascar ad flumen Elhammah, *Desfontaines* (G [ex herb. Lemonnier]); El Beida, au sud de Saïda, 1845, *Guyon* 11 (M); Djebel Sidi Akba, Djebel Amour, 9.6.1880, *A. Roux* (JE, MPU); Tadmite, 25.4.1968, *Rodin & al.* 680 (LE); Gada d'Enfour près Aflou, 29.5.1888, *Clary* 308 (MPU); Rocher de Sel, c. 25 km NW Djelfa, c. 1000 m, 2.5.1971, *J. Schneller* 60 (Z); Rocher des Pigeons, zwischen Sidi Makhlof und Laghouat, c. 900 m, 3.5.1971, *J. Schneller* 81 (Z); Bou Saada, *Battandier* (MPU); Ksar Chellala (Reibell) Djebel Ahmar Kradou, 19.4.1968, *Rodin & al.* 515 (LE); Boghar de Blochan, 6.1856, *Debeaux* (MPU); Hodna, *Dukerley* (MPU); Monts du Zab, 5 km W B'Chaiba, Paßhöhe, 600 m, 34°51'N, 4°52'E, 13.4.1982, *Podlech* 37225 (G, M); El Kantara, 1847, *Guyon* (BR); *ibid.*, 30.4.1894, *Forestin[?]* (M); *ibid.*, 17.4.1904, *Sterneck* 197 (M); *ibid.*, 2.1880, *J. Ball* (GH); *ibid.*, 23.4.1901, *Kuegler* (JE); *ibid.*, 24.4.1892, *Neyraut* 763 (MPU); *ibid.*, 24.4.1892, *Rouy* (LY); *ibid.*, 1.5.1906, *Romieux* 844 (G); Djebel Senia près Biskra, 22.4.1904, *Romieux* 281 (G); Biskra, 4.1914, *O. Renner* (M); between Biskra and Oued Sadouri (68 miles from Bousaada), 380 m, 13.4.1937, *Alston & Simpson* 169 (BM); Rhoufi to Biskra, 600 m, 15.5.1971, *Davis* 52375 (BM,E); Aurez, Rhoufi, 5.1936, *Clastrier* (MPU); Prov. de Constantine, Hadua, *Sollier* 1865 (BR); Foug el Gherza, 14.1.1965, *Botschantzev* 44 (LE); El Outaza[?], 6.1910, *Burgeff* (M); Djebel Zerga, 20.4.1968, *Rodin & Kalenov* 568 (LE); Djebel Rehouiz, 29.4.1968, *Rodin & al.* 767 (LE).

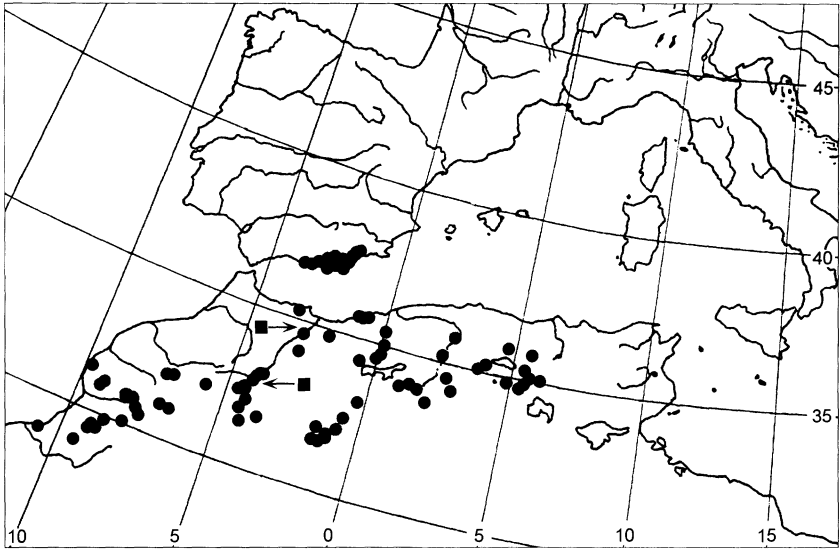


Fig. 55. Distribution of *Launaea viminea* (squares), and *Launaea lanifera* (circles).