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Taxonomic Study of the Genus *Launaea* L. from Pakistan

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Abstract: The genus *Launaea* L. belongs to the tribe Lactuceae in family Asteraceae/Compositae whose taxonomic study has been carried out from Pakistan. The genus *Launaea* belongs to the tribe Lactuceae of Asteraceae. In this genus eight species were considered for morphological study i.e. *Launaea intybacea, L. aspelinifolia, L. capitata, L. procumbens, L. microcephala, L. spinosa, L. massauensis* and *L. residifolia*. Material for taxonomic studies was obtained from naturally occurring population and from herbarium of Quaid-i-Azam University (ISL). In *Launaea asplinifolia* the achenes are elliptical, ± 5-ribs are present on each face and neck absent. In *L. capitata* the leaves are mostly basal while *L. intybacea* leaves ½ amplexicaul, auriculate, auricles rounded with long fine points. *Launaea microcephala* differs from *Launaea procumbens* in being annual, sparsely pubescent to villous herb and in possessing terminal heads on the dichotomously branched flowering stem, involucral bracts many-seriate, and the achenes are of one type.

Key words: *Launaea*, Asteraceae, Lactuceae, morphology, taxonomy

Introduction

The Compositae is the largest family in temperate countries; that is, they include the most species. (In the tropics the orchids may dispute the title). Many Compositae are familiar in our gardens–dehlias, chrysanthemums, asters, zinnias, many others; several are known in the herb garden–costmary, tansy, fever few, southernwood, wormwood; others come to our tables–lettuce, endive, artichoke, salsify; sunflowers furnish food for livestock; pyrethrum yields an insecticide and others are among our least welcome weeds–dandelions, ragweed's, cockleburs, thistles and such plants as the bitterweeds which are poisonous to livestock. The weeds, indeed, in their worldwide presence and abundance, justify the elevation of the family to the summit of the plant kingdom.

The family Asteraceae (Compositae) has the distinction of an extremely natural taxon, with its unique floral theme and micro morphological features including those of pollen grains. It has attracted fascinated and even repelled botanists for over two centuries (Heywood, 1977). The Asteraceae is cosmopolitan in distribution, occurring in all continents except Antarctica, having an estimated number of about 13mn6717 genera and 21,000 species (Hickey and King, 1997) and in Pakistan it is represented by 142 genera and 620 species (Stewart, 1972).

Members of Asteraceae can easily be identified by their typical capitulate inflorescence, 5-lobed gamopetalous corolla, syngenecious stamens, inferior bicarpellary unilocular ovary with a single basal ovule. The fruit is an achene with a non-endospermic seed and the usual presence of pappus.

According to Razaq *et al.* (1998) Compositae (Asteraceae) is the largest and one of the most widely distributed families of flowering plants with 1000 genera and 20,000 species (Good, 1956; Stebbins, 1953). In the Flora of Pakistan, it is represented by 110 genera and c. 604 species (Ali, 1978); of these, only 10 species (i.e. 1.6 % of the total species) have been subjected to cytological studies by previous workers like Baquar and Askari (1970) and Khatoon and Ali (1982). Razaq *et al.* (1998) studied meiotic chromosome numbers of 32 species belonging to 32 genera of the family Compositae. Coincident with evolutionary advancement, decreases in chromosome size, number and symmetry were frequently encountered.

Launaea Cass. is the largest genus of tribe *Lactuceae* (Asteraceae) in the Cape Verde Islands, W. Africa of the five species, three are endemic to the archipelago. The non-endemic is *L. arborescens* (Batt.) Murb. (Syn.: *L. melanostigma* Petterson, ef. Brochman and Ahmad, 1987) and *L. intybacea* (Jacq.) Beauverd. The spiny xerophyte *L. arborescens* occurs in the eastern and southern islands, while *L. intybacea* has a wide ecology and distribution. The reports of *L. nudicaulis* (L.) Hook. f. From the Cape Verde Islands (cf. Hansen and Sunding, 1985) are due to confusion with *L. intybacea* (Kilian, in prep.). The most common of the endemic species is *L. picridioides* (Webb) Robinson, which is a mesophyte occurring in the northern islands; an additional northern endemic will be treated by Kilian (in prep.), the third endemic species, the only one in the southern group of islands, is described here.

The flowers are all of the "ray" type, none tubular; they are purple or yellow. The bracts are equal in length. The pappus is of feathery or "plumose" bristles- the bristles bearing hairs along their length; it stands at the summit of a slender beak and is very conspicuous- and beautiful- in fruit.

In the present investigation, the morphology of the species, all Pakistan, of the genus *Launaea* in tribe *Lactuceae*, has been studied systematically. The present study was undertaken to evaluate the morphological differences in the *Launaea* of family Asteraceae.

Materials and Methods

Plant specimen of various species from the Herbarium of Quaid-I-Azam University (ISL) and fresh material from the wild was used for morphological studies. Six to ten specimens per species were used for assessment of morphological characters, seven to ten values were noted for each character of a representative plant. This work has been done during 1999 to June, 2001.

Gross morphology of the taxa studied: The characters studied during this are, habit of the plant, height of the plant, stem branching, stem diameter, length X bredth (L X B of leaf), presence or absence of radical leaves, margin of the leaves, petiole of the leaf, series of involucral bracts, shape of outer most and inner most involucral bracts, shape of capitulum, diameter of capitulum, flower colour, shape of achene, length of achene and presence or absence of pappus.

Results

***Launaea* L.:** Cassini, Dict. Sci. Nat. 25: 321(1822); Bentham and Hooker, Gen. Pl. 2: 529(1873); Hooker fil. Fl. Brit. Ind. 3:414(1881); Kashyap and Joshi, Lah. Distr. Fl. 155(1936); S. M. H. Jafri, Fl. Kar. 347(1966); Grierson in Dassanayake and Fosberg, Rev. Handb. Fl. Cey. 1: 275(1980).

Annual, biennial or perennial, glabrous herbs. Stems erect or prostrate, branched from the base. Leaves sessile, alternate, chiefly radical, sinuate-lobed, pinnatifid, with spinulose, cartilaginous teeth. Heads terminal or lateral, peduncled or sessile-subsessile, racemose or paniculate, sometimes in axillary groups. Involucre campanulate; bracts 3-4 (-many) seriate, imbricate, membranous, outer short, inner linear-lanceolate, midrib thickened in fruiting and with scarious margin. Flowers yellow, ligulate 5-toothed. Achenes truncate or tapering and rostrate at the apex, narrow, 4-5 angled, rarely winged; pappus simple, slender, white, fused at the base into a deciduous ring. This genus is represented

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by 18 species in Pakistan and only 3 occur in the North Areas.

Key based on morphological characters of *Launaea:*

1a. Radical leaves sinuate-dentate, cauline not amplauxicaul, achenes truncate at both ends, not beaked, prominantly ribbed.....2
2a. Annual sparsely pubescent to villous, heads terminal on the dichotomously branched flowering stems.....3
2b Biennial or perennial glabrous herb; heads solitary or clustered, more or less racemose on the flowering stems.....4
1b. Radical leaves more or less irregularly and finaly subspinulose, dentate, cauline ½ amplexicaul, achenes beaked, obscurely 4-5 ribbed.....*L. intybacea*
3a. perennial, stem branched, leaves runinate pinnatifid, achene elliplical.....*L. aspelinifolia*
3b. Annual, scapose stem, leaves spathulate, oblong, achene truncate.... *L. capitata*
4a. Annual, scopose stem----------5
4b. Perennial, much branched stem----------7
5a. Involucral bracts 2-serriate, achenes of one type...6.
5b. Involucral bracts many serriate, achenes dimorphic, outer compressed, inner 4-angled.....*L. procumbens*
6a. Annual, sparsely pubescent, leaves both radical and cauline, dichotomously branched, achene 3 mm long, pappus 2 mm long.....*L. microcephala*
6b. Perennial, repeatedly spinate, leaves mostly radical, branches intricate, achene 4.5 mm long, pappus 5 mm long..... *L. spinosa*
7a. Pappus dimorphic outer are persistent while inner deciduous..... *L. massauensis*
7b. Pappus dimorphic both are persistent.... *L. residifolia*

Plate 1: *L. aspleniifolia*

Launaea aspleniifolia (DC.) Hk. f., FBI 3: 415. 1881. (Plate 1).

Syn. *Microrhynchus aspleniifolius* DC.; Clarke Comp. Ind. 276.
Annual or perennial, 35-cm length, erect herb. Stem branched from the base, thin, smooth, ribbed. Leaves sessile, radical leaves 7 X 1.2 cm², runcinate, pinnatifid, ± 10 lateral lobes, spinulose on margins, obtuse, glabrous, auriculed. Middle leaves 3 X 1 cm², runcinate, pinnatifid, ± 8 lobes, spines are present on lobe margins, obtuse, glabrous, uppermost leaves 0.2 X 0.1 cm², simple, cordate, acute, entire, glabrous. Head companulate, peduncled, 0.2 cm², head size 1.2 X 0.3 cm², axillary and terminal, bracts 2- serriate, outer bracts 0.3 X 0.1 cm², cordate, glabrous, entire, acute, inner bracts 0.4 X 0.1 cm², elliptic, glabrous, entire, acute. Flowers ligulate, achene 0.4 X 0.1 cm², elliptical, ± 5 ribs on each face, pappus 0.7 cm long, whitish slender, persistant, neck absent. 2n = 12.

Specimen examined: NWFP: Tochi, Bannu, Hafizullah and Dilawar, 454, 50536, 15-04-1977 (ISL); Punjab: Salgran, Rawalpindi, Manzoor Hussain and Wali-ur-Rehman, 27, 87521, 27-05-1978

Plate 2: *Lunaea procumbens*

Plate 3: *Launaea residifolia*

(ISL); Bhimber, Campbellpur, Shahzad and Arif,1098, 47651, 14-04-1977 (ISL);Bahawal Nagar, Mir Ajab Khan and Manzoor Hussain,

488, 45466, 09-03-1977 (ISL).

Launaea capitata: (Spreng.) Dandy in Andrews, Flowers. Pl. Sudan 3: 40(1956). Plate Comp. 120,a.

Syn.: *Sonchus capitatus* Spreng. (1826); *Microrhynchus glomerata* Jaub. and Spach (1848); *Zollikoferia glomerata* Boiss. (1875); *Launaea glomerata* Hook.f. (1881).
Annual or short lived perennial herb, short-stemmed or with spreading or ascendant, naked scapose stems, sometimes with a prominent leaf on the lower node. Leaves mostly basal, up to c. 16 cm long, spathulate-oblong, shallowly to deeply irregularly dentate to pinnately lobed, runcinate; the margin all along with minute cartilaginous denticulations. Capitula sessile or shortly peduncled in axillary and or terminal clusters on short to up to 40 cm long scapes. Capitula subspherical, nodding at fruiting. Involucral bracts with wide scarious margins; inner involucral bracts up to 10 (-12) mm long. Ligules yellow. Achenes up to c. 4 (4.5) X 1.5-2 mm^2, truncate, spongy, compressed, ribbed, most with lateral ribs developing as prominent wings. Pappus up to 6 (-7) mm long, homomorphic with all setaceous rays deciduous with the orange pappus disc. 2n = 18

Specimen examined: NWFP: Ahmad Khel, N. Waziristan, Hafizullah and Ayaz, 147, 57125, 18-06-1977 (ISL); Danin, Chitral, Muqarrab Shah and Dilawar, 709, 53129, 02-06-1977 (ISL). Azad Kashmir: Saneha, Kotli, Shahzad and Nisar, 1230, 52979, 29-04-1977 (ISL); Sarsola, Mirpur, Shahzad and Nisar, 1076, 49934, 28-04-1977 (ISL); Kot Jamal, Mirpur, Shahzad and Arif, 1140, 47668, 15-04-1977 (ISL); Panjeera, Kotli, Shahzad and Nisar, 1660, 54594, 02-06-1977 (ISL); Guni, Kotli, Shahzad and Nisar, 1489, 54553, 31-05-1977 (ISL); Sancha, Kotli, Shahzad and Nisar, 1230, 52978, 29-04-1977 (ISL); Punjab: Multan, Mir Ajab Khan and Manzoor Hussain, 569, 45088, 12-03-1977 (ISL); Rajan Pur, Dera Ghazi Khan, A. Saboor and Nisar Ahmad, 534, 47629, 13-04-1977 (ISL); Jhudo, Mirpur Khas, A. Saboor and Nisar 110, 45404, 28-02-1977 (ISL).

Launaea intybacea: (Jacq.) Beauv. Bull. Soc. Bot. Geneve Ser. 2, 2: 114(1910); Dassanayake and Fosberg, Rev. Handb. Fl. Cey. 1: 277(1980).

Syn.: *Lactuca intybacea* Jacq., Ic. Pl. Rar. 1. 16, t. 12(1784); *Lactuca heyneana* DC., Prodr. 7:140(1838); Hooker fil., Fl. Brit. Ind. 3:403(1881); *Launaea heyneana* (DC.) Grierson in ed., R. R. Stewart, op. Cit. 762(1972).
Erect annual herb. Stems terete, glabrous, ca. 1.5 m tall branched. Radical leaves runcinate-pinnatifid, 15-(-30) X 5-(-10) cm^2 with 3-5 pairs of triangular lateral lobes upto 2 (-6) cm long, terminal segment, ± hastate, upto 6 cm long, acute or acuminate, margins± irregularly and finely subspinulose dentate teeth whitish, glabrous, glaucous on both sides; upper leaves similar narrower, ½ amplexicaul, auriculate, auricles rounded with long fine points. Capitula numerous, in distant cluster of 1-3, on long leafless upper branches: involucre ca. 10 X 3 mm^2 at the base; bracts 3-4 seriate, outer ovate 2-3 mm long, inner 10 mm long, lanceolate, glabrous. Flowers yellow. Achenes blackish, 3 mm long, elliptic and some what compressed, obscurely 4-5 ribbed minutely papillate, narrowed and shortly beaked at the apex; pappus 6 mm consisting of two thickness of hairs, white. Fl. and fr. 8-3.

Type: Cultivated at Vienna, seed from C. America (Type in W).

Note: I could not see the specimens from the Herbarium (ISL.) therefore, the description has been written from Dassanayake and Fosberg, Rev. Handb. Fl. Cey. 1:277(1980).

Launaea massauensis: (Fresen.) Sch.-Bip. ex Kuntze, Rev. Gen. Pl. 1: 351 (1891). Plate Comp. 118, c.

Syn.: *Heterochaena massauensis* Fresen. (1839); in Mus. Senck. 3: 74; Zollikoferia massauensis (Fresen.) Boiss. (1875); *Lactuca massauensis* (Fresen.) Sch. Bip. ex A. Rich. (1848); *Sonchus massauensis* (Fresen.) Sch.-Bip. (1867); *Brachyrhamphus lactucoides* T. Anderson (1860); *Launaea lactucoides* (T. Anderson) E. H. Krause (1905); *Launaea kuriensis* Vierh. (1906).
Rather slender annuals up to c. 30(-60) cm tall. Leaves often in a basal rosette only when stem scapose; also cauline on the lower nodes in robust specimens. Flowering stems several from the base, much branched, the branches divaricate capillary in the upper region, each capillary branch bearing a capitulum. Leaves thin, the lower spathulate, runcinate to irregularly pinnately lobed, the margin minutely denticulate; when present, cauline leaves much smaller, semi-amplexicaul, auriculate, the auricles rounded; acute or obtuse. Heads c. 5 X 1.5 mm^2 at flowering (excluding the ligules), up to 7 X 2.25 mm^2 at fruiting. Ligule upto 14 per head, pale yellow to yellow, up to c. 5 mm long above the involucre. Fruiting inner involucral bracts 5, up to c. 8 mm long, thin with prominent scarious margins. Achenes dimorphic, outer black to blackish, muricate, compressed, prismatic, subrostrate to shortly beaked; the inner gradually becoming columnar, ivory-white, not muricate; up to c. 3 mm long: pappus c. 5 mm long, persistent, dimorphic with both cottony and setaceous rays; pappus of innermost achenes deciduous.

General distribution: Eastern Africa, Western, Southern and SE Arabia, Iran.

Launaea microcephala: Hook, fil. Fl. Brit. Ind. 3: 415. (1881); R. R. Stewart, Op. Cit. 762 (1972).
Annual, sparsely pubescent to villous, small slender herb. Leaves both radical and cauline, radical leaves 12-24 mm, petioled, obovate-spathulate, pubescent, cauline sessile, oblong, present at the lower forks of the flowering stem, dichotomously branched, 5-18 cm, pubescent below. Heads 6 mm long, cylinderical, terminal on the dichotomously branched flowering stem, and peduncled. Involucral bracts 2-seriate, 6-8 in number, outer minute, inner linear, midrib thickened in fruit. Achenes 3 mm long, slender, linear, truncate at both ends, striate, dark brown when ripe, outer slightly curved; pappus 2 mm long, very soft, white, persistent.

Type: Northern Areas: Skardu, C. B. Clarke s. n. (Type in BM).

Note: I could not find any specimen of this species in the herbarium (ISL), therefore, the description has been written from HOOKER fil. (1881).

Lunaea procumbens: (Roxb.) Ramayya and Rajagopal, Kew Bull. 23 (3): 463. 1969; R. R. Stewart, op. Cit. 762 (1972).

Syn: *Launaea fallax* (J. and S.) O. Ktze. Rev. Gen. 350. 1891. Microrhynchus fallax (J. and S., 111. Pl. Or. 3: 106. 1847-50; Prenanthes procumbens Roxb. Fl. Ind. 3: 404. 1832; Paramicrorhynchus procumbens (Roxb.) Kirp., Fl. U.R.S.S. 29: 237. 1964; Launaea procumbens (Roxb.) Amin in Tackholm, Students Flora Egypt 84. 1956; *Launaea nudicaulis* Hk. f. (non Less.) FBI 3: 416(1881).
Biennial or perennial, glabrous, 42 cm tall herb. Stem branched from the base, thin, smooth, ribbed, decumbent. Leaves sessile mostly confined to the base. Radical leaves 6-9X2-3 cm^2, spathulate, pinnatifid with 6-12, rounded, obtuse, lateral lobes with numerous white cartilaginous teeth smooth. Cauline 1-2 cm long, oblong-spathulate, entire, and dentate. Heads 12-15 X 3-4 mm^2, solitary or clustered, racemose, narrow cylinderical. Involucral bracts many-seriate, outer cordate with thick central rib and white membranous margin, inner ca. 8 in number, 12 mm long, lanceolate, smooth membranous. Achenes dimorphic, outer much compressed, 3.5 mm long, many-ribbed, narrow above, black with upwardly pointed minute teeth, inner 4-sided with narrow upper portion and broad truncate below, yellowish white, smooth; pappus 6-8 mm long, white, deciduous. Fl. and fr. 8-9.

Alt. Ca. 1300 m. Soil. Loamy-sandy. Common in hot and dry areas, Described from W. Himalayas (Type in K.). 2n = 36, n = 9.

Specimen examined: NWFP: Tanaza Dam, Shahzad and Maqsood, 115, 81648, 30-03-1978 (ISL); Jungle Mangle, Hazara, Muqarrab Shah and Dilawar, 267, 37042, 10-10-1976 (ISL). Azad Kashmir: Sarsola, Mirpur, Shahzad and Nisar, 1076, 49937, 28-04-1977 (ISL); Pirgali, Mirpur, Shahzad and Nisar, 1302, 50606, 01-05-1977 (ISL); Mirpur, Shahzad and Arif, 805, 48561, 10-04-1977 (ISL); Muzaffarabad, Mir Ajab Khan and Manzoor Hussain, 674, 45505, 15-03-1977 (ISL); Dallai to Race, Muzaffarabad, Azad Kashmir, Shahzad Iqbal and Wali-ur-Rehman, 474, 95927, 27-04-1978 (ISL); Sohansa, Kotli, Shahzad and Nisar, 1865, 57025, 05-06-1977 (ISL); Punjab: Achra, Lahore, Muqarrab Shah and Ayaz Abbasi, 160, 50482, 27-02-1977 (ISL); Pind Dadan Khan, Jhelum, M. A. Siddaqi, Akram and Lal Khan, 27, 38670, 24-09-1976 (ISL); Dina, Jhelum, A. Saboor, Manzoor, Maqsood, Arif and Akram, 88, 78348, 21-03-1978 (ISL); Rashid Abad, Jang, Mir Ajab Khan and Ayaz, 260, 84909, 10-04-1978 (ISL); Chinyot, Jhang, Mir Ajab Khan and Ashraf, 745, 51664, 08-04-1977 (ISL); Dina, Jhelum, A. Saboor, Manzoor, Maqsood, Arif and Akram, 85, 78344, 21-03-1978 (ISL); Sutlag Bridge, Buhawalpur, Mir Ajab Khan and Manzoor Hussain, 21, 45376, 24-02-1977 (ISL); Chakwal, Rawalpindi, M. N. Chaudhri and Siddiqi, 205, 14544, 26-04-1975 (ISL); Shah-Saddr-u-din, Dera Ghazi Khan, A. Saboor and Nisar Ahmad, 431, 52726, 09-04-1977 (ISL); Hassan Abad, Bahawal Nagar, Mir Ajab Khan and Manzoor, 420, 45080, 07-03-1977 (ISL); Mirchan abad, Bahawal Nagar, Mir Ajab Khan and Manzoor, 462, 45085, 09-03-1977 (ISL); Chishtian, Bahawalnagar, Mir Ajab Khan and Manzoor, 523, 51649, 10-03-1977 (ISL); Dhutal Nallah, Shahzad and Maqsood, 466, 81127, 06-04-1978 (ISL); Burhan, Attock, Shahzad and Nisar, 2120, 81059, 14-03-1978 (ISL); Lawrencepur, Attock, Shahzad and Nisar, 2201, 79823, 15-03-1978 (ISL); Burhan, Campbellpur, Mir Ajab Khan, Ashraf, Arif, Ayaz and Maqsood, 79, 47551, 21-03-1977 (ISL); Qutbal, Attock, Shahzad and Maqsood, 8, 81099, 28-03-1978 (ISL); Jand, Attock, Shahzad Iqbal and Maqsood, 611, 90905, 08-04-1978 (ISL); Dhulian, Attock, Shahzad Iqbal and Nisar Abbasi, 2687, 93511, 24-03-1978 (ISL); Thatta, Attock, Shahzad Iqbal and Maqsood, 495, 98542, 07-04-1978 (ISL); Kanur Isakel, Mianwali, Mir Ajab Khan and Maqsood Ahmad, 266, 87449, 11-03-1978 (ISL); Mundi Town, Mianwali, Mir Ajab Khan and Ayaz, 736, 84430, 26-03-1978 (ISL); Pipal Garden, Mianwali, Mir Ajab Khan and Ayaz, 443, 81630, 20-03-1978 (ISL); Shabaz Khel, Mianwali, Mir Ajab Khan and Maqsood, 70, 81043, 08-03-1978 (ISL); Vihari, Multan, Mir Ajab Khan and Manzoor Hussain, 633, 45499, 14-03-1977 (ISL); Sind: Khanpur, Rahim Yar Khan, Mir Ajab Khan and Manzoor, 238, 45067, 07-03-1977 (ISL); Railway Station Dadu, A. Saboor and Nisar, 336, 45470, 10-07-1977 (ISL); General distribution: Plains of Pakistan and India; S. W. Asia, N. Africa.

Launaea residifolia: (L.) O. Ktze. Rev., Gen. Pl. 351. 1891. (Plate 111).

Syn.: *Scorzonera resedifolia* L. Sp. Pl. 1198. 1753; *Launaea chondrilloides* (DC.) Hk. f., FBI 3: 415; *Launaea mucronata* (Forssk.) Amin, non-sensu Muschler.

Perennial, stoloniferous herb, up to c. 40 cm tall, usually much smaller. Flowering stems much branched. Leaves mostly rosulate, some cauline, much variable in size, lower usually deeply irregularly pinnately lobed, the lobes denticulate to pinnatifid with white-callous tips, acute. Upper leaves only at a few lowers nodes, more or less amplexicaul, much smaller but similar to basal leaves. Ultimate inflorescence branches with a few spaced minute bracts below each flower heads. Upper involucral scales up to c. 12 (-15) mm long. Flowers 30-60 per capitulum. Capitulum receptacle c. 3-4 mm across at fruiting when the involucral scales thickens at base and spread out. Outer achenes papillose-pubescent, c. 4(-6) mm long, columnar-prismatic, with 5 main ribs, the main ribs basely inflated to form 4 prominent horns. Pappus dimorphic, with both cottony and setaceous rays, rather persistent, up to c. 12 mm long. 2n = 16, 18.

Specimen examined: Baluchistan: Panjgur, Muqarrab Shah and Nisar Abbasi, 278, 108804, 21-04-1979 (ISL); Jewani, Makran, Muhammad Ashraf and Lal Hussain, 73, 44014, 07-03-1977 (ISL); Bank hurma, Mir pur, Shahzad and Arif, 854, 47613, 10-04-1977 (ISL); Punjab: Attock, Shahzad and Nisar, 2404, 81073, 18-03-1978 (ISL); Taman, Attock, Shahzad and Maqsood, 405, 81122, 01-04-1978 (ISL); Thatta, Atock, Shahzad Iqbal and Maqsood, 497, 98338, 07-04-1978 (ISL); Sind: Dera Nawab Shah, Mir Ajab Khan and Manzoor Hussain, 229, 45408, 28-02-1977 (ISL).

Launaea spinosa: (Forssk.) Sch.-Bip. Ex Kuntze, Rev. Gen. Pl. 1: 350 (1891). Plate Comp. 118, b. (Forssk.) Sch. Bip. In Webb and Berth. Phyt., Canar. 2: 428. 1836-50.

Syn.: *Prenanthes spinosa* Forssk. (1775); *Sonchus spinosus* (Forssk.) DC. (1838); *Launaea acanthodes* sensu Collenette (1985) non (Boiss.) Kuntze (1891).

Perennial spiny repeatedly branched small shrub up to c. 50 cm tall. Branches spiny, naked, and intricate. Leaves mostly basal on young plants, or on new shoot from old branches, caduceus, linear, linear-lobed, the lobes glabrous, glaucous, sinuately lobed, linear-lanceolate to spathulate. Capitula borne at the tips of new branches which end up as spines, as well as singly or clustered axillary, laterally the spinous branches, short peduncled, up to c. 10 (-13)-flowered. Inner involucral bracts 5, up to c. 6(-7) mm long the corolla tube. Achenes c. 3.5 (-4.5) mm long, slightly constricted a little below the pappus, truncate, corky white, with 5 main ribs and 10 secondary ribs, outer sub-compressed, curved, muricate, the inner few columnar, muricate or smooth. Pappus c. 5 mm longs, setaceous, persistent. N = 7.

General distribution: Egypt, Southern Sinai, Jordan, and Saudi Arabia.

Discussion

The genus *Launaea* belongs to the tribe Lactuceae of Asteraceae. In this genus eight species were considered for morphological study i.e. *Launaea intybacea, L. aspelinifolia, L. capitata, L. procumbens, L. microcephala, L. spinosa, L. massauensis* and *L. residifolia*. Material for taxonomic studies was obtained from naturally occurring population and from herbarium of Quaid-I-Azam University (ISL). In this taxa different morphological characters were analyzed like, habit of the plant, height of the plant, stem branching, stem diameter, length X breadth (L X B of leaf), presence or absence of radical leaves, margin of the leaves, petiole of the leaf, series of involucral bracts, shape of outer most and inner most involucral bracts, shape of capitulum, diameter of capitulum, flower colour, shape of achene, length of achene, presence or absence of pappus.

In *Launaea asplinifolia* the achenes are elliptical, ± 5-ribs are present on each face and neck absent. In *L. capitata* the leaves are mostly basal while *L. intybacea* leaves ½ amplexicaul, auriculate, auricles rounded with long fine points. *Launaea microcephala* differs from *Launaea procumbens* in being annual, sparsely pubescent to villous herb and in possessing terminal heads on the dichotomously branched flowering stem, involucral bracts many-seriate, and the achenes are of one type. In *Launaea procumbens*, on the other hand, the herb is biennial or perennial and glabrous, heads are solitary or clustered, more or less racemose on the flowering stems, involucral bracts are many-seriate, and the achenes are dimorphic, outer compressed and the inner 4-angled. So it is concluded that in the study of the plant taxonomy not only the morphology but the latest techniques also play a key role in identification and classification. But in this research project a large amount of data is recorded in morphology and palynology for the first time in Pakistan which is a contribution towards the

publication of the family Asteraceae/Compositae with a finding of reporting a new specie of *Sonchus palustris* from Pakistan as well as recording the diagnostic characters of the genera in tribe *Lactuceae*.

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