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THE GENUS *CICERBITA* WALLR. (CICHORIEAE-ASTERACEAE) IN PAKISTAN AND KASHMIR

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Abstract

The genus *Cicerbita* Wallr. of the tribe Cichorieae-Asteraceae is revised for Pakistan and Kashmir. A broader generic concept of the genus is accepted and in all 11 species have been recognized including 3 new species viz. *Cicerbita astorensis,* Roohi Bano & Qaiser, *C. alii,* Roohi Bano & Qaiser and *C. gilgitensis* Roohi Bano & Qaiser. 5 new combinations, including 3 at species and 2 at varietal level have also been proposed. An artificial key to all the species is provided. Latin diagnosis, illustrations of newly described species, world wide and local distribution and ecological notes of all the species are also furnished.

Introduction

The genus *Cicerbita* Wallr., Cichorieae-Asteraceae was established by Wallroth as early as in 1822 based on *Lactuca alpina*. He characterized the genus having unbeaked or shortly beaked cypselas and an outer most ring of short pappus. Different workers treated the genus differently. Some have accepted it in broader sense and the other treated in a narrow sense. Bremer (1994) and Mabberley (1997) adopted its narrow generic concept and recognized only 18 species under it. Similarly, Lack (2007) also accepted the genus in a narrow sense and reported only 5 species. While Kilian *et al.* (2009) broadened the generic circumscription on the basis of morphological and molecular evidences and reduced the genera *Cephalorrhynchus* Boiss., *Mycelis* Cass., *Melanoseris* Decne., *Chaetoseris* C. Shih and *Zollikoferiastrum* (Kirp.) Kamelin under its synonymy. Accepting the treatment of Kilian *et al.* (2009) the present authors also took the broader concept of the genus *Cicerbita* Wallr., and recognized 11 species in Pakistan and Kashmir including 3 new species. The taxonomic treatment of the genus for our region was carried out by various workers such as Bentham & Hooker (1873), Rechinger (1977) and Mamgain & Rao (1994). None of the treatment covers entire area under consideration. Therefore in the absence of a comprehensive treatment of the genus *Cicerbita* Wallr., from Pakistan and Kashmir, it seemed desirable to conduct a detailed taxonomic revision of the entire genus *Cicerbita* Wallr.

In Pakistan, the genus is mostly confined to the northern areas in the districts of Chitral, Gilgit, Astor, Swat, Kurram Valley and Kashmir.

Materials and Methods

The taxonomic revision of the *Cicerbita* Wallr., is based on the study of more than 100 specimens belonging to the following herbaria viz., BM, E, K, KUH, M and RAW (abbreviated according to Holmgren *et al.*, 1990).In addition to this, living material has also been studied. Most of the names whether accepted or synonyms have been typified with the help of original description and herbarium specimens.

The distribution of all the species on world wide basis has been traced with the help of specimens and literature.

Cicerbita Wallr.

Wallr., Sched. Crit. 433. 1822; Benth., in Benth. & Hook. f., Gen. Pl. 2: 525.1873 p.p., emend; Beauv.,in Bull. Soc. Bot. Gen. (2) 2: 115.1910. p.min.p; Lack, in Kadereit & Jeffrey (Eds.), Fam. Gen. Vasc. Pl. 8:188. 2007; Kilian *et al.*, in Funk *et al.* (Eds.), Sys. Evol. Biogeog. Comp. Cichorieae, 344-383.2009.

Cephalorrhynchus Boiss. Diagn. Pl. Or. Nov. ser. (1) 4:28. 1844.

Annual-perennial herb. Plant acaulescent- caulescent. Leaves entire- pinnatifid, sharply denticulate -serrulate, runcinate pinnatifid- dissected or simple lobed. Synflorescence racemose-paniculate. Capitula subcylindric - campanulate, drooping, 5-32 florets per capitulum, peduncle flattened. Ligules blue, lilac, violet, purple or rarely yellow. Involucre phyllaries mostly 3-seriate, villous or hirsute - long papillose dorsally, obtuse with beard of fine hairs at the apex. Receptacle naked. Cypsela brown-black (red when immature), elliptic-linear-oblong, muricate or scabrid-hispidulous, attenuate apically in to a distinctly stout- slender beak, pappus biseriate, outer short, forming somewhat crown, inner long, bristly.

A genus of c.35 species, represented in study area by 11 species.

Key to the species

1 + Plant acaulescent ..... **1. *C. astorensis***
- Plant caulescent 2
2 + Phyllaries 2-seriate 3
- Phyllaries 3-4 seriate 6
3 + Basal leaves rosulate. Cauline leaves either absent or reduced to scales 4
- Basal leaves usually absent, if present than cauline leaves well developed 5
4 + Synflorescence corymbose. Involucre phyllaries 6-8 ..... **8. *C. benthamii***
- Synflorescence not arranged in corymbs. Capitula single terminal. Involucre phyllaries 11-13 ..... **9. *C. polyclada***
5 + Capitulum with 5 florets. Cypsela brown, up to 12 mm long including beak; beak concolorous up to 3 mm long ..... **6. *C. rapunculoides***
- Capitulum with 6-8 florets. Cypsela blackish-brown, up to 10 mm long including beak; beak discolorous (white) mostly at the apex, up to 2 mm long ..... **7. *C. decipiens***
6 + Capitula with 6-8 florets ..... **7. *C. decipiens***
- Capitula with (10-) 15-30 florets 7
7 + Stem broad, up to 10 mm; leaves 10-18 x 3-5 cm, unlobed, sharply denticulate-serrulate; pappus 12 mm long ..... **2. *C. alii***
- Stem narrower, 3-5 mm broad; leaves 7-10 x 0.5-1.5 (-2) cm, entire or pinnatifidly lobed; pappus 4-9 mm long 8
8 + Capitulum with more than 30 florets. Cypsela black, oblanceolate; beak stout and concolorous; pappus 8-9 mm long ..... **3. *C. gilgitensis***
- Capitulum with 13-25 florets. Cypsela brown-blackish, elliptic-linear; beak slender and discolorous; pappus 4-7 mm long 9
9 + Synflorescence fasciculate-paniculate. Capitulum drooping and dorsally long papillose or glandular hairy, 1.5-2 x 1-1.5 cm. peduncle flattened 10
- Synflorscence laxly racemose. Capitula infundibuliform, erect and glabrous, 0.5-1 x 0.4-0.5 cm, peduncle cylindrical 11

10 + Florets 13-15 per capitulum. Involucre phyllaries 15. Cypsela black with white beak; pappus snowy white ..... **4. *C. macrorhiza***

\- Florets 25-30 per capitulum. Involucre phyllaries 20-22. Cypsela brown with cream or yellowish beak; pappus dirty white ..... **5. *C. lessertiana***

11 + Involucre phyllaries 20-25, 6-10 mm long; cypsela 5.5-7 mm long, red when young afterwards blackened, cuneate-linear, beak white, up to 3 mm long; pappus 3-4 mm long ..... **10. *C. picridiformis***

\- Involucre phyllaries 9-15, 11-14 mm long; cypsela 4.5-5 mm long, black, fusiform, beak concolorous or pale, up to 2 mm long; pappus 5-6 mm long ..... **11. *C. chitralensis***

1. *Cicerbita astorensis* Roohi Bano & Qaiser, sp.nov. (Fig. 1)

Holotypus: Pakistan: Astor Dist.: Shaban top above Dombabho, 11.9.2006, *Ali Noor et al.* 584(KUH!)

Diagnosis: Species insignis, a speciebus nobis notis distinctissima habitu acaulescenti.

Plant small, acaulescent and scapigerous herb. Basal leaves rosulate, small, sessile-narrowed at the base, linear-oblanceolate, usually entire, acuminate, 1-3 x 1 cm, glabrous. Capitula solitary, terminal, campanulate, 1.5-2 x 0.5 cm, c.22 florets per capitulum, peduncle long, villous. Involucre phyllaries 3-seriate, outermost 5-7 x 2 mm, lanceolate, inner ones 9-11 x 1-1.5 mm, linear - oblong. Florets purplish. Cypsela 7 x 2 mm, brown, ellipsoid, gradually attenuate into 2 mm long, pale or cream beak; pappus biseriate, outer small, inner 6-7 mm long, dirty white.

Etymology: This species is named after the type locality (Astor- Gilgit)

Note: The new species *Cicerbita astorensis* Roohi Bano & Qaiser is quite similar to ***C. lessertiana*** (Wall. ex DC.) Mamgain & Rao in general appearance but can be distinguished from it by having stemless habit and solitary capitulum where as in *C. lessertiana* (Wall. ex DC.) Mamgain & Rao, the stem is well-developed and the capitula are in fasicles. The Pollen morphology of both the species is also different. In the new species the spines are 7.5 μm long and exine is 7.5 μm thick including echinae while in *Cicerbita lessertiana* (Wall. ex DC.) Mamgain & Rao, spines are 6.25 μm long and exine is up to 8.75 μm thick including echinae (Fig. 5).

Specimens examined: Gilgit Dist.: Rai-juth, Valley Khaltarow, Haramosh, Gilgit, 5.8.2001, *Sherwali Khan* 72 (KUH); Astor Dist.: Shaban top above Dombabho, erect perennial herb, 9 cm tall, florets blue, on open plain, not much common, c.3500 m, 11.9.2006, *Ali Noor et al.* 584 (KUH); Kashmir: Kolohai, Kashmir, florets lovely blue, Sep.1913, *Mrs.M.A. Evershed* s.n. (BM); Gulmarg, 2690 m, Sept., 1922, *Coll. ignot* s.n. (BM); Prov. de le Frontier N.-O excursion de Gittidas an Katawai, 4100 m, 15.7.1953; *R.R. Stewart* s.n. (BM); Prov. de le Frontier N.-O alpage an-dessue de Gittidas, 4300 m, 20.7.1953; *R.R. Stewart* 452 (BM); Mengandab, in short grazed turf, florets blue, 3600 m, 6.9.1956, *O.Polunin* 56/717 g (BM); Baltistan: Deosai plains, erect perennial herb, up to 2" tall, florets light purple, infrequent species, in moist open area near water canal, c.4000 m, late Aug, 2002, *Jan Alam & F. Karim* 1602 (KUH).

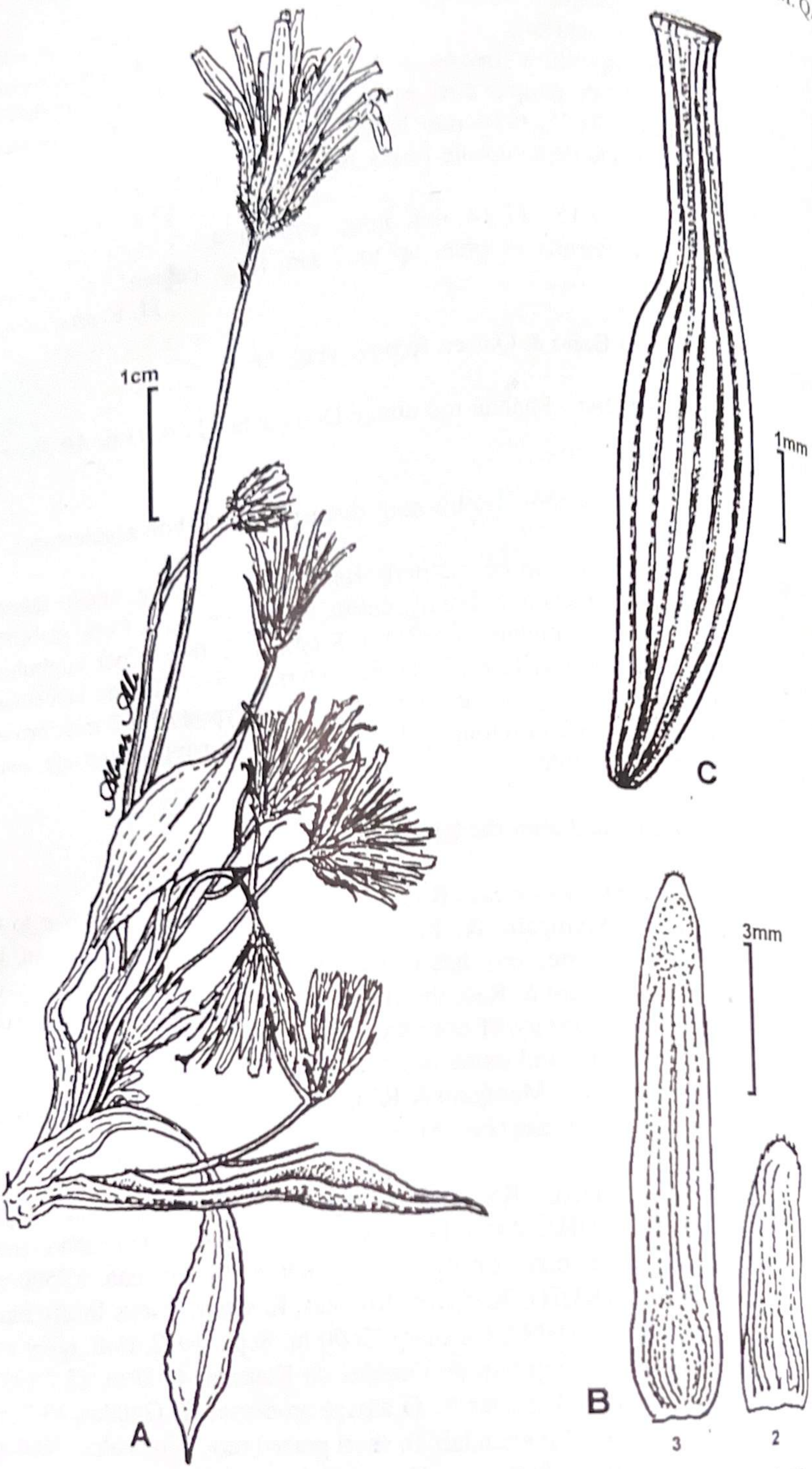

Fig. 1. *Cicerbita astorensis* Roohi Bano & Qaiser: A, habit; B(1-3), involucres phyllaries (oute inner); C, cypsela.

Distribution: - Pakistan (Chitral & Gilgit) and Kashmir (Fig. 2).

Ecology: - A plant of high altitude, grows between 2600 - 4000 m in open meadows and near water channels.

Flowering period: - August – September.

2. ***Cicerbita alii*** Roohi Bano & Qaiser, **sp.nov.** (Fig. 3)

Holotypus: Kashmir: Kolohoi valley, 27.8.1956, *O. Polunin* 56/567 (BM!).

Diagnosis: Species distincta caulibus crassis, circiter 1 cm in diametro, foliis subsessilibus, 10-18 (-20) x 3-5 cm, indivisis, acute, denticulato-serrulatis, foliis inferiorbus semi-amplexicaulibus, cypselis atro-griseis, oblanceolatis vel cylindricis, undulato-costulatis, rostro crasso concoloranti, pappo niveo.

Plant with stem up to 10 mm broad at the base, rigid. Radical leaves sessile, narrowed at the base, 10-18 x 3-5 cm, broad elliptic to oblanceolate in outline, sharply denticulate to serrulate, acuminate to mucronate, semiamplexicaul, sparsely hispid beneath; cauline leaves 4-6 x 1 cm. Capitula in fasicles, terminal, campanulate, 1.5-2.5 x 0.5-1 cm, 20-25 florets per capitulm; peduncle (3-) 6-10 cm long. Involucre phyllaries blackish green, 3-seriate, 20-22; outer ones (4-) 6-8 x 3-3.5 mm, ovate-lanceolate; inner most (10-)12-14 x 2-2.5 mm, broadly linear-oblong. Florets bluish - purple or mauve. Cypsela 5-7 x 2 mm, greyish black, somewhat cylindrical to oblanceolate, ribs and margin wavy; densly thick hairy, beak 2 mm long, concolorous, gradually formed; outer pappus 0.5 mm; inner 11-12 mm long, snowy white.

Etymology: The name is given after Prof. Dr. S. I. Ali, world known legume specialist, senior editor of Flora of Pakistan and Flora of Libya. He has contributed tremendously to the field of taxonomy.

Note: *Cicerbita alii* Roohi Bano & Qaiser is different from the rest of the taxa by having 1 cm broad stem, subsessile, 10-18(-20) x 3-5 cm, unlobed, sharply denticulate-serrulate, semiamplexicaul lower leaves; cypsela greyish black, oblanceolate-cylindrical, with wavy ribs; beak stout and concolorous; pappus snowy white. However, *C. alii* Roohi Bano & Qaiser resemble with the newly described species *C. gilgitensis* Roohi Bano & Qaiser by having cypsela with wavy ribs, concolorous beak and snowy white pappus. But it is sharply isolated from it by having up to 5 mm broad stem, petiolate and oblanceolate, entire, 7-10 x 0.5-2 cm lower leaves. The pollen of *C. alii* has polar area with centrally isolated echinae and ridges are distinct, where as in *C. gilgitensis* Roohi Bano & Qaiser echinae polar areas are scattered with indistinct ridges (Fig. 5).

Specimens examined: Gilgit Dist.: Haramosh, florets bluish-lilac, involucre black, on cliff faces and also in alpine pastures, c.3450 m, 30.7.1940, *Ludlow & Sherriff* 7367 (BM); Karakorum Range: Sokha glacier, river bank, Karakorum, moist rocks, 4500 m, 21.8.1939, *R. Scott Rusell* 1603 a (BM); Kishtawar Dist.: Bangar, Kashmir, florets mauve, on cliff, c.3450 m, 31.7.1943, *Ludlow & Sherriff* 9255 (BM); Kolohoi valley, Kashmir, florets bluish-purple, c.3600 m, earthy north facing grassy slopes, 27.8.1956, *O. Polunin* 56/567 (BM); ibid, florets deep lilac, north facing grassy slopes, *O. Polunin* 56/577 (BM); Mantnar Nullah, Bringhi valley, on open sere, 3900 m, 5.9.1940, *Ludlow & Sherriff* 8057 (BM); Musjid valley, 3900-4200 m, 27.7.1993, *J.F. Duthie* 13277 (BM).

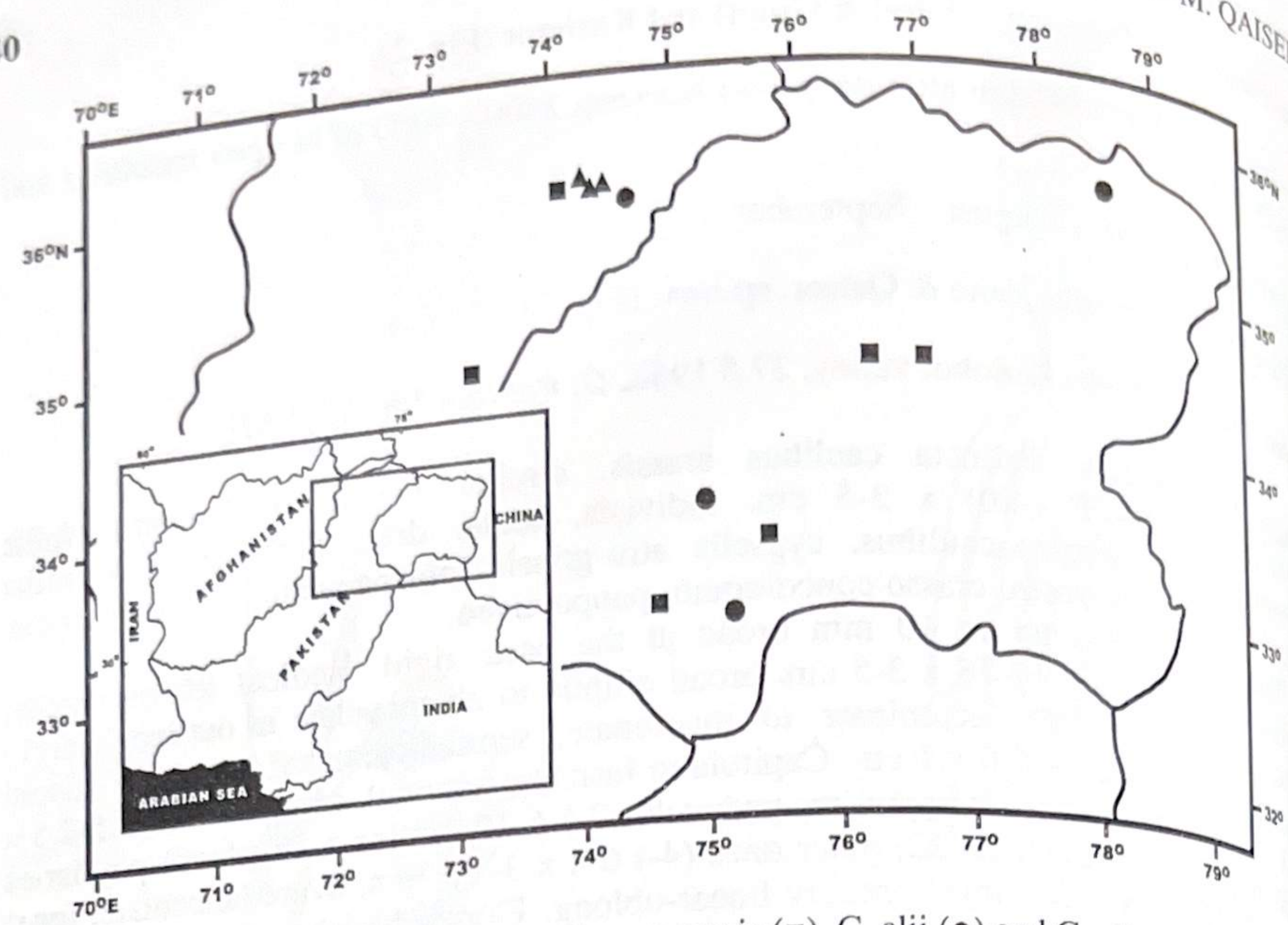

Fig. 2. Distribution pattern of Cicerbita astorensis (■), C. alii (●) and C. gilgitensis (▲)

Distribution: - Pakistan (Gilgit) and Kashmir. (Fig. 2)

Ecology: - A plant of higher altitude, grows on cliff faces, in alpine pastures, slopes, open areas and screes at the elevation between 3300–4500 m.

Flowering Period: July – September.

3. *Cicerbita gilgitensis* Roohi Bano & Qaiser, **sp.nov.** (Fig. 4)

Holotypus: Pakistan: Gilgit: Rai-juth between Khaltarow and Jutial nullah, Haramosh, 20.8.2004, *Sherwali Khan & Shabbir Hassan* 666 (KUH!)

Diagnosis: Foliis inferioribus oblanceolatis integerrimis petiolatis *Cicerbita lessertiana* var. *lessertiana* similes, praecipue differt cypselis aterrimis undulato-costulatis, rostro concoloranti et pappo niveo (non ut in *Cicerbita lessertiana* var. *lessertiana*, cypselis brunneis costulis rectis, rostro pallido, pappo sordide albo). Etiam *Cicerbita alii* costulis undulates, rostro concolorante nec non pappo niveo similes sed foliis inferioribus integerrimis oblanceolatis petiolatis statim dignoscenda.

Perennial herb, stem 15-20 cm tall and 3-5 mm broad. Radical leaves with narrow petiole, oblanceolate to spathulate, entire, mucronate, 7-10 x 1-1.5 cm. Capitula in fasicles, terminal, campanulate, 1.5-2 x 1-1.5 cm, c.32 florets per capitulum; peduncle long villous. Involucre phyllaries c.20, dark green, 3-seriate, flexuous villous hairy all over; outer ones 5-7 x 2 mm, ovate-lanceolate; inner ones 10-13 (15) x 1-1.5 mm, broad linear-oblong. Florets blue. Cypsela 6-7 x 2 mm, black, oblanceolate to cylindrical, ribs wavy, abruptly attenuate into 2 mm long, concolorous beak; outer pappus small; inner 9 mm long, snowy white.

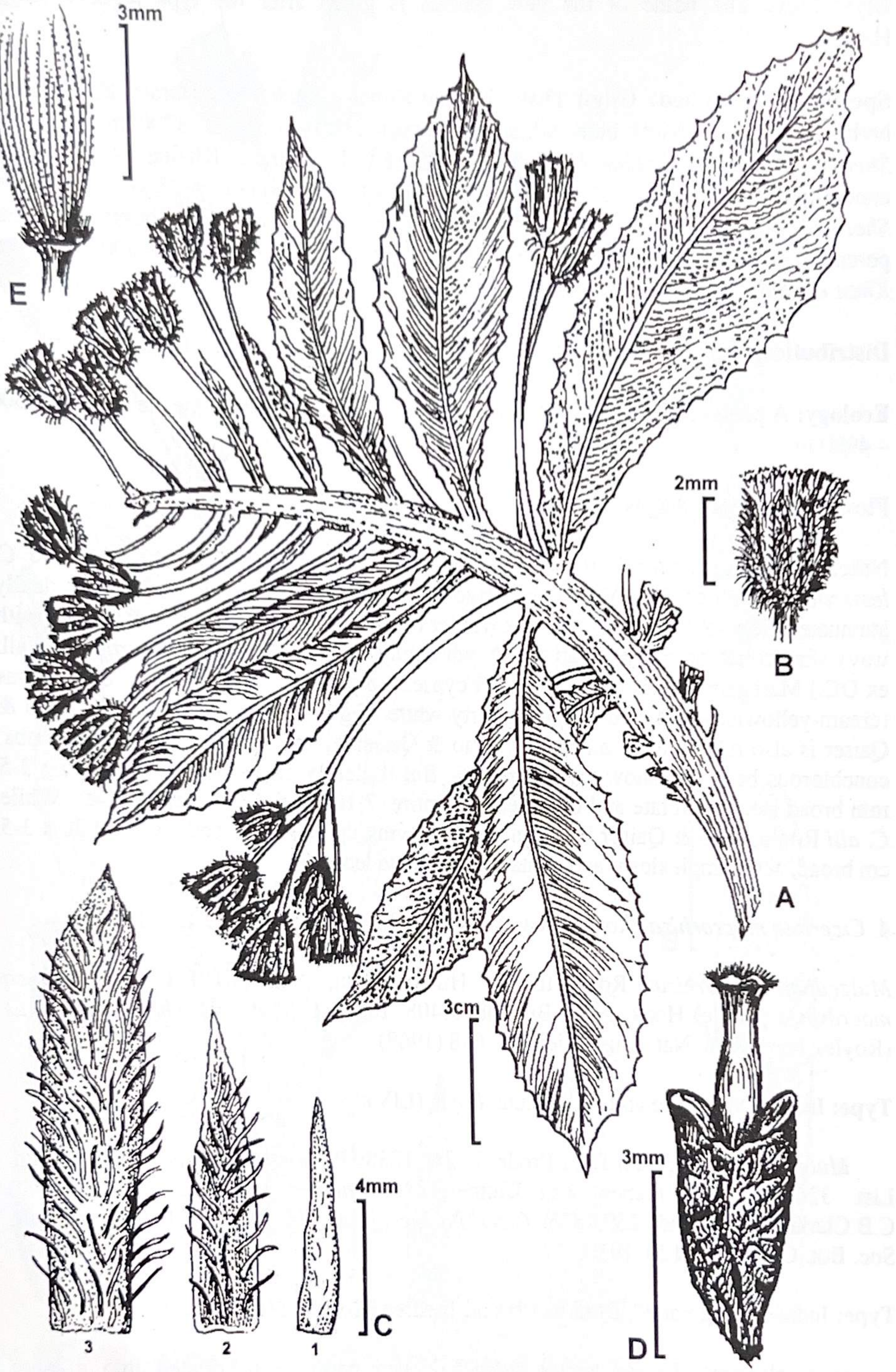

Fig. 3. *Cicerbita alii* Roohi Bano & Qaiser: A, habit; B, capitula; C (1-3), involucre phyllaries (outer to inner); D,cypsela; pappus.

Etymology: The name of the new species is given after the type locality (Gilgit, Haramosh)

Specimens examined: Gilgit Dist.: Khatun-Rungh, Khaltarow, Haramosh, perennial herb, 20 cm tall, florets blue, white latex, open grassy slope, ± 3700 m, 20.8.2004, *Sherwali Khan & Shabbir Hassan* 640,665 (KUH); Ichman Khaltarow, Haramosh, annual herb, up to 15 cm tall, florets blue, white latex, infrequent, ± 3500 m, 20.8.2004, *Sherwali Khan & Shabbir Hassan* 659 (KUH); Rai-juth between Khaltarow and Jutial, perennial herb, up to 15 cm tall, florets blue white latex, ± 4900 m, 20.8.2004, *Sherwali Khan & Shabbir Hassan* 666 (KUH).

Distribution: Endemic (known from type locality, Haramosh, Gilgit, (Fig. 2)

Ecology: A plant of higher attitude, grows on open grassy slopes, at the elevation of 3500 – 4900 m.

Flowering period: August

Note: *Cicerbita gilgitensis* Roohi Bano & Qaiser seems to be closely related to C. *lessertiana* (Wall.ex DC.) Mamgain & Rao var. *lessertiana* in having petiolate gradually attenuate below, oblanceolate, entire lower leaves but differ by having black cypsela with wavy ribs; concolorous beak and snowy white pappus. Whereas in *C. lessertiana* (Wall. ex DC.) Mamgain & Rao var. *lessertiana* cypselae are brown, ribs not wavy; discolorous (cream-yellowish) beak and pappus is dirty white (Fig. 4). *C. gilgitensis* Roohi Bano & Qaiser is also related to *C. alii* Roohi Bano & Qaiser by having cypsela with wavy ribs, concolorous beak and snowy white pappus. But it clearly differs from it by having 3-5 mm broad stem, petiolate and oblanceolate, entire, 7-10 x 0.5-2 cm, lower leaves. While *C. alii* Roohi Bano & Qaiser is recognized in having up to 1 cm broad stem, 10-20 x 3-5 cm broad, semi amplexicaul and dentate to serrulate leaves.

4. *Cicerbita macrorhiza* (Royle) Beauv., in Bull. Soc. Bot. Gen. (2) 2:120. 1910.

Mulgedium macrorhizum Royle, Ill. Bot. Himal. Mount. 251. t. 61. f. I. 1835; *Lactuca macrorhiza* (Royle) Hook. f., Fl. Bri. Ind. 3:408. 1881;. *Cephalorrhynchus macrorhizus* (Royle) Tuisl. Ann. Nat. Mus. Wien. 72: 618 (1968)

Type: India – Mussoore and kedarkanta, *Royle* (LIV).

Mulgedium laevigatum DC., Prodr. 7. 249.1838; *Prenanthes laevigata* Wall. Num. List. 3269/369 1831.nomen, non Blume 1826; *Lactuca laevigata* (Wall.ex DC.) C.B.Clarke, Comp. Ind. 269.1876; *Cicerbita laevigata* (Wall.ex DC.) Beauv., in Bull. Soc. Bot. Gen. (2) 2: 120. 1910.

Type: India: "in Kamaon", Blinkworth s.n., *Wallich* 3269 (G); Iso (K-W!)

Stem glabrous. Lower leaves slender-winged petiolate or dilated into a large orbicular toothed lobe at the base, pinnatifid-sect, distantly lobed, terminal lobe ovate-cordate, acute-mucronate, sinuate-toothed, 5-15 (-20) cm long, terminal lobe 1.5-3 x 1.5 2

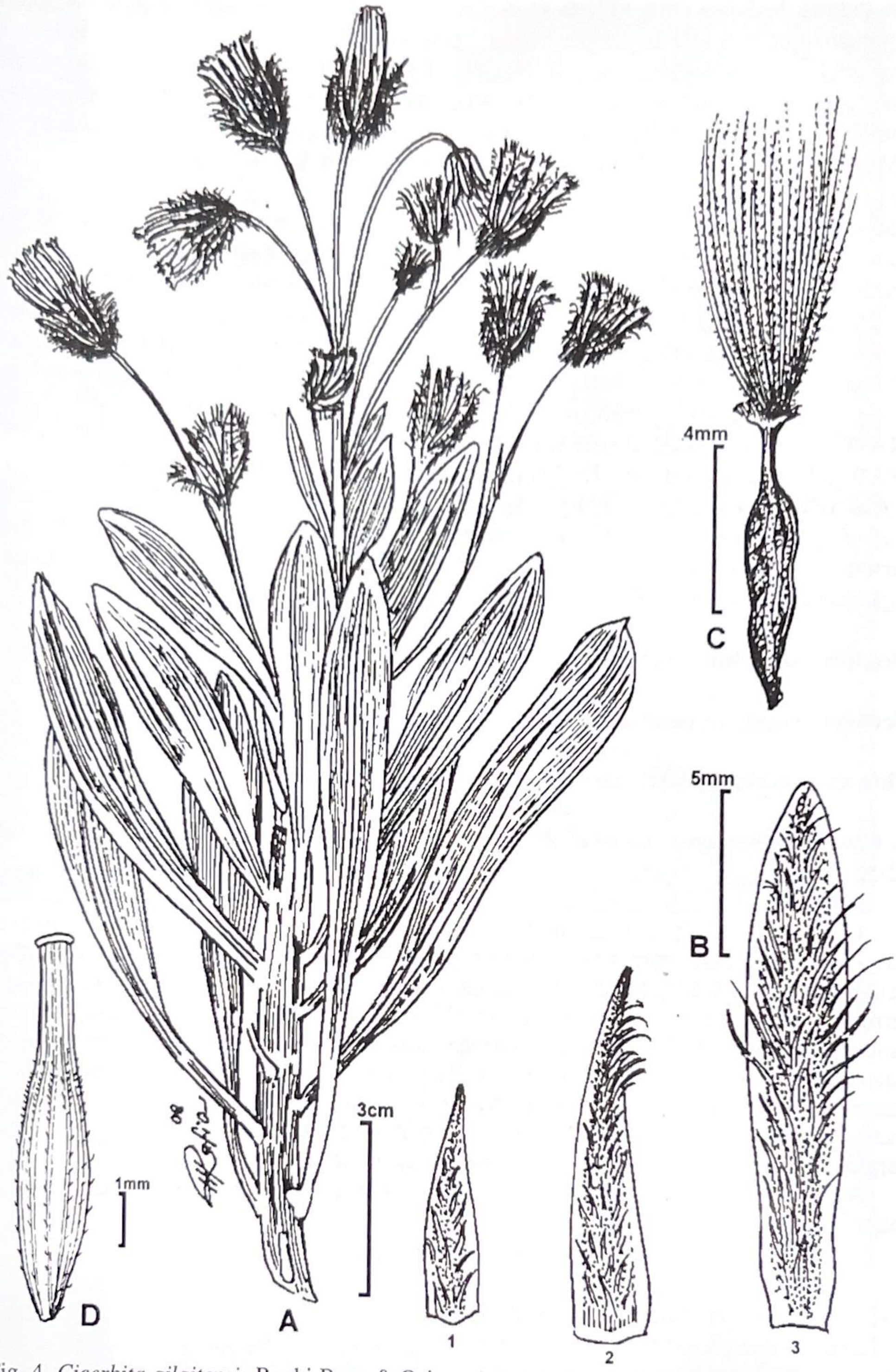

Fig. 4. *Cicerbita gilgitensis* Roohi Bano & Qaiser. A, habit; B(1-3), involucre phyllaries (outer to inner); C, cypsela; *Cicerbita lessertiana* (Wall.ex DC.) Mamgain & Rao var. *lessertiana;* D, cypsela.

cm, petiole 4-15 cm long, villous or glandular hairy. Synflorescence panicled. Capitula campanulate,13-15 florets, densly villous, pedunculate, peduncle bracteolate. Involucre phyllaries 12-15, 3 seriate, green to blackish, obtuse, outer ones 2-4 x 1-1.5 mm, ovate-lanceolate, middle ones 5-7 x 1-1.2 mm, lanceolate, inner most 11-13 x 1-1.2 mm, linear-oblong. Florets blue or purplish.Cypsela 5.5 x 1 mm, almost black, elliptic-oblong, 5-ribbed, attenuate into 1.5 mm long, pale beak; pappus biseriate, 6-7 mm long.

Specimens examined: - Chitral Dist.: Chitral, in cliff crevices, calyx black, florets mauve, 4.9.1958, *J.D.A. Stainton* 3218 (RAW); Gilgit Dist.: Ichman Khaltarow, Haramosh, annual herb, up to 15-25 cm tall, florets blue-purple, infrequent, white latex, 21.8.2004, *Sherwali & Shabbir Hassan* 651a (KUH); Peshawar Dist.: Tehri Road, Landour, florets pale blue, 2100 m, 3.9.1936, *R.R. Stewart* 15570 A (KUH); ibid, banks and walls, ± 2100 m, Oct, 1936, *R.R. Stewart* 15750 (RAW); Swat Dist.: Batain beyond Ushu, on rock crevices, 1800 m, 27.7.1953, *R.R. Stewart & A. Rehman* 25319, 25320 (RAW); Shonala, rocks, florets usually large, ± 3300 m, 22.8. 1955, *A. Rehman* 64 (RAW); Kashmir: Pahlgam, Kashmir, rock crevices, leaf only, ± 3300 m, 12.8.1920, *R.R.& I.D. Stewart* 5676 (RAW); Sonamarg, Kashmir, florets blue, 1800 m, 4.9.1921, *R.R. & I.D. Stewart* 6922 (RAW); Above Gulmarg, Kashmir, 3900 m 7.8.1929, *R.R. Stewart* 10330 (RAW); Above Chapri rest house, perennial herb with thick roots, florets light purple or mauve, 30.8.1971, *M.A. Siddiqui & Y. Nasir* 6522 (KUH, RAW).

Distribution: - Iran, Afghanistan, Pakistan, India, Nepal, Bhutan and China.

Ecology:- Grows in moist and shady places on rocks at the elevation of 1800-3900 m.

Flowering period: - July – September.

5. *Cicerbita lessertiana* (Wall.ex DC.) Mamgain & Rao in J. Bomb. Nat. Hist. Soc. 86 (2): 273.1989.

Caulescent, 15-25 cm tall herb. Stem 3-5 mm broad. Radical leaves petiolate-narrowed at the base, narrowly oblanceolate, entire- sinuate toothed, lyrate - pinnatifid, acute-mucronate, 4-20 x 1-3 cm; cauline leaves small, sessile, linear. Capitula in fasicles, terminal, campanulate, 1.5-2 x 0.8-1 cm, 25-30 florets per capitulum; peduncle long, villous. Involucre phyllaries 20-22, 3-seriate, dark green, villous at the base or all over; outer ones 5-7 x 1.5- 2.5 mm, ovate- lanceolate; inner ones 13-15 x 1-1.5 mm, broadly linear -oblong, obtuse.Florets blue or purple. Cypsela 6-8 x 1.5 mm, brown, ellipsoid, many ribbed, gradually attenuate into 1.5-2 mm long, cream – yellowish beak; outer pappus c.0.5 mm; inner 4-6 mm long, dirty or pale white.

A common and highly variable species, 3 varities are recognized on the basis of leaf shape.

Key to the varieties

1 +Leaves all entire, oblanceolate-spathulate ..... i- var. *lessertiana*
-Leaves lyrate-pinnatifidly lobed or mucronate toothed – dentate 2
2 +Leaves lobed, lyrate-pinnatifid ..... ii- var. *lyrata*
Leaves unlobed, sharply toothed – dentate ..... iii- var. *dentata*

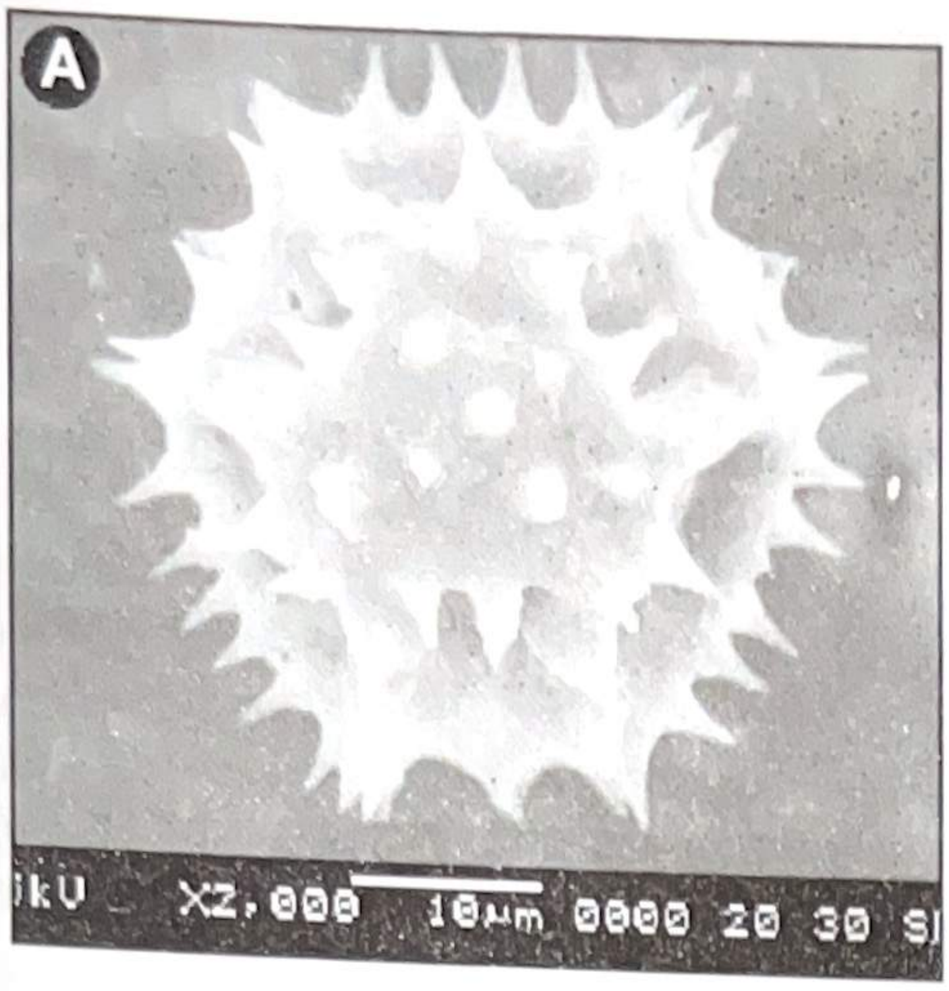

Fig.5. Scanning Electron Micrographs (SEM) of the pollen grains: *Cicerbita astorensis*: A, polar view; B, exine pattern. *Cicerbita alii:* C, equatorial view; D, polar view *Cicerbita gilgitensis*: E, polar view; F, exine pattern.

i. *Cicerbita lessertiana* (Wall.ex DC.) Mamgain & Rao var**. *lessertiana***

Mulgedium lessertianum Wall.ex DC., Prodr. 7:251. 1838;.*Lactuca lessertiana* (Wall.ex DC.) C.B. Clarke, Comp. Ind. 270. 1876; *Hierarcium lessertianum* Wall.Cat. 3254 nom.nud.

Type: India: Kamaon and Emodum, *Wallich* 3254, Cat. Comp. 364 (G.); Iso (K-W!)

Specimens examined: Baltistan: Deosai, Baltistan, ± 1450 m, 20.8.1966, *M.A. Siddique, Y. Nasir & Zaffar* 4201 c (RAW); Karpuch valley, 3600-3900 m, 9.7.1992, *J.F. Duthie* s.n. (BM); Kashmir: Kolahoi, Kashmir, florets lovely blue, Sep.1913, *Coll. ignot.* s.n. (BM); Near Kolahai Glacier, 3300-3600 m, *Mrs. M.A. Evershed* s.n. (BM); Zojila, Kashmir, florets blue, in grassy alpine pastures, 3450 m, 27.8.1940, *Ludlow & Sheriff* 8032 a,b (BM); Gadsar, Kashmir, open grassland , 3600 m, 17.8.1940, *P.M. Pinfold* 346 a,f (BM).

Distribution: Pakistan (Baltistan, Gilgit), India & Kashmir.

Ecology: Grows in open grasslands, alpine pastures between 3300-3900 m.

Flowering period: August – November.

ii. *Cicerbita lessertiana* (Wall.ex DC.)Mamgain & Rao **var. *lyrata*** (Decne.) Roohi Bano & Qaiser, **stat.nov.**

Melanoseris lyrata Decne., in jacquemont, Voy. Bot. Ind. 4: 101. t. 109.1844; in Walp. Rep. 6:354.1846. *Lactuca lessertiana* var. *lyrata* (Decne.) C.B. Clarke, Comp. Ind. 270. 1876; *Lactuca lessertiana* subsp. *lyrata* (Decne.) Stebbins in Ind. For. Records Bot.1(6):240. 1939; *Cicerbita lessertiana* subsp.*lyrata* (Decne.) Mamgain & Rao in Hajra *et al.*, Fl. Ind. 12: 272. 1995.

Specimens examined: Gilgit Dist.: Ichman Khaltarow Haramosh, annual herb up to 15-25 cm tall, florets blue-purple, latex white, on open grassy slopes, ± 3500 m, 21.8.2004, *Sherwali Khan & Shabbir Hassan* 651b (KUH); ibid; *Sherwali Khan & Shabbir Hassan* 667, 668 (KUH); Astor Dist.: Rama valley, S.W. of Astor, herb with thick woody rootstock, leaves green, 2", florets purplish blue, 2 ½ - 3 cm, on stony ridge & melting snow, 3900 m, (35" 20' W: 75 50' E.), 20 3.8.1967, *T.E. Lankester & T.A.S. Pearson* 1384 a,b,c (BM); Kala pani, Motom nullah, Astor, semi erect, perennial herb, up to 20 cm tall, florets blue, c.3300 m, 5.9.2005, *Ali Noor* 303 (KUH); Baltistan Range: Karpuchu valley; 3600-3900 m, 9.7.1992, *J.F. Duthie* s.n. c (BM); Deosai plains, Baltistan, ± 3900 m, 6.8.1955, *E. Nasir & G.L. Webster* 6377 (RAW); Deosai, Baltistan, ± 1450 m, 20.8.1966, *M.A. Siddique, Y. Nasir & Zaffar* 4201 a,b (BM, RAW); ibid; Bara Pani, ibid, semi erect, perennial herb, florets violet, fairly common, on river bank, ± 3900 m, 25.8.2002, *Jan Alam & Fazal Karim* 1415 (KUH); ibid; ± 4000 m, 18.8.2002, *Jan Alam & Fazal Karim* 1399 (KUH);Burzil Chowki to Deosai plains, ± 3900 m, 28.7.1940, *R.R. Stewart* 19984 (KUH); Burji La, above Skardu, 4200-4500 m, 31.7.1940, *R.R. Stewart* 20125 (RAW); Kashmir Prov.: Sonamarg, 3000-3900 m, Sep, 4, *R.R. & I.D. Stewart* s.n. (RAW); Phalgam, Kashmir, 3000 m, 27.8.1920, *R.R. & I.D. Stewart* 5811 (RAW); Gund, Kashmir, ±2400 m, July, 1912-1923, *R.R. Stewart* s.n. (RAW); Above Gulmarg

Kashmir, 3900 m, 7.8.1929, *R.R. Stewart* 10330 (RAW); Zanskar, Kashmir, 1931, *Mich* 2983 (RAW); Astonmarg, amongst short grass on open hill side, 10500', Aug 1936, *M.K. Timins* 205 a,b,c,d (BM); Shishnag, Kashmir, Aug, 1938, *Mohindar Nath* s.n. (RAW); ibid, *Dawarka Nath* 27 (KUH); Zoji La, Kashmir, florets blue, in grassy alpine pastures, c.3500 m,27.8.1940, *Ludlow & Sheriff* 8032 c (BM); Zoji Pass, Ladak Road, 30.8.1940, 3300-3600 m, *R.R. Stewart* 21225 (RAW); Gadsar, Kashmir, open grassland, 3600 m, 17.8.1940, *P.M. Pinfold* 346 b,c,e (BM); Khelanmarg, Kashmir, florets orange-yellow, 3290 m, 11.8.1956, *O. Polunin* 56/192 a,b,c,d (BM).

Distribution: - Pakistan (Gilgit, Baltistan), India and Kashmir.

Ecology: - Grows in open grassy, hillside, stony ridges, between 1400-4000 m.

Flowering period: - July-November.

iii. *Cicerbita lessertiana* (Wall.ex DC.) Mamgain & Rao **var. *dentata*** (DC.) Roohi Bano & Qaiser, **stat.nov.**

Mulgedium lessertianum var. *dentatum* DC., Prodr. 7:251.1838; *Lactuca lessertiana* (Wall. ex DC.) C.B. Clarke subsp. *dentata* (DC.) Stebbins in Ind. For Records Bot.1 (6):240.1939; *Cicerbita lessertiana* (Wall. ex DC.) Mamgain & Rao subsp. *dentata* (DC.) Mamgain & Rao in J. Bom. Nat. Hist. Soc. 86. (2): 273.1989.

Type: Described from India, "prov. Boreali-Occid," *Royle* (G).

Specimens examined: Swat Dist: Sarum, Kaghan, 14.8.1897, *J.F. Duthie* s.n. (RAW); Astor Dist.: Shatan top above Dombubho, open place, erect perennial herb, flowers blue, 9 cm tall, ± 3500 m, 11.9.2006, *Ali Noor et al.* 584 (KUH); Kashmir: Tragbol Pass, 3600 m, 24.7.1919, *R.R. & I.D. Stewart* 4601 a, b, c (RAW); Khelanmarg, stony ground, Florets orange-yellow, 11.8.1956, *O. Polunin* 56/192 (BM); Baltistan Range: Deosai plains, Road to Baltistan, 3900 m, 30.07.1940, *R.R. Stewart* 20084 (RAW); Sardarkottii on way to Burzil pass, small perennial, erect, 5-10 cm tall, florets blue, ± 3900 m, 7.8.2003, *Sherwali Khan & M. Ali* 496 (KUH).

Distribution: Pakistan, India and Kashmir.

Ecology: Grows in open places and stony grounds, ascending up to 3500-3900 m.

Flowering period: July-September.

Note: Mamgain & Rao (1989, 1995) have recognized three subspecies under *C. lessertiana* (Wall. ex DC.) Mamgain & Rao on the basis of leaves. The type subsp. has entire leaves. The subsp. *dentata* (DC.) Mamgain & Rao, based on *Mulgedium lessertianum* var. *dentata* DC. is characterized by having dentate leaves, while subsp. *lyrata* (Decne.) Mamgain & Rao, based on *Melanoseris lyrata* Decne., has lyrate-pinnatifid leaves. However, some intermediates are also present and both the taxa overlap in distribution. Therefore, they are treated here as varieties.

6. *Cicerbita rapunculoides* (DC.) Beauv., in Bull. Soc. Bot. Gen. 2 (2): 127.1910.

Mulgedium rapunculoides DC., Prodr. 7:249. 1838; *Lactuca rapunculoides* (DC.) Clarke, Comp. Ind. 268.1876;

Type: Nepal: "[…] anno 1821 specimen misit", *Wallich* (G-DC).

Stem erect, slightly pubescent apically, paniculately branched above. Leaves simple, petiole narrow, 10-15 cm long, lamina pinnatifidly lobed, ovate-triangular in outline, acute, hastate-truncate at the base, subentire-sinuate toothed, auricled, 15-22 x 3-5 cm, upper sessile, lanceolate. Capitula panicled terminally, cylindrical, 1.5 x 0.5 cm, 5 florets per capitulum, peduncle slender bracteate. Involucre phyllaries (6) 8-10, 2-seriate, dorsally papillose, outer 3-4 x 1-1.5 mm, ovate-lanceolate, blackish; inner ones 12-15 x 1 mm, linear-oblong. Florets purplish. Cypsela 6.5-9 x 1.2 mm, brown, ellipsoid-fusiform, 5-7 ribs on each side, scabrid-hispid, abruptly attenuate into 1.5-3 mm long, concolorous pale beak; outer pappus yellow, short, inner 7-8 mm long, dirty white, fragile.

Specimens examined:- Astor Dist: Burzil Pass, ± 3300 m, 27.8.1939, *R.R. Stewart* 19011 (RAW); Burzil Chowki, ± 3300 m, 27.71940, *R.R. Stewart* 19880 (KUH); Burzil Chowki to Deosai Plain, ± 3600 m, 28.7.1940, *R.R. Stewart* 19983 (RAW); Chilam valley near Shankargarh, ± 3000 m, 10.8.1939, *R.R. & I.D. Stewart* 18755 (RAW); Upper Astor: Sochar pass, ± 3090 m, 18.8.1955, *E. Nasir & G.L. Webster* 6522 (RAW); ibid; Kashmir: Sonamarg, Kashmir, 3090 m, 24.8.1876, *C.B. Clarke* 30836 D (BM); ibid; 3000–3300 m, 5.8.1921, *R.R. Stewart* 6546 (RAW); ibid, 19.8.1946, *R.R. Stewart* 22360 (RAW); Upper Sind valley, Kashmir, Aug,1928, *R.R. Stewart* 12728 (RAW); Pahlgam Sept.,1928,*Col.Houston* s.n.(RAW);Below Gadsar, Gangabal region, ±3300 m,11.8.1939, *R.R. Stewart* 18282 (RAW); Badwan to Karakbol, ± 2500 m, 30.8.1939, *R.R. & I.D. Stewart* 19241 (RAW); Above Tragbol, Kashmir, ± 3000 m, 31.8.1939, *R.R. & I.D. Stewart* 19287 (KUH); Minimarg, Kashmir, ± 2700m, 30.8.1939, *R.R. & I.D. Stewart* 19158 (RAW); Kum Pather, Masjid Gali, 3300-3600 m, 13.8.1939, *R.R. & I.D. Stewart* 18463 (KUH); Zoji Pass, ± 3300 m, 30.8.1940, *R.R. Stewart* 21224 (KUH); Karakorum Sokha glacier, river bank , 3700-4200 m, 24.8.1939, *R. Scott Russell* 1710 (BM); Burzil Kashmir, ± 3400 m, 28.7.1876, *C.B. Clarke* 29717 b (BM).

Distribution: Eastern Afghanistan, Pakistan, Kashmir, India and Nepal.

Ecology: Grows in open grassy and shady slopes and along river bank at high elevation between 2500-4200 m.

Flowering period: July-September.

7. *Cicerbita decipiens* (C.B.Clarke) Beauv., Bull. Soc. Bot. Gen. 2 (2):127. 1910.

Lactuca decipiens C.B. Clarke, Comp. Ind. 266.1876.

Perennial plant. Stem 2-4 ft., glabrous – minutely pubescent, erect 25-70 cm tall. Radical leaves sub sessile or petiole with dilate base, blades lobed or pinnatifid, sinuate-denticulate, acute- apiculate, terminal lobe ovate – triangular, hastate 3-9 (12) x 4-6 cm, cauline leaves sessile, somewhat lyrate-pinnatilobate, incised dentate, auriculate - sessile amplexicaul. Synflorescence paniculate - somewhat racemose. Capitula cylindrical, 1.5-2 x 0.5 cm, 6-8 florets per capitulum; peduncle thin, bracteolate. Involucre phyllaries 1

15, 2-3 seriate, long papillose dorsally, outer most 3-5 x 2 mm, ovate; middle ones (6-) 8-10 x 2–2.5 mm, ovate-lanceolate; innermost 12-16(-18) x 1.5-2 mm, broadly linear-oblong. Florets blue. Cypsela 5-8 x 1.2, brown-blackish, narrow elliptic-oblong, compressed, 5-7(-9) narrow ribs, finely scabrid, attenuate into 2.5 mm, concolorous beak, slightly whitish-pale apically. Pappus 7-8 mm long, dirty white.

A fairly common and highly variable species can be differentiated into 3 varieties.

Key to the varieties

1 + Leaves entire or lobed, if lobed, then upper lobe is not further lobed, terminal lobe broad hastate or triangular ..... i-var. ***decipiens***
-Leaves and upper lobes further lobed, pinnatifid with shallowly and deeply cut lobes **2**
2 + Lower leaves up to 6 mm broad, 10-30 cm long, bipinnatifid up to 0.5 cm broad with toothed, acute segments ..... ii- var. ***multifida***
- Lower leaves up to 4 mm broad, 8-15 cm long, bipinnatifid up to 0.2 mm broad with entire, lyrate segments ..... iii-var. ***pakistanica***

i. ***Cicerbita decipiens*** (C.B. Clarke) Beauv. var. ***decipiens***

Types: Habit in Kashmir et in provinica adjacent Dras, 8000-10,000 Ped." *Thomson.* (K!).

Specimens examined: Chitral Dist.: Shishi (Lohigal An), florets violet, on crevice, between (35°.N. 71°.48' E. 35°.45' N., 72°.O'E.), 27.7.1958, *S.A. Bowes Lyon* 138 (BM); Gilgit Dist.: Naltar, Gilgit, 3600 m, 20.7.1954, *R.R. Stewart* s.n. (RAW); ibid, c.60 cm, florets light purple, 8.9.1981, *Kamal Akhter Malik & S. Nazimuddin* 1843 (KUH); Ghaimash, Karimabad, Hunza, erect perennial herb up to 40 cm tall, florets pink-purple, common, grow in cultivated field as weed, 2340 m, 20.6.2001, *Jan Alam* 40 (KUH); Hone mountain, above Karimabad, Hunza, erect herb up to 13", florets bluish purple, grow in moist place, 3500 m, 30.7.2001, *Jan Alam* 416 (KUH); ibid, semi erect, perennial herb,up to 0.6m tall, grows in canyon (rocky crevice), less common species, c.3300 m, 31.9.2007, *Jan Alam & Naik Alam* 4070 (KUH); ibid; Humal on way to Khaltarow, Haramosh, perennial herb, up to 1m, erect, basal leaves very large, florets blue, common, 30.7.2003, *Sherwali Khan & Shabbir Hassan* 384, 384 A (KUH); Khayeh Khaltarow, Haramosh, Gilgit, erect perennial herb, 30 cm tall, florets blue, on moist shady places, 3500 m, 16.8.2008, *Sherwali Khan & Shabbir Hassan* 1118 (KUH); Khayeh, c.10 km from Sharal Khaltarow, erect perennial herb, 30 cm tall, florets blue, on moist shady places, 3500 m, 16.8.2008, *Sherwali Khan & Shabbir Hassan* 1121 (KUH); Ultar Nullah, Karimabad, Hunza, erect perennial herb up to 40 cm tall, florets blue, c.3300 m, 22.7.2005, *Jan Alam & Naik Alam* 3241 (KUH); ibid; Kohistan Dist.: c.2 miles from Comella on way to Gilgit, 1 m high, florets yellow, 13.5.1983, *S. Omer, S. Nazimuddin & A. Wahid* 776 (KUH); Swat Dist.: Kagan Valley between Balakot (approx.34° 35' N.,73° 20' E.) and Babusar Pass (approx. 35°10' N.,74° 2' E.), July-Sept, 1954, *John Abel* 107 (BM); Astor Dist.: Burzil Chowki, Srinagar, Gilgit Road, on rocky ravine beds, florets mauve, c.3500 m,17.9.1931, *Lludlow* 858 (BM); Godai, above Astor, c.2500 m, 24.8.1939, *R.R. Stewart* 18946 (RAW); Gudai village near water channel, erect perennial herb up to 35 cm tall, florets blue, c.2700 m, 16.9.2005, *Ali Noor et al.* 384 (KUH);

Rama, 3000 m, 13.8.1955, *E. Nasir & G.L. Webster* 6462 (RAW);; Baltistan Rama, Satpura Nullah, above Skardu, erect, branched, perennial herb, up to c.45 cm, flowers pink-purple, grows along stream in stony place, c.2900 m, infrequent, 1.8.2004, *Jan Alam & Noor Din* 2861 (KUH); Kashmir: Between Sonamarg and Koolum, Kashmir, flowers about 10 in a head, ligules broad, blue-lilac with pink patch at base, no radical leaves when in flowering, 8.10.1913, *M.A. Evershed* s.n. (BM); Battal, Sando valley, 1800 m, 4.8.1922, *R.R. Stewart* s.n. (RAW); Badwan to Karagbal, Kishenganga valley, 2400-2500 m, 30.8.1939, *R.R. Stewart* 19270 (KUH, RAW); Vishanar, Kashmir hills above Lachipura, growing in shelter of boulders, florets lilac, 3600 m,17.8.1940, *P.M. Pinfold* 369 (BM); Sonamarg, Kashmir,1800 m, 15.8.1928, *R.R. Stewart* 9885 A (RAW); ibid, c.3300 m, Sep.,1931, *R.R. Stewart* 12730 (M); Sonamarg road, plant up to 3'6", common on banks by roadside, florets mauve, c.2250 m, 19.8.1940, *P.M. Pinfold* 389 (BM); Sonamarg, florets lilac, 2700 m, 25.8.1975, *C.B. Clarke* 27709 A (BM); Bagicha to Old Indusvalley, Ladak, 2500-2700 m, 23.8.1940, *R.R. Stewart* 20981 (RAW); ibid; Nanga Kharbu, Ladak road, c.2700 m, 27.8.1940, *R.R. Stewart* 21088 (KUH); Mengandar, Kashmir, earthy banks, florets blue, c.3500 m, 6.9.1956, *O. Polunin* 56/729 (BM); Kashmir, temperate region, 2400-2700 m, *T.T.* s.n. (BM).

Distribution: Afghanistan, Pakistan, Kashmir, India and Nepal.

Ecology: Grows on open moist shady slopes, on rocky ravine beds and along streams the elevation between 2500-4000 m.

Flowering period: July – November.

ii. *Cicerbita decipiens* (C.B. Clarke) Beauv. var. ***multifida*** (Hook.f.) Roohi Bano & Qaiser **comb. nov.**

Lactuca decipiens C.B. Clarke var. *multifida* Hook.f., Fl. Bri. Ind. 3:407. 1881.

Syntypes: Kashmir, Thomson(K!), Clarke(K!)

Specimens examined: Chitral Dist.: Mahtantergah, Chitral, on dry pastures, 3000-3[illegible] m, 9/10.8.1954, *Dr.F. Schmid* 2218 (RAW); ibid, 3240-4000 m, 9/10.8.1954, *R.R. Stewart* 2218 (RAW); Shishi (Lohigal), florets violet, on crevice, c. 3700 m (Between 35°.35' N. 71°.48' E. 35°.45' N., 72°.O'E.), 27.7.1958, *S.A. Bowes Lyon* 138 (BM); Gilgit Dist.: Burzil chowki, ± 3300 m, 27.8.1939, *R.R. Stewart* 19115 (RAW); 7 miles from Baurawai on way to Babusar Pass, erect herb, 30 cm in height, ray & disc florets purple, on the hills, 13.8.1971, *S. Abedin & M. Qaiser* 8993, 8994 (KUH); Lower Naltar, Gilgit (N.A.), erect, perennial herb up to 30", with drooping heads, florets bluish purple, [illegible] along small stream, ± 2500 m, 28.6.2003, *Jan Alam & Mehboob Ali* 1879 a,b (KUH); Swat Dist.: Near Kalam, above 2100 m Aug, 1955, *A. Rehman* 135 (RAW); Swat Maluk, Kaghan, florets purple, ± 3100 m, 21.9.1984, *Todd Nachovitz* 280 (RAW); Astor Dist.: Rama, Gilgit agency, 3000 m, 13.8.1955, *E. Nasir & G.L. Webster* 6462 (RAW); Rama valley, S.W. of Astor, Pakistan, erect herb, 1-2 ft. tall with thick taproot, leaves green, florets 15-20 mm long a cross with disc florets purple & rays purple, wood but bark is partial shade, 3100 m, (35°.20' W. 75°.50' E.), 28.7.1969, *T.E. Lankester & T.A. Pearson* TEL 1244 (BM); Between Gudai and Chilam, erect, 1 m in height, florets [illegible]

2.9.1988, *S. Omer & M. Qaiser* 2512 (KUH); ibid; Peer Route village on way to Rattu mountain, erect perennial herb, up to 30 cm tall, florets blue, on sandy mountain slope, 3100 m, ± 2700 m, 28.8.2005, *Ali Noor & A. Motalib* 155 (KUH); ibid, 2250 m, 28.8.2005, *Ali Noor* 188 (KUH); Kalapani on way to Kamri top from Mamo- dass, semi erect perennial herb, up to 35 cm tall, florets violet, grow on moist gentle slope, ± 3300 m, 6.9.2005, *Ali Noor & M. Alam* 356 (KUH); Kashmir.: Sonamarg, 2700-3000 m, 22.7.1921, *R.R. & I.D. Stewart* 6380 (RAW); Pahlgam, Kashmir, 2700 m, Aug, 1927, *R.R. Stewart* 13596 (RAW); Below Kum Pathar toward Tilel valley, ± 3000 m 14.8.1939, *R.R. Stewart* 18546 A (RAW), Suru-Sirimarg, Suru valley, Kashmir, Aug,1912, *R.R. Stewart* s.n. (RAW); Kharbo, Ladak, July 1912-13, *R.R. Stewart* 143 (RAW); Zoji Pass beyond gangabal lakes, ± 3600 m, 10.8.1939, *R.R. Stewart* 18220 (KUH); Above Chorwan, Gilgit Road, ± 2700 m, 25.7.1940, *R.R. Stewart* 19711 (RAW Baltistan range: Kande to Hushe, Baltistan, ± 2700 m, 3.7.1955, *E. Nasir & G.L. Webster* 5949 (RAW); Satpura nullah, 3600-3900 m, 13.7.1997, *J.F. Duthie* 11991 (BM).

Distribution: Afghanistan, Pakistan, India and Nepal.

Ecology: Grows in crevices, open moist shady slopes, ascending from 2500-4000 m.

Flowering period: July – September.

iii. *Cicerbita decipiens* (C.B.Clarke) Beauv. var. ***pakistanica*** Roohi Bano & Qaiser **var. nov.**

Diagnosis: Foli basalia usque n ad 4mm lata, 8-15 cm longa, bipinatifida, segmentis usque ad 0.2 mm lata, integris, lyratus.

Holotypus: Astor: Rama on way to Rama lake on hill slopes, 3200 m, 27.7.2007, *Ali Noor* 792 a (KUH!).

Specimens examined: Astor Dist.: Rama rest house, 20-25 cm in height, florets purple, 3100 m, 30.8.1988, *S.Omer & M.Qaiser* 2337 (KUH); Rama on way to Rama lake, Astor (N.A.), erect prennial herb, florets purple, common on hill slopes, 3200 m, 27.7.2007, *Ali Noor* 792 a, b (KUH); Kashmir: Sonamarg, 5.8.1921, *R.R. Stewart* 6545 (M); ibid, 2700-3000 m, 22.7.1921, *R.R. & I.D. Stewart* 6782 (RAW); Zoji Pass, Ladak Road, florets lavender, ± 3300 m, Aug, 1928, *R.R. Stewart* 9958 (RAW); Baltistan range: Karakorum, radical leaves very variable, sometime nearly entire, florets c.5, blue, 3600 m, 7.8.1876, *C.B. Clarke* 30145 (BM); Thalle La, Baltistan, 3600-3900 m, 15.8.1940, *R.R. Stewart* 20700 (RAW); Near Kasurmik, Baltistan, 2700- 3000 m, 16.8.1940, *R.R. Stewart* 20802 (RAW); ibid; Satpura nullah, above Skardu, perennial herb, up to 25", florets purple, on gravel slope along with water canal, 30.8.2002, *Jan Alam* s.n. (KUH); Satpura nullah, erect perennial herb, up to 25", florets purple, grows along stream bank, ± 3800 m, 24.8.2003, *Jan Alam & M. Qaiser* 2122 (KUH).

Distribution: Pakistan, Baltistan, Kashmir

Ecology: Grows between 3000-3900 m along stream banks and slopes.

Flowering period: July – September

8. *Cicerbita benthamii* (C.B Clarke) Roohi Bano & Qaiser **comb.nov.**

Lactuca benthamii C.B. Clarke, comp.Ind. 273.1876; Hook f., Fl. Bri. Ind. 3: 411. 1881; Mamgain & Rao in Hajra *et al.*, Fl.Ind. 12:284. f. 69. 1995.

Type: Kashmir: Karang and Kerang, 12-15000 ft., *Stoliczka* (K!).

Plant nearly glabrous, 5-12 cm tall. Leaves mainly radical, glaucous, spathulate to spathulate-oblong, 1.5-2 x 0.8x 1cm, entire or obscurely dentate, tri-nerved, slightly narrowed below: petiole 2.5-4 cm long. Synflorescence corymbose. Capitula cylindrical, narrow, blackish, 1-15 x 0.5 cm, pedunculate, 1.5-2 cm long with few bracts. Involucre phyllaries 2- seriate, outer 2-3x0.5 mm, lanceolate-ovate; inner ones 8, 8-9 x 1.5-2 mm, linear to oblong, margin hyaline, darker in the centre Florets bluish purple to pure purple. 10-12 per capitulum. Cypsela immature; pappus biseriate, 5-7 mm long, dirty white to pure white.

Specimen examined: Shimshal valley, lower Phurzin on way to lake, on dry sandy places, small perennial herb, up to 5 cm tall, florets blue, rare, 3600 m 24. 7.09, *Sherwali Khan* S. W.05 (KUH).

Distribution: Pakistan and India

Ecology: Grows in dry sandy places at high elevation between 3500-4500m

Flowering period: July – August.

9. *Cicerbita polyclada* (Bioss.) Beauv. in Bull. Soc. Bot. Geneve. 2:131.1910.

Zollikofera polyclada Boiss., Fl. Or.3:827.1875 p.p. quoad plantam Bungeanam e Khorasan, *Launaea polyclada* (Boiss.) Burkill, Working List, Fl. Pl. Baluch. 44. 1909. *Cephalorrhynchus polyclada* (Bioss.) Kirp., Fl. USSR.29:350. Pl. XX. f. 8.1964; Rech. f., l22: 215. t.153, 202, f. 9 & 10. 1977.

Lectotype: Iran: East Khorsan: in mountains between Nischapur and Mesched, *Bunge*, 258 p.p. (G). (Designated by K.H. Rechinger 1977).

Lactuca intricatissima Rech.f., Dan. Biol. Skr. 8, 2: 207.f.143 & 145.1955. Kitam., in Res. Kyoto Univ. Exp. Karak. and Hinduk. 2:431. 1955.

Type: Afghanistan: Lorinj Pass, 3000 m, dry slopes, plant 30 cm tall, flowers rose coloured, 27.8.1939, *Koelz,* 13740 (W).

Perennial, semishrub, glabrous, often glaucous-green, many stemmed, bushy habitat. Stem 15-40 cm high, dichotomous, divaricate-intricately branched, terete. Basal leaves rosulate, shortly indistinctly petiolate, lamina 2.5-4.5 x 1.2 cm, lyrate-pinnatisect, laterally 1-3 segments, sinuate toothed amplexicaul; cauline leaves often absent or reduced, upper most leaves scaly present on peduncles, indistinguishable from outer involucral bracts. Capitula 1-4 cm long including peduncle, thin, terminal, florets 8-12 per capitulum. Involucre phyllaries 11-13, biseriate, primarily subcylindric afterward funnel like, acute, narrow palely margin; outer triangular-lanceolate; inner in 1-equal

series, 7-8 mm long, sublinear; outer 3-times shorter than inner.Florets rosy-pink-lavender. Cypsela 3-4 mm long including beak, oblong-linear, light yellow, compressed, 10-14 ribbed, glabrous, attenuate up to 1 mm long beak; pappus 4-5 mm long, white.

Specimens examined: Quetta Dist: Baluchistan, Brahiman, 14.5.1956, *W.A. Dick-Peddies* 58 (RAW).

Note: Rechinger (op.cit.) has cited *Stainton* 2506 (W), collected from Pakistan, Chitral district, Istar ad fl. Turikho, 2100 m. we have examined only one specimen from Baluchistan.

Distribution: An Irano- Turanian element, Pakistan, Afghanistan, Iran, C. Asia.

Ecology: -Occur along banks of mountains, stream and lakes or near edges of glaciers and on dry slopes.

Flowering period: -August-October.

10. *Cicerbita picridiformis* (Bioss.) Roohi Bano & Qaiser **comb. nov.**

Lactuca picridiformis Boiss., Fl. Or. 3:807. 1875; R.R. Stewart in Nasir & Ali, Ann. Cat. Vas. Pl. W. Pak. Kashm. 759. 1972. *Cephalorrhynchus picridiformis* (Bioss.) Tuisl. Ann. Nat. Mus. Wien 72: 619.1968; Rech.f., l.c. 213. t. 151, 202. f. 5 & 6.

Type: Pakistan, Baluchistan, Siriab, *Stocks* 1075 (G, Iso-K).

Lactuca scoparia Rech. f. & Koeie, Dan. Biol. Skr. 8, 2: 211. f. 146.1955.
Cicerbita scoparia (Rech. f. & Koeie) Kitam., Acta Phyto. Geo. Bot. 17: 35. 1957.

Type: Afghanistan: Ghorband, 1800 m, 26.8.1948, *Koeie* 2911 (W), Isotype (C).

Chondrilla scoparia Rech. f., Aellen & Esphandri., in Oesterr. Bot. Z. 97:259. 1950.
Chondrilla piestocarpa var. scoparia (Rech.f. & et. al.) Parsa, Fl. Iran 10:198. 1980.

Type: Iran: " Persiae prov. Balučistan (nunc Makran): Montes Karvandar inter Khash et iranshar (Bampur), in declivibus siccis saxosis, 1500-1600 m", 16.5.1948, *Rechinger fil., Aellen & Esfandiari* 3950 (W).

Perennial, stem 40-100 cm tall, cylindrical, subglabrous, divaricately branched. leaves petiolate-narrowed at the base, sinuate pinnatisect, rarely pinnatilobed, oblanceolate-spathulate in outline, villous, sharply toothed, 5-8 (10) x 0.5 -1.5 cm; cauline leaves sessile, sagittately auriculate, auricles acuminate, subentire-sinuate dentate, acute, 3-5 x 0.5-1cm. Synflorescence laxly-racemose.Capitula erect, sub-campanulate, glabrous, 0.5-1 x 0.4 cm, c.20 florets per capitulum; peduncle longer than the capitula. Involucre phyllaries 20-25, 3-4 seriate, glabrous, scarious, stereome divided, acute; outer most 2 x 1 mm, ovate; middle ones 5-6 x 1-1.5 mm, lanceolate; innermost 8-10 x 1 mm, linear-lanceolate. Florets pink - lavender. Cypsela 3.5-4 x 1 mm, red (immature) afterwards blackened, cuneate-linear, little compressed, 8-10 narrow-ribs, muricate; beak 2-3 mm, white, slender, ± equal or smaller than the cypsela; outer pappus extremely short; inner 3-4 mm long, white.

Specimens examined: Chitral Dist.: Lutkor river, Shoghot, florets pale mauve, on rocky ledges in tufts from woody root, c.1650 m, 6.6.1958, *J.D.A. Stainton* 2590 (BM); Grotin Gol, Chitral, perennial herb, 55" in height, florets yellow, rare, near stream bank, 2660 m, 19.6.2005, *Haider Ali* 820 (KUH); Bakhtooli Gol, Lutkhoo, Chitral, perennial herb, 16" in height, florets pink, rare, near rock crevice, 1721 m, (35° 59' 00.9", , 71° 48' 34.5" 31.5.2006, *Haider Ali* 4050 (KUH); Goleen Gol, Chitral, perennial herb, 16" in height, florets light pinkish purple, infrequent, on rock crevice, 1692 m, (42-767443 E, 3982499 N), 3.6.2007, *Haider Ali* 5393 (KUH); Molikhoo, Chitral, perennial herb, 24" in height, florets purple, infrequent, on steep rocky slope, 2776 m, (42-753701 E, 3995725 N), 19.6.2007, *Haider Ali* 5922 (KUH); ibid; Quetta Dist.: Quetta valley, 1500 m, in stony ground, 27.5.1968, *Zaffar Ali* 4914 (KUH); Wali Tangi , Quetta, perennial herb, 85-95 cm tall, heads c.1.5 cm across, latex white, florets purplish blue, 23.5.1984, *S. Omer & A. Ghafoor* 1816 (KUH); Wali Tangi, Quetta, erect shrub, 40-50 cm tall, florets pink, 12.7.1988, *T.Ali & Tufail Ahmed* 1394 (KUH).

Distribution: - An Irano –Turanian element, confined to Afghanistan and Pakistan (Chitral and northern Baluchistan).

Ecology: - Grows on rocky crevices, slopes, stony areas and near stream bank ascending from 1500 – 2776 m.

Flowering period: - May-August.

11. *Cicerbita chitralensis* (Tuisl.) Roohi Bano & Qaiser **comb. nov.**

Cephalorrhynchus chitralensis Tuisl., Ann. Nat. Mus. Wien 722: 616. 1968; Rech.f., Fl. Iran. 122: 211.t.149, 202 f. 3 & 4.1977.

Type: Pakistan: Chitral, Istar to Turikho, 2100 m, *Stainton,* 2506 (W).

Perennial, stem 16-60 cm tall, erect, subglabrous, paniculately branched above. Radical leaves glabrous, narrow petiolate, runcinate pinnatifid-sectly, lobed, sharply toothed, 7-12 (15) x 0.5-2 cm, auriculate; cauline leaves sessile, lobed, acuminate. Capitula erect, subcampanulate, smooth, bracteolate, 0.8-1 x 0.5 cm, with 1-3 cm long peduncle, florets 20-22 per capitulum. Involucre phyllaries 9-15, 3-4 seriate, acute; outer ones 2-4 x 1-1.5 mm, ovate-lanceolate; inner ones 11-14 x 1 mm, linear. Florets purplish blue or pink.Cypsela up to 5 mm including beak, black, fusiform-linear, 8-14 ribbed, muricate, gradually attenuate into 1.5-2 mm long, palely distinct beak; pappus 5-6 mm long, white.

Specimens examined: Quetta Dist.: Shehla bagh hills near Chaman, Quetta, erect herb, 80 cm-1m tall, florets pink, 7.5.1985 , *A. Ghafoor & Rizwan Yusuf* 1426, 1445 (KUH); Sibi Dist.: Sasnamana forest , Ziarat, erect herb, c.45 cm tall, disc absent, 17.5.1984, *S. Omer & A. Ghafoor* 1551 (KUH).

Distribution: - A typical Irano-turanian Element, Afghanistan and Pakistan.

Ecology:-Grows in dry riverbed, and on dry slopes between 1600-2500 m.

Flowering period: - May-June.

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