

NEW SPECIES OF *TARAXACUM* WEBER EX WIGG., FROM PAKISTAN

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Abstract

A new section QAISERA and 9 new species of the genus *Taraxacum* Weber (Family Asteraceae) distributed in 5 sections viz. SECT. LEUCANTHA: 1, *T. quettacum*; sect. MACROCORNUTA: 2, *T. gilgitense*, 3, *T. laholense*; SECT. OLIGANTHA: 4, *T. mansehracum*, 5, *T. zamarrudae* SECT. QAISERA: 6, *T. qaiseri*; SECT. PARVULA: 7, *T. alii*, *T. rawalpindicum* and 9, *T. janalamii* have been described from Pakistan.

Latin diagnosis of the new taxa, discussion with closely related species and their illustrations are provided.

Introduction

The genus *Taraxacum* Weber ex Wigg., comprises 2500 species (Kirschner & Stepanek, 1994). It is mainly distributed in Europe, Central Asia, Turkey, Iran, Afghanistan, Pakistan and India, the Western Himalaya. The first monographic study appeared in 1907 (H. von Handel-Mazzetti, 1907). Then appeared many other papers on this difficult apomictic genus (Dahlstedt 1926, van Soest, 1960, 1961, 1963, 1966, 1975, 1977; Schischkin, 1964; Doll, 1973; Richard & Sell, 1976; Kirschner & Stepanek, 1987, 1994, 1996, 1997, 2006 etc). But even after so much work the genus is still problematic, rather challenging in the identification of taxa. Problems have also been created because of many new species are based on specimens without fruits while classification of the sections and species of the genus is based on fruit characters (cypselas, cones, beaks and pappus) van Soest (1961, 1975); Schischkin (1964); Richard (1972) and Richard & Sell (1975) have laid great emphasis that plants should not be collected without fruits.

While preparing an account of the genus *Taraxacum* for Flora of Pakistan the author came across several specimens which could not be matched with any known species of the genus. To accommodate these unidentified specimens 9 new species have been described. In the present paper keys to the sections and the species have not been provided which will be included in Flora of Pakistan fascicle. However relationships of the new taxa have been drawn with closely related species.

SECTION: LEUCANTHA

Leaves linear to lanceolate or subentire to lobed; petiole unwinged or narrowly winged. Involucre phyllaries appressed, smooth. Ligules white to yellow. Cypselas greyish to stramineous-brownish, spinulose above; cone gradually formed or rarely abrupt; beak 5-7 mm long; pappus equal to beak, usually white.

1. *Taraxacum quettacum* S. Abedin sp. nov. (Fig. 5b, b₁)

Radix sat tenues. Herba 7-8 cm longa. Petiolo 3-5 cm longo, brunneo; breveo angustato; labila 4-6 x 1-2 cm, glabra, pinnatisecta, utrinsecus 5-8-lobata, lobi laterales triangulares, retroverso-denticulati, interlobis 3-5 mm latis, denticulate. Scapi 4-5, folia aequantes, glabrae. Involucrum 15-17 x 10 mm, atro-viridum squamae exteriores appressae, 3-5 x 1-2 mm, lanceolatae, emarginatae, callosae; squamae interiores late lineares, 15-17 x 2 mm capitulum c. 2 cm diam; ligulae luteae. Antherae polliniferae. Styli et stigmata dilute brunnea. Cypsela 4-4.5 mm longa, straminea ad brunnea, superene spinulosa, basi rugulosa, costata; pyramidem cylindricam 1.5-1.8 mm longam, sensim ad subabrupte abiens, spinulis interdum praeditam; rostrum c. 9 mm longum; pappus 6-7 mm longus, albus ad niveus.

HOLOTYPUS: Pakistan: Quetta Distt.: Surey Range, Spin Karez, heads yellow, 1.5.1985, *Abdul Ghafoor & Rizwan Yusuf* 1040 (KUH).

Roots thin, collar with few brown flexuous hairs in the leaf axils. Herb, 7-8 cm tall. Petiole 3-5 cm long, brown, very narrowly winged at the base, appearing almost unwinged; blades 4-6 x 1-2 cm, glabrous, pinnatisect; lobes 5-8 on each side, triangular, denticulate, runcinate; interlobe 3-5 mm broad, denticulate; terminal, lobe small. Scapes 4-5, as long as leaves, almost glabrous. Capitulum c. 2 cm across. Involucre 15-17 x 10 mm, dark-green; outer phyllaries ± appressed, 3-5 x 1-2 mm, linear-lanceolate to ovate, emarginate, callose; inner ones broadly linear, marginate, callose or smooth, 15-17 x 2 mm, very long as compared to the outer ones. Ligules yellow, peripheral ones with dark stripes outside. Anthers polleniferous. Styles and stigmas brownish. Cypselas stramineous to brown, 4-4.5 mm long, spinulose at top, rugulose below, ribbed; cone cylindrical, 1.5-1.8 mm long, almost gradually formed, with or without spinules; beak c. 9 mm long; pappus 6-7 mm long, scabrous, white to snowy white.

D-4: Pakistan: Quetta Distt.: Surey Range, Spin Karez, heads yellow, 1.5.1985, *Abdul ghafoor & Rizwan Yusuf* 1040 (KUH); **D-5:** ibid, Quetta Distt.: Loralai to Harnai, Torkhan Pass, Top of Pass, 1900 m, 14.5.1965, *Jennifer Lamond* 1241 (E).

Distribution: Endemic to Pakistan.

The narrow leaves with 5-8 lobes on each side, outer phyllaries emarginate, cypselas with gradually formed cones, capillary beaks and white pappus suggest that the *Taraxacum quettacum* S. Abedin belongs to the section *Leucantha* Soest. The new species shows some resemblance with *T. ladakense* in the shape of leaves, but the former has dentate lobes and the latter has entire lobes. The most peculiar feature of the present taxon is the length of phyllaries. The inner phyllaries are 3-4 times longer than the outer ones. The length of cypselas body, cone, beak and pappus are also distinct and longer than *T. ladakense*.



Fig. 1. *Taraxacum laholense* S. Abedin: a, habit; a1, cypsel. *Taraxacum gilgitense* S. Abedin: b, habit; b1, cypsel.

SECTION: MACROCORNUTA

Leaves with unwinged or narrowly winged petioles. Involucre phyllaries usually loosely appressed to arcuate-recurved, corniculate to cornute. Cypselas spinulose above; cone abruptly formed; beak 6-12 mm long; pappus 5-7 mm long, white to snowy white.

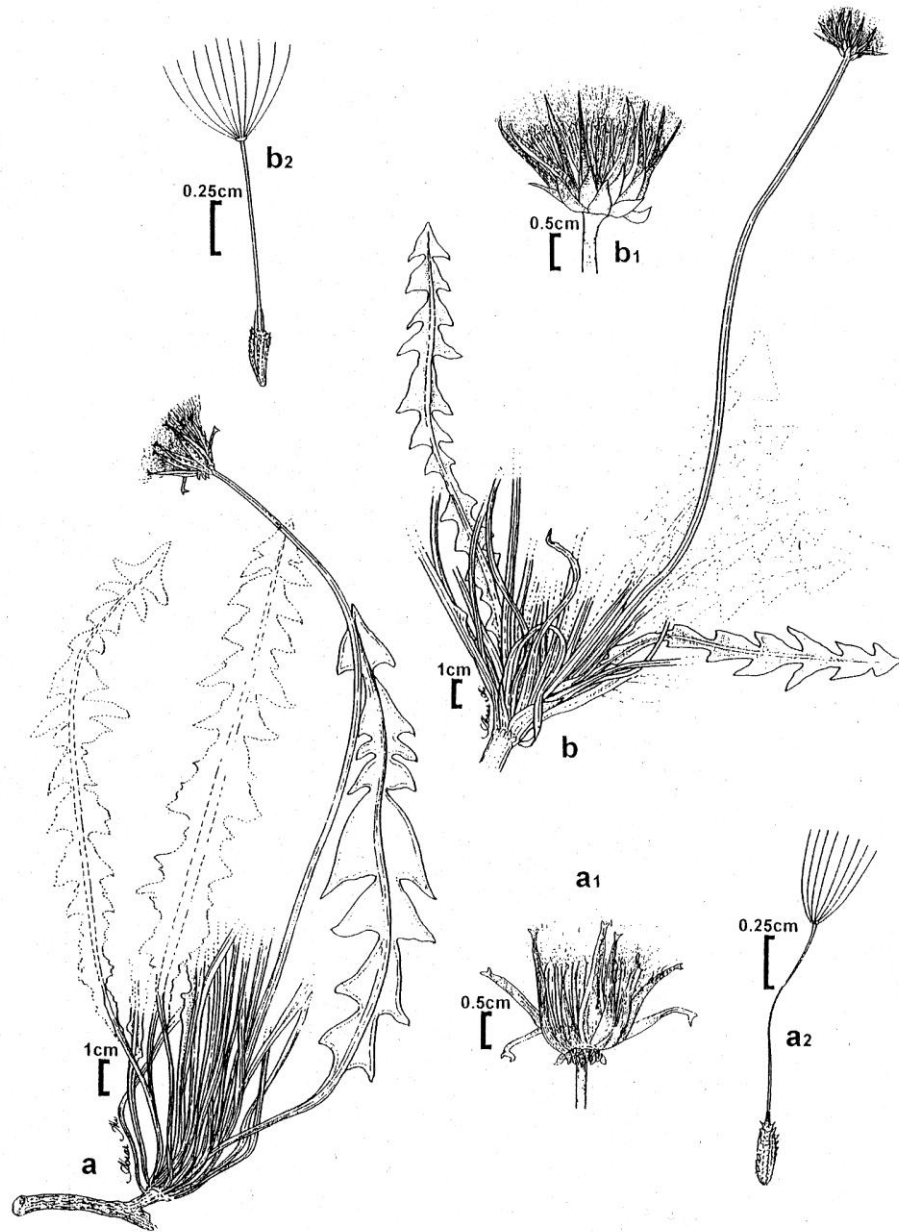


Fig. 2. *Taraxacum alii* S. Abedin: a, habit; a1, capitulum; a2, cypsela. *Taraxacum janalamii* S. Abedin: b, habit; b1, capitulum; b2, cypsela.

2. *Taraxacum gilgitense* S. Abedin sp. nov. (Fig. 1, b, b₁)

Planta c. 20-25 cm alta. Folia 10-18 x 1-3 cm, glabra, viridia, pinnatisecta, loba runcinata et patenta, vulgo integra, utrinque 5-7, interlobus integer vel denticulatus, lobus

terminalis brevis; petiolis viridis, angustis alatis, glabris. Scapi c. 15, 15-20 cm longi, singularis monocapitulum sessilis, subinvolucra densis araneosi. Capitulum 1.5-2 cm diametro. Involucrum 12 x 12 mm; phylla exteriora viridia, appressa, marginata, \pm corniculata vel cornuta, 4-6 x 1.5-2 mm, linearia-lanceolata, glabra; interiora viridia, linearis, marginatae, corniculatae vel cornuta. Ligulae lutea, extus atrostriatae. Antherae polliniferae. Stylus et stigmata lutea. Cypsela viridula, c. 3 mm longa, superne arguta spinulosa, ceterum rugosa; pyramidem c. 1.2 mm longam, cylindricam, \pm abrupte abiens; rostrum 6-8 mm longam; pappus c. 5 mm longus, niveus scaberulus.

HOLOTYPE: Pakistan: Distt. Gilgit: Hunza, Ghaimash, Karimabad, *Jan Alam* 1705 (KUH).

Perennial, c. 20-25 cm tall herb. Leaves 10-18 x 1-3 cm, glabrous, green, lobes narrow acute, 1-1.5 cm long, usually entire, some denticulate; interlobes entire and denticulate, 4-6 mm broad; terminal lobe small or somewhat elongated; petiole green, narrowly winged at base, glabrous. Scapes c. 15, 15-20 cm long, with dense, white, flexuous hairs below the capitulum, one capitulum sessile. Capitulum 1.5-2 cm across. Involucre 12 x 12 mm; outer phyllaries green, with white scarious margin, corniculate or cornute, 4-6 x 1.5-2 mm, appressed, linear-lanceolate, glabrous; inner ones green, linear, marginate, corniculate or cornute or a few without appendages. Ligules yellow, peripheral ones with dark stripes outside. Anthers polleniferous. Pollens irregular. Styles and stigmas yellow. Cypselas greenish, c. 3 mm long, with sharp spinules in the upper half, rugose below, many ribbed, fusiform or some slightly flattened above; cone c. 1.2 mm long, cylindrical, \pm abrupt; beak 6-8 mm long; pappus c. 5 mm long, snowy white, scabrous.

A-8: Pakistan: Distt. Gilgit: Hunza, Ghaimash, Karimabad, weed in steep-beds of potato field, perennial herb, heads yellow, \pm 2300 m, common, 9.6.2003, *Jan Alam* 1705 (KUH).

Distribution: Known from type locality.

The present taxon belongs to the section *Macrocornuta* Soest because of corniculate and cornute phyllaries, long cone and snowy-white pappus.

Apparently it resembles *Taraxacum multiscaposum* Schischk., in having similar cypselas, their cones, beaks, pappus and to some extent in the number of scapes. But well differentiated in having outer phyllaries smooth and recurved, inner phyllaries ecorniculate and brownish cypselas. The present taxon is characterized by having densely rosulate leaves, more than 40, 15-20 cm long, scapes, c. 15 in numbers including one sessile head, both phyllaries corniculate or cornute, some without appendages and outer ones appressed. It is of interest to note that the present taxon occurs in the northern part of Pakistan close to China border and further north c. 400 km lies Tian Shan mountains of China from where *Taraxacum multiscaposum* Schischk., was reported. It also resembles *Taraxacum wallichii* DC. and *Taraxacum pseudo-wallichii* Soest on the basis of numerous scapes. Though the number of scapes is not known but it differs by having dark coloured leaves and scapes, stramineous or orangish-reddish cypselas. There is one specimen at K, identified by Kirschner as *T. wallichii*, has 6-7 scapes. I have seen its

photograph at PRA. In the present taxon the leaves are green, scapes greenish, and cypselas are also greenish. The leaf lobes in *T. wallichii* and *T. pseudowallichii* are densely dentate or denticulate while in the present taxon they are entire.

3. *Taraxacum laholense* S. Abedin sp.nov. (Fig. 1a, a₁)

Planta c. 15 cm alta. Folia 15 x 1-2 cm, pinnatisecta, multicellularis araneosa, densi basi inclusa petiola, lobi lateralis utrinque 5-9, ± patentes, interlobia, angusta, c. 2 mm lata. Scapi 3 inclusus unus sessilis, c. 3 mm crassi. Calanthium 2.5-3 cm diametro. Involucrum c. 12 x 12 mm; phylla exteriora viridia-roselia, recurvata, linearia-lanceolata, marginata, laevis, interiora linearia. Ligulae flavae, marginata extus stria atrae notata. Antherae polliniferae. Stigmata nigra vel subnigra. Cypselas 4-5 mm longa, straminea; pyramidem 1.5-2 mm longam, subcylindricam, subabrupte abiens; rostrum 10-12 mm longum; pappus c. 7 mm longus, albus ad sordide albus, scaberulus.

HOLOTYPE: India: Western Himalaya Province Lahol, left shore of the Bhaga (later Tsinab) at Kardong, 14.6.1856, *Schlagintweit* 4047 (BM!).

A small, c. 15 cm tall herb. Leaves 15 x 1-2 cm, pinnatisect, multicellular hairy, densely at the base including narrowly winged petioles, lobes 5-9 on each side, patent or so, interlobe narrow, c. 2 mm broad. Scapes 3 including one sessile, the others as long as leaves, c. 3 mm thick, hairy above. Capitula 2.5-3 cm across. Involucre c. 12 mm long and broad; outer phyllaries greenish-pink, appressed in flowering, recurved or so in fruiting, linear-lanceolate, marginate, smooth; inner ones linear, marginate, smooth, slightly dark green. Ligules yellow, peripheral ones with dark streaks outside. Anthers polleniferous. Stigmas drying black. Cypselas 4-5 mm long, stramineous, densely sharp and blunt spinulose above, looking somewhat 4-angled above, many ribbed; cone gradual or so, 1.5-2 mm long, glabrous; beaks equal, 10-12 mm long; pappus c. 7 mm long, white to creamish, scabrous.

Distribution: India, known only from type locality.

The specimen was identified as *T. officinale* Wigg. Later Handel-Mazzetti (1909) identified as *T. indicum* mh. There is a note on sheet by van Soest (1962) "this is the only specimen of the type I know and a remarkable plant. Probably section Indica v.S.? Leaves very hairy, interesting shape of achenes, new species? Material too incomplete for description. Pappus brownish. Different from Strachy & Winterbottom form!" Doll (1986) put a sign "!". He has seen the specimen but without remark.

van Soest (1962) has described many species based on incomplete (without fruits) specimens. But the present specimen which is complete in vegetative, flowering and fruiting characters, his remark "too incomplete" is rather surprising.

The present taxon is included in the section *Macrocornuta* because of long cones of cypselas. It is very conspicuous species of this section having stramineous cypselas 4-5 mm long; cones 1.5-2 mm long; and beaks 10-12 mm long. Leaves densely multicellular hairy at base including narrowly winged or almost totally unwinged petioles. The stigmas are blackish. The pappus is creamish rather than brownish as remarked by van Soest. It is a very distinct species and has no relatives in or outside Pakistan.

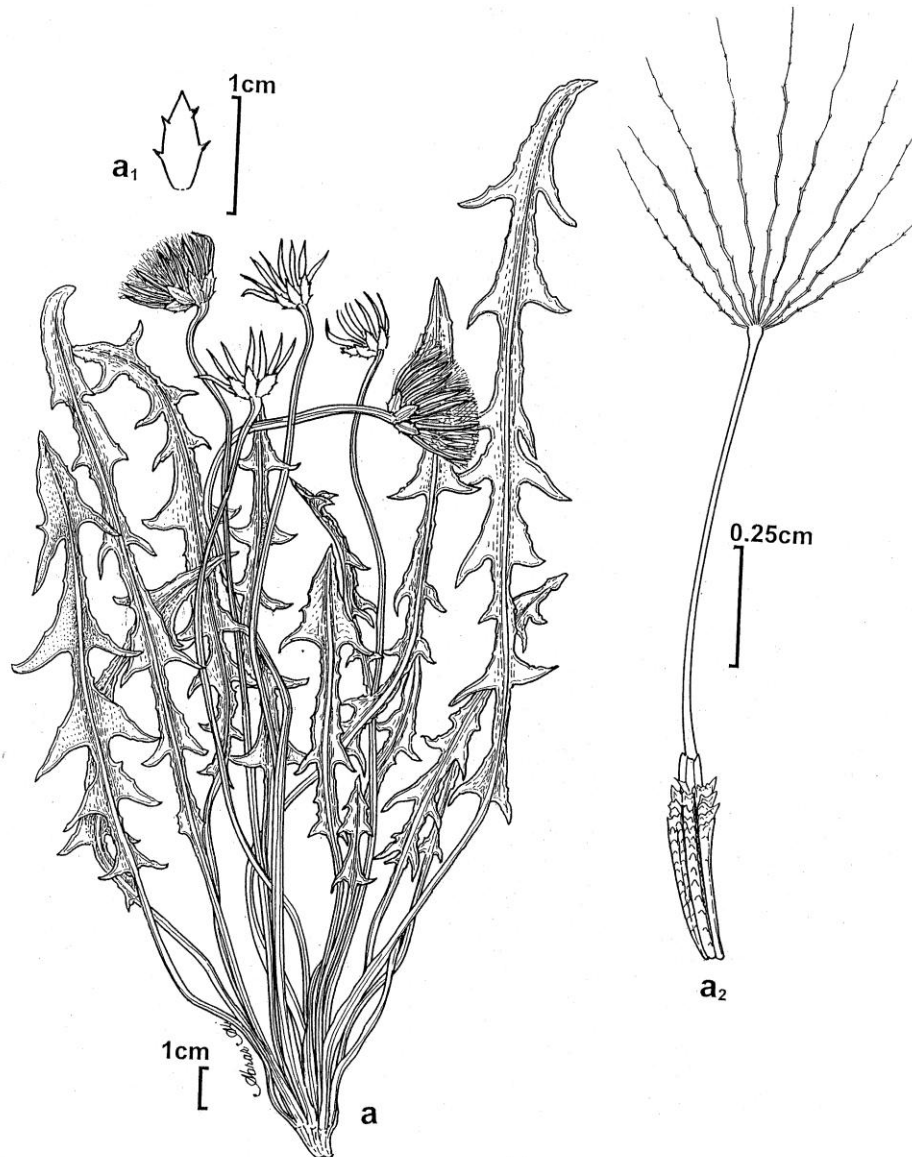


Fig. 3. *Taraxacum qaiseri* S. Abedin: a, habit; a1, outer phyllary; a2, cypsel.

SECTION: OLIGANTHA

Leaves with unwinged or narrowly winged petioles, rarely widely winged. Involucre phyllaries appressed, usually smooth. Ligules yellow. Styles and stigmas yellow. Cypselas greyish to straw brown; cone gradually formed; beak thick, 1-3 mm long or absent; pappus 4-8 mm long, white to snowy white or brownish.

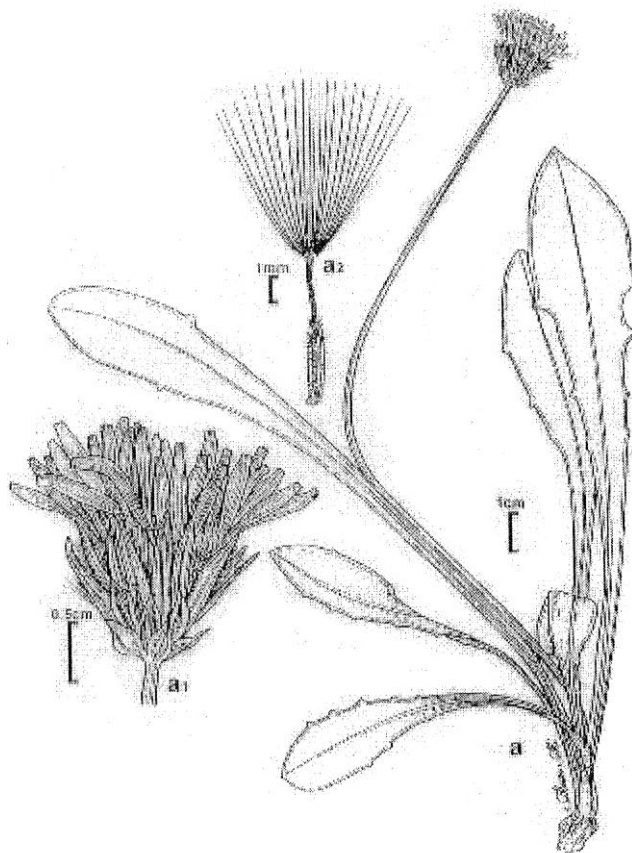


Fig. 4. *Taraxacum mansehracum* S. Abedin: a, habit; a1, capitulum; a2, cypsel.

4. *Taraxacum mansehracum* S. Abedin sp. nov. (Fig. 4a, a1, a2)

Herba gracilis, 15-20 cm alta, in axillis tomentula fuscescens et pilis flexuosis longis. Folia unguiculata – oblanceolata, obtusa, integra vel paulo dentata, 7-18 x 2-3 cm petiolo incluso, papyracea, omnino glabra. Scapus viridus glaber. Capitulum c. 2 cm diametro. Involucrum 10-12 mm longum et latum viridum, squamae exteriores adpressae, ovatae, 3-4 x 2.5-3 mm, late marginatae, omnes laeves. Ligulae luteae, extus stria pallide notatae. Antherae vacuae. Stylus et stigmata subnigra. Cypsel c. 3 mm longa, brunnea, superne paulo spinulosa et papillosa; pyrimidem \pm 1 mm longam, sensim abiens, basin papillosa; rostrum 2-3 mm longum, crassum, costatus; pappus c. 8 mm longus, albus.

HOLOTYPE: Pakistan: Mansehra Distt., Dunga Gully, 22.5.1981, *Y. Nasir & Khan* 9562 (KUH).

A slender, 15-20 cm tall herb with brown, flexuous hairs in the leaf axils. Leaves oblanceolate, tongue-shaped, obtuse, entire or denticulate, 7-18 x 2-3 cm including basally winged, papery, glabrous petioles. Scape solitary, green, glabrous, as long as or little longer than leaves. Capitulum 2 cm across. Involucre 10-12 mm long and broad;

outer phyllaries brownish-green, broad ovate, acuminate, broadly brownish marginate, ecoriunculate, somewhat denticulate, 3-4 x 2.5-3 mm; ligules yellow; peripheral ones with light grey stripes. Anthers epolleniferous. Stigmas dark brown to blackish, coiled into 1 or 2 rings, included. Cypselas c. 3 mm long, brownish, with few spinules and long papillae (0.3-0.5 mm) above; cone conical-cylindrical, c. 1 mm long, gradual, usually with long papillae at base; beak 2-3 mm long, thick, somewhat stout, ribbed; pappus c. 8 mm long, dull-white.

Distribution: Endemic to the northern region of Pakistan.

The cypselas with few spinules, gradually formed cones, and thick, somewhat stout and small beaks are peculiar characters of the section *Oligantha* Soest. It is thus reasonable to accommodate the present taxon comfortably in the section *Oligantha* Soest. The one very unique character has been noticed in the present taxon that cypselas at tops and their cones at bases are long papillose. It can easily be recognized with this character alone. It is as the same as in *T. nagaricum* Soest in section *Tibetana* Soest which can be identified by a single character that the cypselas are broad-spinulose at top, and similarly *T. amblylepidocarpum* Soest of section *Orientalia* Hand.-Mazz. with cypselas bearing a remarkable character blunt scaly spinules above. The present taxon resembles *T. zamarrudae* S. Abedin in somewhat entire leaves and epolleniferous anthers. But it differs in many other characters. The latter taxon has the outer longest phyllaries as long as the inner ones and moreover all phyllaries black. In the present taxon the inner phyllaries are much longer than the outer longest ones, and all phyllaries are brownish green. Apparently the present taxon does not have any resemblance with any species not only of the section *Oligantha* but also of other sections.

5. *Taraxacum zamarrudae* S. Abedin sp. nov. (Fig. 6a, a₁, a₂)

Planta gracilis, 8-10 cm alta, inferne subglabra. Folia flavovirentia, 6-8 x 0.5-1.5 cm; folia exteriora anguste lanceolata vel lingulata, integra vel breviter dentate, interiora utrensica 3-5 breviter retrorversi lobata; lobio terminali majore, late lanceolata, c. 2 cm longis; petiolo pallido lato; 2-3 cm longo. Scapi 2-3, foliis subaequilongi, brunneum araneosi subcapitulum. Capitulum 2-2.5 cm diametro. Involucrum 10-13 x 8-10 mm, atroviridum; squamae exteriores appressae, paucae, 7-10 x 3 mm, late-lanceolatae, extus pubescentes, ecoriuncolatae, interiores lineares-lanceolatae, cornu vel ecoriuncolatae; ligulae laete luteae, extus atrostriatae. Antherae vacuae. Styli et stigmata fuscescentia ad subnigra. Cypselas stramineus ad brunnea, 3.5-4 mm longa, superne paulo tuberculata, costata; pyramidem \pm 0.5 mm longam, sensim abiens; rostrum 2-4 mm longum, costatum, \pm crassum; pappus c. 7 mm longus, scaberulatus, sordidus.

HOLOTYPE: Pakistan: Gilgit Dist.: Khunjerab, Hunza, 4750 m, 31.8.1988, *Y. Nasir & Ali Gohar* 13436 (KUH).

Small, 8-10 cm tall, slender, glabrous herb, root collar with few, brown, flexuous hairs. Leaves yellowish-green, 6-8 x 0.5-1.5 cm; outer ones narrowly lanceolate to lingulate, entire or with small teeth; inner ones with small 3-5 lobes on each side; terminal lobe broad lanceolate, c. 2 cm long; petiole 2-3 cm long, very widely winged at base, brown. Scapes 2-3, with brown hairs below the capitulum. Capitulum 2-2.5 cm across. Involucre 10-13 x 8-10 mm, dark green to black when dry; outer phyllaries few,

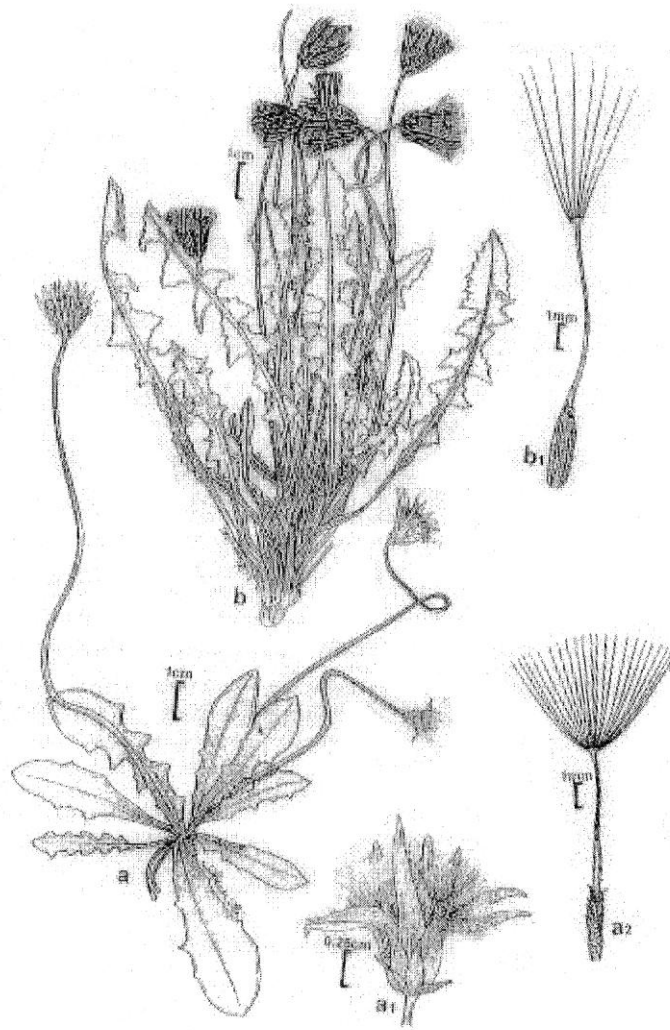


Fig. 5. *Taraxacum rawalpindicum* S. Abedin: a, habit; a1, capitulum, a2, cypsela. *Taraxacum quettacum* S. Abedin: b, habit; b1 cypsela.

appressed, 7-10 x 3 mm, the longest nearly as long as or little smaller than the inner ones giving the appearance as the inner ones unequally 2-seriate, broadly lanceolate, with or without scarious margin, nearly eorniculate, hairy outside; inner ones linear lanceolate, corniculate or eorniculate, hairy outside. Ligules bright yellow; peripheral ones with dark stripes outside. Anthers epolleniferous. Styles and stigmas drying dark-brown to blackish. Cypselas fusiform, stramineus to brown, 3.5-4 mm long, with few tubercles above, smooth below or somewhat rugulose, ribbed, cone \pm 0.5 mm long, gradually formed, conical; beak 2-4 mm long, ribbed, stout, blackish, thicker at top and base – an unusual character; pappus c. 7 mm long, scabrous, creamish.

Distribution: Known from type gathering.

The presence of few spinules of cypsela, short and stout beak and gradually formed cone rightly suggests to place this taxon in the section *Oligantha* Soest. However, the black phyllaries and stigma are in support of the section *Tibetana* Soest. But the structure of cone and stout beak are not the characters of the sect. *Tibetana*. So far *T. amabile* Soest, *T. brevirostre* Hand.-Mazz., *T. iranicum* Soest and *T. oliganthum* Schott & Ky. ex Hand.-Mazz. are known in the Sect. *Oligantha*. But only *T. brevirostre* is reported from Pakistan. There are, however, few characters in the present taxon not common in any section viz. (1) the longest outer phyllaries are almost equal to the inner phyllaries – giving the appearance as somewhat unequally 2-seriate inner phyllaries; and (2) the beak of cypsela is apically and basally thick. These two characters may suggest to form a separate section close to *Oligantha*. As there is only a single sheet, though with three independent specimens, it is not reasonable to form a new section. More material is needed for final decision. It also differs from all the species except *T. mansehracum* of this section by having somewhat entire leaves and epolleniferous anthers. (see discussion under *T. mansehracum* S. Abedin).

The name is given after Miss Zamarrud, student of Ph.D. in Botany Department (Taxonomy) at the University of Karachi.

SECTION: QAISERA S. Abedin sect. nov.

Plantae gracilis. Folia glabra caerulea virentia, pinnatipartita, loba runcinata, integra. Scapi numerosi, unequal. Involucrum phylla exteriora \pm reflexa, reticulata, ovato-lanceolata, paucidentata, ecorniculata; interiora linearis, atroviola. Ligulae luteae. Antherae polleniferae. Stylus et stigmata siccitate nigra. Cypsela pallida brunnea flava, supreme brevis \pm obtuse spinulosa; pyramidem 0.6-0.8 mm longam, abrupte abiens, conicam; rostrum 7-8 mm longum; pappus 6-7 mm longus, niveus, scaberulus.

Typus sectionis: *Taraxacum qaiseri* S. Abedin

Plants small, slender. Leaves glabrous, bluish-green; lobes runcinate, entire. Scapes unequal. Involucre outer phyllaries \pm reflexed, reticulate, scarious, lanceolate-ovate, slightly toothed, ecorniculate; inner ones linear, dark green. Ligules yellow. Pollens present. Styles and stigmas drying black. Cypselas brown to dull yellow with small, blunt spinules above, rugose below, smooth at the base; cone 0.6-0.8 mm long, abruptly formed, conical; beak 7-8 mm long; pappus 6-7 mm long.

The new section though resembles the Sect. *Mongolica* in having reticulately veined outer phyllaries but the unique character that outer phyllaries are toothed needs the formation of new Sect. *Qaisera*.

6. *Taraxacum qaiseri* S. Abedin sp. nov. (Fig. 3a, a₁, a₂)

Planta c. 15 cm alta. Folia 10-20 x 1-2 cm, glabra caerulea-virentia, pinnatipartita, loba runcinata, longa, anguste, vulgo integra, utrinque 4-7, lobus terminalis c. 3 x 1 cm;

petiolis 4-6 cm longis, purpureis, basi angustis alatis, glabris. Scapi 9 (5 longi, foliis \pm aequilongis; 4 brevis, 0-3 cm longi). Capitulum c. 3 cm diametro. Involucrum c. 15 x 15 mm; phylla exteriora \pm reflexa, reticulata, 3-12 x 2-4 mm, ovata ad lanceolata, fulva ad rosellia, ecorbiculata, paucidentata, scariosa et nervo mediano atrovirido; interiora linearis, atrovirida, anguste marginata. Ligulae luteae, extus atrostriatae. Antherae polleniferae. Stylus et stigmata siccitate nigra. Cypsela pallide brunnea-flava, c. 3.5-4 mm longa, superne brevis \pm obtuse spinulosum, ceterum rugosa, basi laevis; pyramidem 0.6-0.8 mm longam, conicam, abrupte abiens; rostrum 7-8 mm longum; pappus 6-7 mm longus, niveus scaberulus.

HOLOTYPUS: Pakistan: Distt. Gilgit: Taterkachi, Khaltarow, Haramosh, common, 3500 m, 2.8.2003, *Sherwali Khan & Shabbir Hussain* 397 (KUH).

Perennial herb, c. 15 cm tall. Leaves 10-20 x 1-2 cm, glabrous, bluish-green, pinnatipartite, lobes runcinate, long, narrow, usually entire, 4-7 on each side, terminal lobe 3 x 1 cm, longer than laterals; petiole 4-6 cm long, purple, narrowly winged at base, glabrous. Scapes 9, 5 as long as leaves, the others 0-3 cm long. Capitulum c. 3 cm across. Involucre 15 x 15 mm, outer phyllaries \pm recurved, reticulate, 3-12 x 2-4 mm, lanceolate to ovate, dull-yellow to pink with purple tips, ecorbiculate, few slightly toothed, scarious and with purple midvein; inner ones linear, dark-green, narrowly marginate. Ligules yellow, peripheral ones with dark stripes outside. Anthers polleniferous. Styles and stigmas drying black. Cypselas brownish to dull-yellow, 3.5-4 mm long, with small blunt spinules above, rugose below, smooth at base; cone 0.6-0.8 mm long, conical, abrupt; beak 7-8 mm long; pappus 6-7 mm long, snowy-white, scabrous.

A-7: Gilgit Distt.: Taterkachi, Khaltarow, Haramosh, small perennial herb, 15 cm tall, heads yellow, dry place, common, 3500 m, 2.8.2003, *Sherwali Khan & Shabbir Hussain* 397 (KUH).

Distribution: Endemic to Pakistan.

The present taxon is characterized by having scarious, reticulately veined and toothed outer phyllaries and shows the resemblance with the section *Mongolica* Dahlst. It is close to *Taraxacum vassilczenkoi* Schischk. of this section in almost glabrous leaf axils, usually ecorbiculate phyllaries, in the length of cypselas and their cones and hairy scapes just below capitula. Also close in the area of distribution. The *Taraxacum qaiseri* occurs in Gilgit, north of Pakistan, close to China border. In the further north, about 300-350 km, crossing the Hindukush mountains lies Pamir mountains sharing Tajikistan in the west and China in the east from where *Taraxacum vassilczenkoi* Schischk has been reported. But differs in many respects. *Taraxacum qaiseri* S. Abedin is c. 15 cm tall with 4-7 lobes on each side of leaves, has glabrous, toothed, recurved, long outer phyllaries and cypselas 3.5-4 mm long with both sharp and 2-3-toothed blunt spinules. *Taraxacum vassilczenkoi* Schischk. is 2.5-8 cm tall with few leaf lobes, has outer phyllaries somewhat hairy margin on the upper side, entire and appressed, and cypselas 2.5-3 mm long with acute/ sharp spinules.

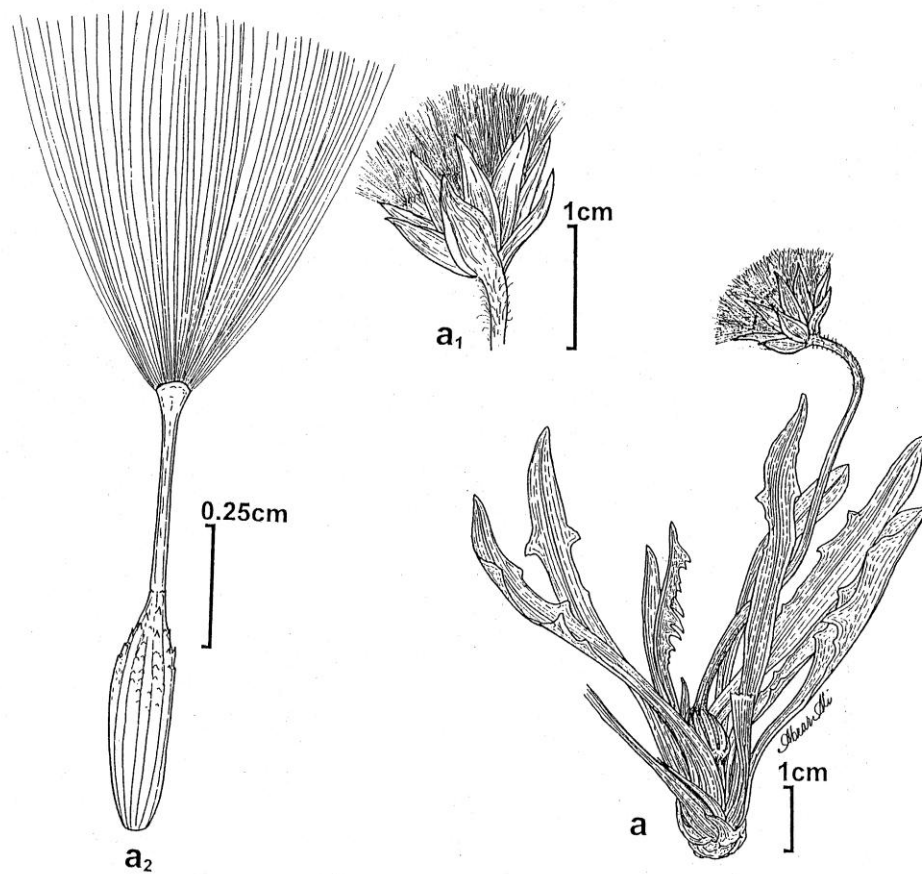


Fig. 6. *Taraxacum zamarrudae* S. Abedin: a, habit; a1, capitulum; a2, cypselus.

The name is given in the honour of Dr. Mohammad Qaiser, a retired Professor of Botany. He is one of the editors of Flora of Pakistan. His contributions to the Flora of Pakistan and Libya are outstanding.

SECTION: PARVULA

Leaves usually with broadly winged petioles. Involucre phyllaries appressed or rarely curved, smooth to callose or rarely cornute and corniculate. Cypselas sparsely spinules above; cone usually gradually formed; beak 6-8 mm long; pappus 5-7 mm long, white.

7. *Taraxacum alii* S. Abedin sp.nov. (Fig. 2a, a1, a2)

Planta c. 30 cm alta. Folia 12-20 cm alta petioli inclusa, 2-3 cm lata, atrovirida pinnatilobata, loba runcinata ad patentissima, vulgo integra, utrinque 7-9; peitulus glaber anguste alatus, 5-8 cm longis. Scapi 14, c. 30 cm longi, glabri, 1-2 mm lati, subinvolucra

paulo araneosa. Capitulum c. 3 cm latum. Involucrum 2 x 2 cm; phylla exteriora reticulata, 4-7 x 1.5-3 mm, linearis-lanceolatae ad lanceolatae, rosellia, corniculata, reflexa, scariosa; interiora virida ad \pm atroviriata, linearia, anguste marginata, corniculata ad cornuta. Ligulae luteae, extus atrostriatae. Antherae polliniferae. Stylus et stigmata testaceus. Cypsela pallida brunnea, 3.5-4 mm longa, superne breve \pm obtusus spinulae, ceterum rugosae; pyrimidem c. 1 mm longam, \pm cylindricam, abrupte abiens; rostrum 10-13 mm longum; pappus 6 mm longus, albus, scaberulus.

HOLOTYPUS: Pakistan: Campbellpur Distt.: Kala Chita Range, in shade, near a stream, 30.3.1963, *Nasir & Siddiqui* 1634 (KUH).

Perennial herb, c. 30 cm tall. Leaves 12-20 cm long including petiole, 2-3 cm broad, dark-green, pinnatilobate, lobes runcinate and patent, usually entire, 7-9 on each side; petiole glabrescent, 5-8 cm long, winged. Scapes 14, c. 30 cm long, glabrous, 1-2 mm thick, sparsely flexuous hairy above. Capitulum c. 3 cm across. Involucre 2 x 2 cm; outer phyllaries reticulate, 4-7 x 1.5-3 mm, linear-lanceolate to lanceolate, pink, corniculate, recurved, scarious; inner phyllaries green to dark-green, linear, narrowly marginate, corniculate to cornute. Ligules yellow, peripheral ones with dark stripes outside. Anthers polleniferous. Styles and stigmas brownish-yellow. Cypselas brownish, 3.5-4 mm long with small, blunt spinules above, rugose below; cone c. 1 mm long, cylindrical, abruptly formed; beak 10-13 mm long; pappus 6 mm long, white, scabrous.

C-7: Distt. Campbellpur: Kala Chita Range, in shade near a stream, 600 m, 30.3.1963, *E. Nasir & M. A. Siddiqui* 1634 (KUH). van Soest (1964) identified it as *Taraxacum wallichii* DC.

Distribution: Endemic to Pakistan.

The present taxon with cornute outer phyllaries and corniculate inner ones, and abruptly formed, c. 1 mm long cones of the cypselas suggest it to accommodate in the section Parvula. The specimen on which the present taxon is based has been identified by van Soest (1964) as *Taraxacum wallichii* DC. He has not cited this specimen in his work, Fl. Iran. 122: 258. 1977 for certain reason pointed out at the end of the description.

However, the present taxon differs from *Taraxacum wallichii* DC. in many respects viz. the colour of petioles, shape of leaves and length of cypselas, their cones and beaks etc.

The two new species viz. *Taraxacum alii* S. Abedin and *T. janalamii* S. Abedin are apparently very similar in the shape, size and colour of leaves, in the length and colour of scapes, size and colour of involucre. However, the former is characterized by having both outer and inner phyllaries corniculate and the outer ones recurved, 1-2 mm thick scapes, 10-13 mm long beaks and narrowly winged petioles. The latter is characterized by having both phyllaries ecorniculate and the outer ones appressed, 1.5-4 mm thick scapes, 8-10 mm long beaks and broadly winged petioles.

The name is given in the honour of my teacher Professor Dr. S. I. Ali, former Vice-Chancellor of the University of Karachi, and one of the editors of Flora of Pakistan. He has also been editor of Flora of Libya – a world renowned phytotaxonomist.

8. *Taraxacum rawalpindicum* S. Abedin sp.nov. (Fig. 5a, a₁, a₂)

Planta 10-20 cm alta. Folia glabra, 3-5 x 0.5-1.5 cm, obtusa, integra vel sinuato-lobata vel pinnatipartita, utrensens 3-4-lobata; petiolis non alatis. Scapi 3, glabri, 10-15 cm longi. Calathium c. 1.5 cm diametro. Involucrum 10 x 6 mm, phylla exteriora 7-8, lanceolata, appressa, omnes laeves; interiora 7-8, linearia, c. 2-3-plo longiora, viridia. Ligulae luteae. Antherae polleniferae. Stylus et stigmata sordide lutea. Cypsela 3 mm longa, dilute brunnea, superne spinulosa; pyramidem sub-cylindricum, 1.5-2 mm longum, sensim abiens; rostrum 3-4 mm longum; pappus c. 5 mm longus, barbellatus, albus.

HOLOTYPE: Distt. Rawalpindi: Bharatian, above stream, 2.5.1977, E. & Y. Nasir 8327 (KUH).

A small, 10-20 cm tall herb with glabrous leaf axils. Leaves glabrous, 3-5 x 0.5-1.5 cm, entire to little sinuately lobed, obtuse, few leaves pinnatilobed; petioles 0-2 cm long, unwinged. Scapes 3, very thin, slender, 10-15 cm long, completely glabrous. Capitula c. 1.5 cm across. Involucre narrow, 10 x 6 mm, glabrous, smooth, brownish-green; outer phyllaries 7-8, lanceolate, appressed, emarginate; inner ones 7-8, linear, 2-3-times longer than outer. Ligules c. 15, yellow. Anthers polleniferous. Styles and stigmas yellowish-brown or dull yellow. Cypselas c. 3 mm long, fusiform, attenuate on both sides, spinulose above, rugose at the base, brownish; cone somewhat cylindrical, 1.5-2 mm long, gradually formed; beak 3-4 mm long; pappus c. 5 mm long, barbellate, white.

Distribution: Known from type locality.

The regularly formed cones of cypselas, thin beaks, white pappus and emarginate outer phyllaries are sufficient characters to support to place the new taxon in the section *Parvula*.

Of all the species of this section known from Pakistan, the present species has resemblance with *Taraxacum parvulum* DC., in the length of cypselas, cones, beaks and pappus. However, characters such as thin, slender, glabrous, 2-3-times longer scapes than leaves; small capitula with lesser numbers of emarginate phyllaries and ligules, and more conspicuously barbellate pappus are collectively very different from the rest of the species of this section. I have studied more than 500 specimens of *Taraxacum* which bear usually scabrous pappus and less commonly capillaceous. *Taraxacum rawalpindicum* S. Abedin is the only species which bears barbellate pappus. This terminology has been adapted from P. H. Davis & A. J. C. Grierson in P. H. Davis, Fl. Turk. 5: 6. 1975. The obtuse leaves resemble *Wendelboa obtuse* Soest.

9. *Taraxacum janalamii* S. Abedin sp.nov. (Fig. 2b, b₁, b₂)

Planta c. 30 cm alta. Folia 10-15 cm alta petiolo incluso, 2-3 cm lata, atrovirida, glabra, pinnatiloba, loba runcinata, integra, lata, utrinque 6-9; petiolis latis alatis, siccitate atropurpureis, 3-6 cm longis. Scapi 14, 25-30 cm longi, glaberi, crassus, 1-4 mm lati. Capitulum c. 3 cm latum. Involucrum \pm 2 x 2 cm; phylla exteriora reticulata, 6-10 x 2-3 mm lanceolata appressa, pallida ad atrovirida, laevia; interiora virida, linearia, anguste

marginata, callosa. Ligulae luteae, extus atrostriatae. Antherae polleniferae. Stylus et stigmata sordide lutea. Cypsela c. 3 mm longa, brunnea, superne argute spinulosa ceterum rugosum; pyrimidem c. 0.7-1 mm longam, conico-cylindricam, sub-abrupte abiens; rostrum 8-10 mm longum; pappus 5-6 mm longus, albus, scaberulus.

HOLOTYPUS: Distt. Gilgit: Ghamesar, Hunza, 2.6.2002 *Jan Alam* 647 (KUH).

Perennial herb, c. 30 cm tall. Leaves 10-15 cm long including petiole, 2-3 cm broad, dark-green, glabrous, pinnatilobed, lobes runcinate, entire, broad, 6-9 on each side; petiole broadly-winged, dark-purple, 4-6 cm long. Scapes 14, 25-30 cm long, glabrous, 1-4 mm thick. Capitulum c. 3 cm broad. Involucre c. 2 x 2 cm; dark-green; outer phyllaries reticulate, 6-10 x 2-3 mm, lanceolate, appressed, light to dark-green, smooth; inner ones linear, narrowly marginate, callose. Ligules yellow, peripheral ones with dark stripes outside. Anthers polleniferous. Styles and stigmas dull yellow. Cypselas 3 mm long, brownish, with sharp spinules above, rugose below; cone c. 0.7-1 mm long, conical-cylindrical, sub-abrupt; beak 8-10 mm long; pappus 5-6 mm long, white, scabrous.

A-8 Gilgit Distt.: Hunza, Ghamesar, c. 35 cm tall with rosulate leaves, growing in moist somewhat shady place, vern. name: "Shikinachi", 2300 m, 2.6.2002, *Jan Alam* 647 (KUH).

Distribution: Known from type gathering.

The present taxon apparently looks close to *Taraxacum alii* in the height of plant, length and shape of leaves. Both species are dark coloured and have same number of scapes. But *T. alii* S. Abedin has recurved outer phyllaries, both outer and inner phyllaries are corniculate or corunate; scapes 1-2 mm thick; cypselas 3.5-4 mm long; beaks 10-13 mm long; and petioles narrowly winged. While *T. janalamii* S. Abedin has appressed outer phyllaries, both outer and inner phyllaries are almost smooth; scapes 1-4 mm thick cypselas 3 mm long; beaks 8-10 mm long; and petioles broadly winged. This is also of interest that *T. janalamii* occurs in Gilgit at an altitude of 2300 m., while *T. alii* occurs at Campbellpur at an altitude of 600 m, 300 km in the South of Gilgit.

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References

- Dahlstedt, H. 1926. Über einige im orientalische *Taraxacum*. Arten, *Acta Horti Bergiani*, 9(1): 1-36.
- Doll, R. 1973. *Feddes Rept.*, 84: 1-180.
- Haglund, G.E. 1938. A list Fl. Pl. E. Turkestan & Kashmir, (Ed.): C. Persson, *Bot. Not.* 307.
- Handel-Mazzetti, H. von 1907. *Monographie der Gattung Taraxacum*, Leipzig & Wien.
- Kirschner, J. and J. Stepanek, 1987. Again in the sections in *Taraxacum* (Cichoriaceae). (Studies in *Taraxacum* 6). *Taxon.*, 36: 68-617.
- Kirschner, J. and J. Stepanek, 1996. Interpretation of some older *Taraxacum* names from Asia. *Edinb. J. Bot.* 53: 215-221.
- Kirschner, J. and J. Stepanek. 1977. A nomenclatural checklist of supraspecific names in *Taraxacum*. *Taxon.*, 46: 87-98.
- Kirschner, J. and J. Stepanek. 1994. Clonality as part of the evaluation process in *Taraxacum*. *Folia Geobot. Phytotax.* Praha 29: 265-275.
- Kirschner, J. and J. Stepanek. 2006. Dandelious in Central Asia. A taxonomic revision of *Taraxacum* section *Leucantha*. *Perslia*, 78: 27-65.
- Richards, A.J. and P.D. Sell 1976. In: *Flora Europaea*. (Eds.): Tutin *et al.* 4: 333-343, Cambridge.
- Schischkin, B. K. 1964. In: *Fl. USSR*. (Eds.): E.B. Bobrov & N.N. Tzvelev, 19: 405-560; 728-754. Leningrad & Mosqua.
- Soest, J.L. van. 1960. New species of *Taraxacum* from Asia in *Acta Bot. Neerland*, 9: 302-326.
- Soest, J.L. van. 1961. New species of *Taraxacum* from the Himalayan Region. *Bull. Brit. Mus. (Nat. Hist.) Bot.*, 2: 10: 263-273.
- Soest, J.L. van. 1963. *Taraxacum* species from India, Pakistan and neighbouring countries. *Wentia*, 10: 1-91.
- Soest, J.L. van. 1966. New species of *Taraxacum* from Asia I, Proceedings Koninklijke Nederland. *Akadem. van Wet.*, C69: 3: 361-388.
- Soest, J.L. van. 1966. *Wendelboa* gen. nov. and *Taraxacum* from Trich Mir, NW Pakistan. *Nytt Mag. Botan.*, 13: 71-86.
- Soest, J.L. van. 1975. In: *Flora of Turkey*, (Ed.): P.H. Davis. 5: 788-812, Edinburgh.
- Soest, J.L. van. 1977. In: *Flora Iranica*, (Ed.): K. H. Rechinger, 122: 223-285, Graz, Austria.

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