

Diversity, Ecology and Distribution of Indian Lactuceae (Asteraceae)

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ABSTRACT: The present communication deals with diversity, ecology and distribution of Indian Lactuceae (Asteraceae) which is represented by 10 genera namely *Lactuca* L., *Prenanthes* L., *Launaea* Cass., *Sonchus* L., *Reichardia* Roth, *Cicerbita* Wallr., *Ixeris* Cass., *Chondrilla* L., *Dubyaea* DC. and *Youngia* Cass., with 80 taxa in India. Among these 9 genera and 51 taxa are from the Western Himalaya, 7 genera and 31 taxa from Eastern Himalaya, 5 genera and 12 taxa from Western and Eastern Ghats and 6 genera and 15 taxa from Gangetic plains, Rajasthan and other parts of the country. The Lactuceae exhibit wide range of variations in its ecological habitats from sea coast to 5000 m in elevations and exhibit enormous diversity both intraspecifically and interspecifically. The Himalayas are shown to be a major centre for Lactuceae diversity and distribution followed by Western Ghats and Gangetic plains. At generic level *Lactuca* exhibits maximum diversity with 25 species followed by *Youngia* and *Cicerbita*, all three are predominantly Himalayan. The genus *Dubyaea* is endemic to Sino-Himalayan region with 9 species, while 6 of its 9 species are highly localized in this region. The maximum diversity of Lactuceae in the Himalaya is due to a variety of climatic conditions and altitudes which in turn has resulted in diverse habitats. The Lactuceae inhabit, every conceivable habitats and reveals a great amount of variation in the populations of different species. The distribution analysis of Lactuceae reveals that its members are chiefly distributed in the Himalaya and poorly represented in Western Ghats, Eastern Ghats and Gangetic plains.

KEY WORDS: Diversity, Ecology, Distribution, Indian Lactuceae.

INTRODUCTION

India's rich floristic diversity is undoubtedly due to immense variety of the climate and altitudinal variations coupled with varied ecological habitats. There are almost rainless areas in the west of the country and the highest rainfall areas of the world occur in the eastern sector. The altitude varies from sea level to some of the highest mountains of the world. The habitat types vary from the humid tropical Western Ghats to the cold deserts of Ladakh and snow-clad mountains of the Himalaya to the long warm coast-line stretches of Peninsular India. All these factors have greatly favoured the distribution and spread of Asteraceae (Rao and Datt, 1996). The Lactuceae is one of the dominant tribe of the family Asteraceae in the Indian flora. It is second largest tribe of Asteraceae after Senecioneae (Rao & Datt, 1996).

The Indian Lactuceae is treated as one of the eight subtribes of the tribe Cichorieae of the family Asteraceae (Hooker, 1881). The subdivision of tribe Cichorieae are also not

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unanimous. Most authors recognized eight distinct subtribes but again the terminology applied to these subtribes also vary from author to author (Mamgain & Rao, 1995). Lessing (1832) recognized seven subtribes which in many respect resemble those of the well known later treatment by Hoffmann. George Bentham who is considered to be one of the outstanding workers on the Asteraceae of the 19th century has not attempted any subdivisions of the tribe Cichorieae (Bentham & Hooker, 1873). Hoffmann (1891) recognized only five subtribes as also Jussieu (1789). Stebbins (1953) has divided the tribe Cichorieae into eight subtribes.

Confusion also prevails over the terminology of the tribe Cichorieae as used by different workers. They are a natural group, most distinctive and easily recognizable subdivision of the family Asteraceae. The treatment of the tribe as a separate family Cichoriaceae as has been proposed by some authors is not justified. Although the Cichorieae cannot be closely allied to any other single tribe of Asteraceae, the basic characters such as, the head inflorescence, the nature of the achenes, the usual presence of pappus in place of calyx etc., advocate the inclusion of the Cichorieae as a tribe of the family Asteraceae. Therefore, it is justified that the Cichorieae should be treated as a tribe of the family Asteraceae, rather than a separate family.

The Lactuceae is basically with an old group distribution (Bentham, 1973; Rao *et al.* 1988) is distributed in Africa, Eurasia, Mediterranean region, temperate Europe, Central Asia, China, temperate Asia and Australia. It is also distributed in North American and South America. However, quite a few genera are cosmopolitan while genus *Dubyaea* is endemic to Sino-Himalayan region. Phytogeographically the Lactuceae is distributed in Mediterranean, Paleotropical, Eurasian, North temperate, North America, Western and Central Asiatic, African Asiatic-Australian, Indian wide, Euro-Siberian and Sino-Japanese phytogeographical regions with mainly cold temperate region of the world (Rao & Datt, 1996). In India it is mainly distributed in Western Himalaya, Eastern-Himalaya, Western and Eastern Ghats, Gangetic plains and Rajasthan. The species are mainly distributed in the Himalaya and few in the Western and Eastern Ghats and in the plains.

The Indian Lactuceae consists of 10 genera namely *Lactuca* L., *Prenanthes* L., *Launaea* Cass., *Sonchus* L., *Reichardia* Roth, *Cicerbita* Wallr., *Ixeris* Cass., *Chondrilla* L., *Dubyaea* DC. and *Youngia* Cass. with about 80 taxa in India and represented by 9 genera and 50 species in North Western Himalaya alone. The Lactuceae shows great variation in the range of ecological habitats from tropical, subtropical, temperate, subalpine and even to alpine regions. There is a considerable diversity among the species of different genera.

The members of Lactuceae inhabit every conceivable habitat and reveal a great amount of variations in their populations. The distribution analysis of the tribe reveals that its members are chiefly distributed in the Himalaya mainly in cold temperate regions and poorly represented in Western Ghats, Eastern Ghats and Gangetic plains. The maximum diversity of the tribe Lactuceae in the Himalaya is due to a diverse climatic conditions and altitudes which in turn have resulted in diverse habitats from the cold deserts of Ladakh in Trans-Himalayan biogeographic zone to the evergreen tropical and temperate forests of Arunachal Pradesh in the East Himalayan Biogeographic zones.

The species diversity among different genera of Lactuceae in India is shown in Table 1, which indicates that number of species are higher in the Western Himalaya than in the Eastern Himalaya. Interestingly the Himalayan Indian Biogeographic zone which is

otherwise floristically rich due to high rainfall and ideal humid climate, shows a low diversity of Lactuceae.

Table 1: Distribution/ Diversity of Lactuceae (Asteraceae) in India.

Genera	Western Himalaya	Eastern Himalaya	Western and Eastern Ghats	Gangetic plains Rajasthan and other parts
1. <i>Lactuca</i> L.	16	5	2	2
2. <i>Sonchus</i> L.	4	5	4	4
3. <i>Launaea</i> Cass.	6	-	3	5
4. <i>Dubyaea</i> DC.	3	1	-	-
5. <i>Cicerbita</i> Wallr.	8	4	1	-
6. <i>Ixeris</i> Cass.	2	4	-	1
7. <i>Prenanthes</i> L.	3	5	-	-
8. <i>Chondrilla</i> L.	2	-	-	-
9. <i>Reichardia</i> Roth.	-	-	-	2
10. <i>Youngia</i> Cass.	6	7	2	1
Total	50	31	12	15

Table 2: Distribution/Diversity of Lactuceae in India and neighbouring countries.

Genera	India	China	Korea	Japan	Indo China
1. <i>Lactuca</i> L.	25	60	4	6	9
2. <i>Sonchus</i> L.	6	10	1	2	2
3. <i>Launaea</i> Cass.	8	4	-	-	2
4. <i>Dubyaea</i> DC.	3	7	-	-	-
5. <i>Cicerbita</i> Wallr.	11	7	-	-	-
6. <i>Ixeris</i> Cass.	5	14	6	14	-
7. <i>Prenanthes</i> L.	6	20	-	2	-
8. <i>Chondrilla</i> L.	2	3	-	-	-
9. <i>Reichardia</i> Roth.	2	-	-	-	-
10. <i>Youngia</i> Cass.	13	30	6	6	-
Total	81	155	17	30	13

MATERIALS AND METHODS

This investigation forms a part of the taxonomic revision of Indian Lactuceae and is based on extensive field survey and studies of various aspects such as population structure, range of ecological and morphological variations, the habitat requirements, geographical distribution and other characters. Most of the species studied are based on actual collections from different parts of the country. The field information and data were compared and analysed with available literature on the subject.

RESULTS AND DISCUSSION

The Lactuceae exhibits enormous diversity at various levels such as habitats, populations and species. There are large number of infraspecific variations and polymorphism in various species of Lactuceae. Almost 90% of species have rich populations diversity supported by habitat diversity. There are several populations within a species which show enormous variations in their habit, leaf morphology, nature of indumentum and size and shape of heads (capitula) and flowers. Wide range of variability has been observed in achenes morphological characteristics including achene shapes, colour, size and presence of ribs. Phenological variations are also greatly observed in different populations within species. These variations are observed due to diverse climatic, geographic and ecological conditions. Variations range to such an extent that several taxa have been transferred from one genus to another. However, detailed biosystematic studies are needed to determine the correct status of these infraspecific variants which may result in establishing the new species or even new genera.

The species of Lactuceae differ widely in habits, some approaching to species of *Launaea* others to *Prenanthes* and *Lactuca* and yet others again to *Crepis*. Hooker (1881) stated, 'I have found it impossible to group them by achenes or pappus and I have had recourse of characters of habit'.

In the Lactuceae leaf variation ranges from a simple, entire leaf to variously shaped leaves such as linear to ovate, obovate or oblanceolate, spathulate or orbicular, entire or dentate or serrate to pinnatifid or runcinate- pinnatifid or variously toothed, sagittate, lanceolate, or linear-lanceolate to oblanceolate, acute to acuminate, oblong or linear-oblong to ovate-oblong, deltoid or triangular-ovate to hastate, cordate, hastate-deltoid, elongate-obovate, broadly oblong, palmately lobbed, depending upon the populations of different species.

Species such as *Lactuca dissecta* D. Don, *L. dolichophylla* Kitam., *L. undulata* Ledeb., *L. decipiens* C. B. Clarke, *L. rapunculoides* (DC.) C. B. Clarke, *L. graciliflora* DC., *Sonchus oleraceus* L., *S. wightianus* DC., *Launaea procumbens* (Roxb.) Ramayya & Rajagopal, *L. asplinifolia* (Willd.) Hook. f., *Cicerbita cyanaea* (D. Don) Beauv., *C. lessertiana* (Wallich ex DC.) Mamgain & Rao, *Prenanthes brunoniana* Wallich ex DC. are highly polymorphic and having a number of variants in different populations within a species (Mamgain & Rao, 1995).

In the genus *Prenanthes* there is a great degree of polymorphism at both infraspecific and intraspecific levels. Species such as *Prenanthes brunoniana* Wallich ex DC. is highly polymorphic. Leaves are so variable that it is difficult to arrange their forms under any system. Hooker (1881) has treated these variants in three forms. 1-*allarifolia*- Leaves entire, cordate or ovate or oblong with the base truncate or cordate, obtuse or acute; petiole simple, slender, auricled at base. 2- *raphanifolia* - Leaves more or less pinnatifid with a ovate-lanceolate or deltoid, acute terminal lobe to which the leaf is sometimes reduced; petiole broadly winged, dilated or not at the base. 3- Leaves orbicular or broadly oblong, palmately 3-lobed, lobes cut and toothed; petiole simple or dilated.

Phenological variations are also greatly observed among populations of species of Lactuceae. These variations are not only confined to the colour of ligules and size and shape

of capitula (heads) but also wide range of variations in the flowering and fruiting periods of infraspecific populations depending upon the range of climatic and ecogeographical variations.

In the genus *Lactuca*, species such as *L. dolichophylla* Kitam., *L. dissecta* D. Don, *L. undulata* Ledeb., *L. rapunculoides* (DC.) C. B. Clarke, *L. decepiens* C. B. Clarke, show enormous phenological diversity among intraspecific and infraspecific populations. The ligule (flower) colour variation ranges from purple, pinkish, blue, white to yellowish. The flowering period among various populations of these species varies from January to October. The populations which are confined to tropical regions flowers early then to populations confined to the temperate and more higher altitude.

In the genus *Sonchus* flowering period in all species varies from March to December except *S. wightianus* DC. flowers throughout the years.

The genus *Lactuca* with about 150 species is cosmopolitan having at least two centres of origin. In the Republic of China alone this genus is represented by about 60 species. It seems Yunan, Szechuan and Kweichow form a centre of concentration of species. In the Asiatic centre about 17 species are endemic, which also favours the hypothesis that this province must be one of the centres of origin of the genus (Stebbins, *et al.*, 1953). In the Himalaya this genus is represented by 24 species, of which 5 are endemic. There are a few cosmopolitan species like *Lactuca serriola* L. and *L. sativa* L. (Stebbins, 1937).

In India *Lactuca* is the most dominant genus with about 25 species of which 16 species occur in North Western Himalaya and the rest in Eastern Himalaya and Southern India (Mamgain & Rao, 1987; Rao *et al.*, 1988). This genus exhibits great variations in its ecological requirements. Species such as *L. runcinata* DC. and *L. remotiflora* DC. are the typical species of South Indian plains, where these species occur in the tropical or subtropical regions. However, *L. runcinata* DC. is also reported from Kashmir whereas *L. remotiflora* DC. occurs in South Indian plains and Maharashtra. Similarly, *L. dissecta* D. Don shows great range of variations in its ecological habitats. It occurs in the plains of tropical to subtropical regions or even in temperate habitats up to an altitude of 2500 m and grows in fields, wastelands or even in the foothills, mostly on dry exposed conditions. Yet some other species represent the temperate and alpine habitats in open, exposed slopes, dry, humid and shady situations on north or south facing slopes. The characteristic species of temperate habitat is *L. dolichophylla* Kitam., which ascends upto 3500 m or even more. Similarly, *L. rapunculoides* (DC.) C. B. Clarke, *L. decipiens* C. B. Clarke, *L. kashmiriana* Mamgain & Rao and *L. lahulensis* Mamgain & Rao, are confined from temperate to sub-alpine habitats upto an altitude 4000 m. *L. rapunculoides* (DC.) C. B. Clarke rarely grows in temperate regions but chiefly occurs on sub-alpine habitat, where it also grows in association with *L. decipiens* C. B. Clarke, which normally grows in both the habitats. In general habit both species are closely allied and morphologically look similar making it difficult to distinguish the two when they grow together in close association.

The genus *Prenanthes* occurs in South Africa, the Canary Island, the Mediterranean region, Europe, Asia and America with a maximum concentration in Northern and Central Europe. In China this genus is represented by about 20 species, where over 60% species are known only by type collections. In the Himalaya this genus is represented by 6 species with two endemics, namely *P. sikkimensis* Hook. f. (Sikkim) and *P. scandens* Hook. f. & Thomson *ex* C. B. Clarke (Assam). *P. brunoniana* Wallich *ex* DC. is distributed from North

India eastwards to Yunnan and other provinces. The only 3 species distributed in the North-Western Himalaya are *P. brunoniana* Wallich ex DC., *P. violaeifolia* Decne and *P. sikkimensis* Hook. f., where they are confined to temperate, subalpine and alpine habitats upto an altitude of 5000 m. *P. sikkimensis* Hook. f. and *P. brunoniana* Wallich ex DC. grow mostly in temperate habitat, rarely in subalpine, at an altitude from 2000-3600m, whereas *P. violaeifolia* Decne occurs in subalpine and alpine habitats, where it grows on exposed rocks as well as along streams and on moist shady and humid situations. *P. brunoniana* Wallich ex DC. sometimes occurs on the forest floor (even under pine forests). Similarly, *P. sikkimensis* Hook.f. grows in associations with grasses on foothills.

Ixeris is another Asiatic genus, the species of which are distributed from Himalayan regions to Japan. There are only 3 species and two varieties in India, one *I. gracilis* (Wallich ex DC.) Stebbins from the Eastern Himalaya and two, namely *I. polycephala* Cass. and *I. sagittaroides* (C. B. Clarke) Stebbins from North-West Himalaya. Although 40 species are recorded for the adjacent Chinese regions, their correct taxonomic status is doubtful (Babcock & Stebbins, 1943). Several species of *Ixeris* are now treated by several workers under *Prenanthes*, *Youngia* and even under *Lactuca*. *Ixeris polycephala* Cass. is purely a tropical plant, often grows as a weed in the cultivated fields, whereas *Ixeris sagittaroides* (C. B. Clarke) Stebbins is confined to tropical and subtropical regions where it grows on exposed, moist and shady slopes in the forest and wastelands.

The genus *Cicerbita* is distributed widely in Asia, Central Europe, Siberia, Canada, U.S.S.R., North America and Central America, from temperate to alpine regions upto an altitude of 4500 m. In India it is represented by 11 taxa, mostly confined to temperate and alpine regions of Himalaya. *C. cyanea* (D. Don) Beauv. and *C. macrorhiza* (Royle) Beauv. are both represented in temperate, subalpine and even alpine habitats and grow on the shady rocks, moist shady slopes and humid situations. *C. lessertiana* (Wallich ex DC.) Mamgain & Rao is confined to subalpine and alpine habitats where it grows on meadows. The bluish florets along with blackish involucre bracts are the characteristic of this species in the field.

Dubyaea which is considered to be most primitive genus of the subtribe, occurs only in the alpine habitats. It is endemic to Sino-Himalayan region with 9 species (Stebbins, 1940). But represented by only two species and one subspecies in India. The medium sized herbs with pretty yellow ligules, broad, campanulate heads with densely hispid involucre bracts and peduncles are the characteristic of the genus in the field, where both species grow on open exposed or shady localities in moist and humid conditions.

The species of *Dubyaea* show a remarkably high degree of endemism. The genus itself is endemic to Sino-Himalayan region, where 6 of its 9 species are highly localized. In India it is distributed by two species namely *D. hispida* D. Don which occurs in both the Himalaya and the Chinese mountains and *D. oligocephala* which occurs in North West Himalaya. *D. oligocephala* also occupies an isolated range with respect to the other species *D. hispida*.

Sonchus is a cosmopolitan, weedy genus distributed in tropical Africa, West tropical Africa, Southern Sudan, Ethiopia, South Africa, Canary Island, Morocco, Europe, N. W. Asia, Mediterranean region, Iran, Iraq, Egypt, Afganistan, Eastern Asia, Turkistan and Central Asia (Boulos, 1972). This genus is represented by 5 taxa in India and all these occur in North Western Himalaya. These are *S. wightianus* subsp. *wightianus* DC., *S. wightianus* subsp. *wallichianus* (DC.) Boulos, *S. asper* (L.) Hill, *S. brachyotus* DC. and *S. oleraceus* L., which are confined to tropical, subtropical and temperate regions upto an altitude of 3000 m.

S. oleraceus L. is wide spread and sometimes grows in subalpine habitat. *S. wightianus* DC. subsp. *wightianus* DC. which is often wrongly treated under *S. arvensis* L. (an European species), mostly flowers throughout the year and usually grows on old walls, by roadsides, slopes, on exposed, open or shady, moist, humid and even in dry situations on the foothills. *S. brachyotus* DC. is often confused with *S. wightianus* subsp. *wightianus* DC. but differs from the latter in absence of glandular hairs on peduncle and involucre. Both have the common ecological distribution. But *S. brachyotus* DC. is a plant of rare occurrence (Rao & Rao, 1978), whereas *S. wightianus* subsp. *wightianus* DC. is very common. *S. asper* (L.) Hill is usually confined to tropical, subtropical or even to temperate habitats and grow on the fields, wastelands, walls or even as a weed in the cultivated fields. *S. jainii* Chandrabose *et al.*, a recently described species (Chandrabose *et al.*, 1984) from South India is perhaps an ecotype of *S. wightianus* DC. subsp. *Wightianus* DC. (Mamgain, 1994).

Launaea is distributed in South East Asia, Central Asia, Europe and Africa and represented by about 8 species in India, of which only 6 species occur in North Western Himalaya. These are *L. acaulis* (Roxb.) Babcock ex Kerr., *L. asplinifolia* (Willd) Hook. f., *L. microcephala* Hook. f., *L. polyclada* (Boiss.) Burkill, *L. procumbens* (Roxb.) Ramayya & Rajagopal and *L. secunda* (Royle ex C. B. Clarke) Hook. f. Most of the species are confined to tropical, subtropical and temperate habitats upto an altitude of 3500 m, while few others like *L. sarmentosa* (Willd) Sch.-Bib. ex Kuntze grow in the sandy desert near seashore or river banks. *L. acaulis* (Roxb.) Babcock ex Kerr. and *L. procumbens* (Roxb.) Ramayya & Rajagopal usually distributed in tropical and subtropical regions, where they grow in the cultivated fields and wastelands. *L. secunda* (Royle ex C.B. Clarke) Hook. f. is a characteristic species of temperate region, where it grows on open exposed slopes, and moist shady slopes.

The genus *Chondrilla* with only two species in India is distributed in Asia and Europe. *C. graminea* M. Bieb and *C. setulosa* C. B. Clarke are rare and known only from Kashmir in the North Western Himalaya. These species are confined to exposed, dry slopes in temperate to subalpine regions. *C. setulosa* C. B. Clarke is endemic to Kashmir.

The genus *Reichardia* is distributed in Europe, North Africa, West Asia and Canaries from tropical to subtropical regions with about 16 species. In India, the genus is represented by two taxa and confined to Gangetic plains of Uttar Pradesh and also in Ajmer district of Rajasthan on the wastelands upto an altitude of 500m.

Youngia is also an Asiatic genus occurring from the Himalayan region eastwards to Japan. There is a greater concentration of the species in China, where about 30 species are reported, in comparison to Himalayan region where only 13 species are reported (only 5 species are confined to North Western Himalaya) from tropical to subtropical, temperate and alpine habitats.

CONCLUSIONS

The Lactuceae is an intricate group of plants and show enormous diversity in the range of habitats and morphology. The group is distributed almost in all habitats from tropical, subtropical, temperate, subalpine and even to alpine regions. Considerable diversity has been observed at intraspecific and infraspecific levels in the Lactuceae. Phenological diversity is

also greatly observed at both levels. The rich diversity in Lactuceae is supported by its highly adaptive capability to the diverse climatic, geographical and ecological conditions. Variations range to such an extent that several taxa have been frequently transferred from one genus to another.

Lactuca is the most dominant genus of Lactuceae with 25 species in India, of which 24 species are found in the Himalaya and 5 species of them are endemic. Of the 24 species found in the Himalaya, 16 species are found in the Western Himalaya, 5 species in Eastern Himalaya and 2 species each in Western and Eastern ghats and Gangetic plains, Rajasthan and other parts of the country. *Chondrilla* and *Reichardia* are the smaller genera represented by two taxa each in India, of which *Chondrilla* is confined to Western Himalaya whereas *Reichardia* is distributed in the Gangetic plains and Rajasthan and is the only genus of Lactuceae which does not occur in Himalaya.

Lactuceae is richly distributed in the Himalaya and represented by 50 taxa from the Western Himalaya and 31 taxa from the Eastern Himalaya. The Eastern and Western ghats are represented by only 12 taxa while Gangetic plains, Rajasthan and other parts with 15 taxa.

Lactuca is cosmopolitan with about 150 species and having at least two centres of origin. China is one of its centre of origin with 60 species where as Asiatic centre is the another centre of origin in which Himalaya is the main centre of origin of *Lactuca* with 24 species of which 5 are endemic.

There are few more cosmopolitan genera in Lactuceae namely *Prenanthes*, *Sonchus*, *Cicerbita* and *Launaea* whereas *Ixeris* and *Youngia* are the Asiatic genera occurring from the Himalayan regions eastwards to Japan.

Dubyaea considered to be the most primitive genus, is the only genus of Lactuceae, endemic to Sino-Himalayan region with 9 species (Stebbins, 1937).

Although the members of Lactuceae have highly adaptive value and can survive and multiply in all ecogeographic situations from desert to alpine habitats, some species are unsuccessful in coping with the competitive ability of other species and have thus become very rare and confined to very restricted pockets only. A few such species are *Lactuca undulata* Ledeb., *Lactuca benthamii* Clarke, *Lactuca cooperi* Anthony, *Cicerbita filicina* (Duthie ex Stebbins) Mamgain & Rao and *Chondrilla setulosa* Clarke. However, extensive field surveys are to be taken to know the actual population status of these species and efforts should be made to conserve these species to ensure their survival.

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印度萵苣族(菊科)植物之歧異度、生態及分佈

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摘 要

本文探討印度萵苣族植物(菊科)之歧異度、生態及分布。印度有萵苣族植物十屬八十個分類群，十個屬分別為 *Lactuca* L. (萵苣屬)、*Prenanthes* L. (福王草屬)、*Launaea* Cass. (栓果菊屬)、*Sonchus* L. (苦苣菜屬)、*Reichardia* Roth、*Cicerbita* Wallr. (岩參屬)、*Ixeris* Cass. (苦蕒菜)、*Chondrilla* L. (粉苞苣屬)、*Dubyaea* DC. (厚喙菊屬)、*Youngia* Cass. (黃鵪菜屬)。其中9屬51群產于西喜瑪拉雅區，7屬31群東喜瑪拉雅，5屬12群來自 Ghats 東、西區，另有6屬15群分佈於 Gangetic 平原、Rajasthan、及印度其他地區。印度的萵苣族植物其棲地即展現相當大的多樣性，由海岸至海拔5000公尺皆有分佈，且其種間和種內的歧異度極大。萵苣族的歧異及分佈中心在喜瑪拉雅地區，然後是西 Ghats 區及 Gangetic 平原區。在遺傳層次上，萵苣屬具最大歧異度分化，有25個分類群，其次是黃鵪菜屬和岩參屬；三者喜瑪拉雅皆佔優勢。具有9個種的厚喙菊屬是中國-喜瑪拉雅地區之固有屬，其中6種在本區更是高度地域性的。萵苣族在喜瑪拉雅地區之所以具有最大歧異度，主要原因是氣候及海拔高度之多樣性變化，致使其棲地亦多變化。萵苣族可於多種棲地存活並展現其不同種的族群中大量的變異。由萵苣族的分佈分析得知，主要分佈地是喜瑪拉雅地區，在東、西 Ghats 及 Gangetic 平原則不具代表性。

關鍵詞：歧異度、生態、分佈、印度萵苣族。

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