

Diversity Of Orchids In Uttarakhand And Their Conservation Strategy With Special Reference To Their Medicinal Importance

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Abstract

Orchids are under duress species. These are becoming a rarity, losing out to human greed. These species are not only important for their aesthetic value but also because they work as ecological indicators. Their disappearance indicates a change in the quality of soil and air of the region. In the present communication diversity of orchids in Uttarakhand has been studied. 72 genera with 236 species of orchids are recorded from Uttarakhand. Among them 17 species are found medicinally important. 12 Taxa are recorded in red data book of Indian plants. Rapid depletion of orchid species requires urgent conservation measures. There is a need for educational programmes on importance of orchids and their role as essential components of state biodiversity. [Report and Opinion. 2009;1(3):47-52]. (ISSN: 1553-9873).

Key words: Orchids, uttarakhand, conservation, medicinal plant

Introduction

Uttarakhand lies between 28-41' and 31-28' N latitude and 77-35' and 81-01' E longitude. The region has 53,483 sq.km. total geographical area and about 64.8% of its area under forest cover (FSI, 1999). The varied topography and climatic conditions met within the state are conterminous with a very rich biodiversity.

The vegetation of the State ranges from tropical deciduous to alpine vegetation and is broadly categorized into

1. Subtropical in the lower altitude region up to 800 m. It comprises moist tropical and dry deciduous vegetation.
2. Temperate-found at an altitude ranging from 700-1400 m.
3. Sub alpine and Alpine- found above 3000 m.. An area of about 1000 sq. km. In the Northwestern part of Uttarkashi district of the state falls in the cold desert represent alpine scrubs.

The altitudinal variations and climatic changes in the state have shown the great diversity in the habit, which resulted in luxuriant and varied floristic composition.

Beautiful flower orchids are becoming a rarity, losing out to human greed. Orchids are not only important for their aesthetic value but also because they work as ecological indicators. Their disappearance indicates a change in the quality of soil and air of the region. The ubiquitous "Blue vanda" of cheerapunjee has disappeared due to the degradation of the environment. Orchids are mainly shade loving; therefore, they have no chance of survival, once forests are cleared. While clearing forests for cultivation, many trees, bearing orchids die.

Orchids are mysterious in many ways. These are increasingly being cultivated throughout the world. The incredible shapes and colours of their flowers and their long vase-life have attracted many generations' of mankind. There are over 17,000 species of orchids the world over. This is one of the largest, families of flowering plants and found abundantly in tropics. Even though all of them are perennial herbs, they may be land-plant, lithophytes, epiphytes, saprophytes, etc and show a great diversity in their floral structure, developed mainly as a result of their adaptation to pollination by a wide variety of insects. 1141 species of orchids in 166 genera are recorded from India. Of these, 657 species in 86 genera are

epiphytes and 484 species in 82 genera are terrestrial. The genera *Cymbidium* and *Liparis* have both epiphytic and terrestrial species (Arora, 1980; Bhattacharya, 1969; Das and Jain, 1980; Hajra, 1983; Kothari, 1983; Issar and Uniyal, 1967, Kummar and Lal, 1994; Malhotra and Balodi, 1984; Balodi and Malhotra, 1985).

In Uttarakhand 72 genera with 236 species of orchids are recorded. Taking all the monocotyledonous families into account Orchidaceae is the 2nd largest family after Poaceae in Uttaranchal. Genus *Habenaria* with maximum-17 species followed by *Dendrobium*-16 species and *Bulbophyllum* with-II species.

Orchids are popular for their healing properties too, *Vanda parviflora* is said to have antiviral and anti cancerous properties (Pangtey and Kalakoti, 1983; Rawat and Pangtey, 1983, 1985).

Methodology

Extensive survey of Uttarakhand state was carried out under plant exploration programme from 1980-2005. Identification of orchid was made with the help of floristic literature and specimens lodged in herbarium of Regional Research Institute (Ay), CCRAS, Tarikhet, Ranikhet, Uttarakhand. The herbarium of B.S.I. (BSD) and FRI (DO), Dehradun Uttarakhand were also consulted.

Constraints and opportunities

Orchids are protected species under the convention on International Trade in Endangered species (CITES) under schedule VI of the wild life protection Act (1972), all the nine species of "Lady's slipper" can only be sold if they are grown in registered nursery. Among Indian orchid species *Cymbidium*, *Dendrobium* and *Vandas* are endangered.

Orchids are also threatened by over grazing of livestock, construction of roads, dams, bridges, natural factors like forest fires, over extraction etc. The changing pattern of rainfall and decrease in the forest cover has contributed to their decrease. Rainfall is decreasing every year. This affects the growth of orchids that thrive in regions with regular rainfall.

Creation of public awareness and promotion of conservation strategies is essential. The orchids also have a good market because of their medicinal property. The tuber of 'Salampunja' (*Dactylorhiza*) is a valuable medicine. However businessmen are apprehensive about investing in the regions because of insurgency and poor infrastructure. In spite of the diversity many species are yet to be discovered because of difficult terrain in this region. With more and more wild places being opened up for tourism, the beautiful orchids have been the most affected. Every tourist wants to take home these exotic beauties. Awareness among tourist with special informative posters can certainly help to check this vandalism. There are several more plant species waiting to be discovered, but they may disappear even before we come to know about their existence. This will be a permanent loss to mankind.

Botanical excursion students in their misguided enthusiasm collect bag full of specimen. Such wasteful activity needs to be regulated or even curbed, often batches after batches of students come to collect certain plant group that are not common. This has already resulted in the disappearance of several plant populations. More than the students, it is the teaching fraternity that needs to be reoriented in such practices. Backed by vigorous conservation awareness programmes, students should be encouraged not to pick, not to up root.

The time has come to study plant communities as living ecological components and not just as dried herbarium. There is a need for educational programmes on importance of orchid and their role as essential components of the state biodiversity.

Conclusion and discussions

Orchids are mostly collected from the wild using non sustainable, destructive method like collecting the entire plant, rhizome, tuber, roots other reproductive parts like fruit and seeds. Such destructive collection methods are the major factors influencing orchid population. Further, low regeneration rate and loss of habitat add to the serious threat to orchid population. Such rapid depletion from the wild requires urgent conservation measures. Fore seeing the fate of some commercially important orchids, efforts have been initiated to cultivate these species.

The seed germination is erratic in orchids therefore tissue culture technique should be applied for their cultivation. Cultivation for sustainable utilization has been recommended as one of the most urgent task. However, propagation techniques are yet to be perfected or no attempt at all has been made to cultivate the orchid. For this reason, husbandry research, limitation factor research and life history studies

have been recommended. Many of them because of their small population size and restricted distribution, require intensive care and habitat management and may survive only with human support. One has to take into consideration that a commercial need for such resources is actually the need of the people and unless alternatives provided through cultivation, wild species will not be secure.

Orchids genera & species in Uttarakhand

SI	Genera	Species
1.	<i>Acampe</i> Lindl	2
2.	<i>Aerides</i> Lour	2
3.	<i>Anoectochilus</i> Blume	1
4.	<i>Aorchis</i> Vermeulen	2
5.	<i>Aphyllorchis</i> Blume	2
6.	<i>Archineottia</i> Chen	1
7.	<i>Arundina</i> Blume	1
8.	<i>Ascocentrum</i> Schltr. ex J.J. Sm.-	1
9.	<i>Brachycorthis</i> Lindl	1
10.	<i>Bulbophyllum</i> Thouars	11
11.	<i>Calanthe</i> Ker- Gawl	8
12.	<i>Cephalanthera</i> Rich	1
13.	<i>Cheirostylis</i> Blume	1
14.	<i>Chiloschista</i> Lindl	1
15.	<i>Cleisostoma</i> Blume	1
16.	<i>Coelogyne</i> Lindl	5
17.	<i>Corallorhiza</i> Gagnebin	1
18.	<i>Cryptochilus</i> Wall.	1
19.	<i>Cymbidium</i> Swartz	9
20.	<i>Cypripedium</i> Linn.	4
21.	<i>Dactylorhiza</i> Necker ex Neuski	1
22.	<i>Dendrobium</i> Swartz	16
23.	<i>Didicicia</i> king & Prain ex King & Pantl	1
24.	<i>Diphylax</i> Hook f.	1
25.	<i>Diplomeris</i> D.Don	1
26.	<i>Epipactis</i> Zinno	3
27.	<i>Epipogium</i> Gmelin ex Borkhaussen	2
28.	<i>Eria</i> Lindl	9
29.	<i>Eulophia</i> R.Br. ex. Lindl	9
30.	<i>Flickinfleria</i> Hawkes	2
31.	<i>Galeala</i> Lour.	1
32.	<i>Gastrochilus</i> D.Don	4
33.	<i>Gastrodia</i> R.Br.	1
34.	<i>Geodorum</i> G. Jackson	1
35.	<i>Goodyera</i> R.Br.	6
36.	<i>Gymnadenia</i> R.Br.	1
37.	<i>Habenaria</i> Willd.	17
38.	<i>Hemivilia</i> Lindl	1
39.	<i>Herminium</i> Linn	8
40.	<i>Kinidium</i> P.F. Hunt	2
41.	<i>Livaris</i> L.C. Rich	10
42.	<i>Listera</i> R.Br.	4
43.	<i>Luisia</i> Gaud	3
44.	<i>Malaxis</i> Soland ex Swartz.	7
45.	<i>Neottia</i> Guettard	2
46.	<i>Neottianthe</i> (Reichb.)Schltr	2

47.	<i>Nervilia</i> Comers.ex Gaud.	7
48.	<i>Oberonia</i> Lindl	9
49.	<i>Oreorchis</i> Lindl	3
50.	<i>Ornitho chillus</i> (Lindl) Wall ex Benth.	1
51.	<i>Otochilus</i> Lindl	1
52.	<i>Pachystoma</i> Blume	1
53.	<i>Pecteilis</i> Rafin	2
54.	<i>Pelatantheria</i> Ridl	1
55.	<i>Peristylus</i> Blume	9
56.	<i>Phaius</i> Lour	1
57.	<i>Pholidota</i> Lindl ex Hook	2
58.	<i>Platanthera</i> Rich	2
59.	<i>Pleione</i> D.Don	4
60.	<i>Ponerorchis</i> Reichb.f.	
61.	<i>Pteroceras</i> Hasselt ex Hassk	1
62.	<i>Rhynchostylis</i> Blume	1
63.	<i>Satyrium</i> Swartz.	1
64.	<i>Smitinandia</i> Holtt.	1
65.	<i>Sviranthes</i> Rich	2
66.	<i>Sunivia</i> Lindl	1
67.	<i>Thelasis</i> Bhime	1
68.	<i>Thunia</i> Reichb.f.	1
69.	<i>Tropidia</i> Lindl	1
70.	<i>Vanda</i> W.Jones ex R.Br.	5
71.	<i>Vandopsis</i> P fitz.	1
72.	<i>Zeuxine</i> Lindl	3
	Genera- 72	Species 236

Medicinal orchids of Uttarakhand

- Aerides multiflorum* Roxb. Epiphytic on miscellaneous forest of Siwalik ranges and sub montane Himalaya
 Vern. – Maana Fl. &Fr.: Jun-Aug
 Uses: Leaf paste applied as poultice on cuts and wounds.
- Calanthe tricarinata* Lindley Terrestrial grassy localities of montane forests in Vern- Syoru damp and shady places Fl.&Fr. March-Sept
 Uses: Leaf paste applied on sores and eczema. Leaves and pseudo bulbs believed as an aphrodisiac by locals
- Coelogyne cristata* Lindley Usually epiphytic on rocks or epiphyte on Vern- Gondya, Harjojan montane forests, Fls & Fr.-March-June.
 Uses: Infusion of pseudobulbs given in constipation as also as an aphrodisiac.
- Epipactis helleborine* (L.) Crantz Terrestrial, montane forests under damp shady Vern.- Trindrya places Fls.& Fr.-July-Oct.
 Uses: Infusion of leaves given in intermittent fever. Rhizome regarded as an aphrodisiac.
- Eulophia dabia* (D.Don) Hoch. Terrestrial, rare, associated with dense forest Vern- Misri, Salip, floor, Submontane to montane Himalaya, Salam mishri, Munjatak Fl.&Fr. March-May
 Uses: Tubers are given to infants in cough and cold.
- Goodyera repens* (L.) R.Br. Terrestrial, in shaded oak forest floor, in Vern: Girwara montane and alpine Himalaya, Fls Fruit-Aug-Oct.

Uses: Plant paste externally applied in syphilis, extract is taken as a blood purifier.

All the species of *Habenaria* generally exploited as the trade name Riddhi/Viridhi

7. *Habenaria intermedia* D. Don. In moist shady places of montane forest,
Vern: RidhilViriddhi (Sans) generally in open grass land. Fl & Fr. July- Sept.
Uses: The One of the ingredient of Astavarga of Ayurveda, used as tonic.
8. *Habenaria marginata* Colebr. Terrestrial on grassy slopes, forest
Vern- Haldya-Jari cover submontane to montane Himalaya, Fl. & Fr. - July
Uses: Thoroughly boiled plant extract taken in flatulence.
9. *Herminium lanceum* Terrestrial, common in shaded and wet
(Thunb. ex Susartz) Vuijk. Forest, rock shelters in montane and alpine
Himalaya. Fl. & Fr. - July-Sept.
Uses: Extract of plant given in suppressed
urination.
10. *Malaxis acuiminata* D. Don. Terrestrial, damp and shady forest
Sanskrit name-Jeevak, submontane to alpine Himalaya Fls. & Fr.-
Rishbhak, Munjatak Aug-Oct.
Vern.- Lasuni
Uses: One of the ingredient of "Astavarga"
medicine of Ayurveda. Locally the bulbs are
used in bronchitis as well as given as a tonic.
11. *Habenaria intermedia* D. Don. In moist shady places of montane forest,
Vern: RidhilViriddhi (Sans) generally in open grass land. Fl & Fr. July-
Sept.
Uses: The One of the ingredient of Astavarga of
Ayurveda, used as tonic.
12. *Malaxis muscifera* (Lindley) Kuntze Terrestrial in moist shady forest grassy
Sansk- Rishbhak / jeevak slopes of montane zone. Rare fls & Fr.
July-Sept.
Uses: One of the ingredient of "Astavarga" medicine.
The under ground parts used as tonic.
13. *Pholidota articulata* Lindley. Epiphytic on rock and trees in submontane
Sanskrit - Jeevanti to montane Himalaya Fls. & Fr. -Apr.-May.
Uses: Whole plant used as tonic.
14. *Satyrium nepalense* D. Don. Terrestrial, in open grassy slopes in montane to Vem-Saleep,
salam mishri alpine slopes. Fls. & Fr. - July- Oct.
Uses- Root used as tonic and also used in diarrhoea,
tubers edible.
15. *Spiranthes sinensis* (Persoon) Ames Terrestrial in open grassy slopes
Vem-Phirtya submontane to montane Himalaya Fl. &
Fr. -May-July.
Uses: Decoction of plant given in intermittent fever,
tubers used as tonic.
16. *Vanda cristata* Linn. Epiphytic in montane zone. Fls & Fr.-May-July.
Sans-Rasna
Uses: Stem and leaf extract used as a tonic.
17. *Dactylorhiza hatagirea* (D. Don) Terrestrial, Tubers palmate in subalpine
Vem-Hathajari, Salampunja and alpine Himalaya in open moist
localities. Fl. & Fr.-June-Oct.
Uses: Used as general tonic, as aphrodisiac and
in bronchitis.

(Abbreviation used: Vern-Vernacular name, Sans.-Sanskrit name)

Rare endangered Orchid of Uttarnakhand

Rare endangered Orchid of Uttarnakhand recorded in Red Data book of Indian Plants (Nair and Shastry, 1987, 1988, 1990):

TAXA	RDB Status
1. <i>Aphyllorchis gallani</i> Duthie	Endangered
2. <i>Archinottia microglottis</i> (Duthie) Chen	Rare
3. <i>Cyperipidium elegans</i> Reichb.f.	Rare
4. <i>Cyperipidium himalaicum</i> Rolfe	Rare
5. <i>Diplomeris hirsuta</i> (Lindl.) Lindl	Vulnerable
6. <i>Eria occidentalis</i> Seid	Rare
7. <i>Eulophia mackinnonii</i> Duthie	Rare
8. <i>Flickingeria hesperis</i> Seid	Endangered
9. <i>Aphyllorchis parviflora</i> King & Pant!	Rare
10. <i>Calanthe alpina</i> Hookf.ex.Lindl.	Rare
11. <i>Calanthe pachystalix</i> Reichb.f. ex. Hook f.	Endangered
12. <i>Cypripedium cordigerum</i> D. Don	Rare

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