



## Living Gymnosperms of Uttaranchal State of India

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### ABSTRACT

The paper throws light on diversity and economic importance of gymnosperms of Uttaranchal State of India. The region is dominated by Northern Hemisphere taxa which cover large areas. The conifer forests are more extensive and gregarious. As per the records available at BSA, 40 species belonging to 18 genera and 9 families are known from different localities of the state. Many exotic/ornamental species have been introduced in recent past while some are truly indigenous to this region e.g. *Cedrus deodara*-the sacred *Deodar*. There are some immense strands of *deodar* in Garhwal near Mundali and Balcha. A 2.5 m wide section of 750 years old *deodar* of Tons Division, near Belcha in Tehri Garhwal is preserved in Forest Research Institute at Dehradun. However *Deodar* is absent in Kumaon. The medicinal plants viz. *Taxus wallichiana* and species of *Ephedra* are well represented in the area, *Pinus gerardiana* whose seeds constitute one of the costliest and much liked dry fruit viz. '*Chilgoza*', also grows wild in this state.

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**Uttaranchal State** of India is situated between the geographical limits of 28°42'-31°28'N and 77°05'-81°05'E and stretches about 358 km from East to west and 320 km North to south covering an area of 53,79,562 sq. km. Uttaranchal which forms the North-West border area of the country has international boundaries with China (Tibet) in the North and Nepal in the East. On its North-West and West lies Himachal Pradesh, while on its South is Uttar Pradesh. This region is separated by river *Tons* from Himachal Pradesh in the west and by river *Kali* in the East from Nepal.

The Botanical panorama of this region is very rich and spectroscopic. Infact, wide diversity in meteorological, geographic and ecological patterns, has specially bestowed the region with unique and yet enormously diverse vegetational wealth aptly represented by sub-tropical to almost arctic type of flora. Further, the abrupt rise and fall in altitude coupled with specific local topography and micro-climatic conditions within different physiographic zones, have led to the origin of some 'distinct' plant associations.

The state is rich in forests of chir, pine, other conifers and broad-leaved temperate trees as well. Higher-up, forests of *deodar*, *blue-pine*, *spruce* and *silver fir* occur. Many conifers, *junipers* and dwarf *willows* also occur here in temperate zone. The temperate zone extends from the upper limit



of the temperate zone of about 4750 meters or even higher. The characteristic trees of this zone are the Gymnosperms or the naked-seeded plants viz. *high-level silver fir*, *silver birch* and *junipers* etc.

**Gymnosperms** are the naked seeded flowering plants whose population once dominated the earth. These are regarded as intermediate between pteridophytes and angiosperms. Gymnosperms are useful to the human society in many ways. They yield valuable timber, edible materials (*Chilgoza*-seeds of *Pinus gerardiana*; *sago*-pith of *Cycas revoluta* and other spp. as well), narcotic (*Cycas circinalis*), Canada balsam (*Abies balsamina*) etc. *Taxus wallichiana* (Asian yew) is the source of 'Taxol' which is employed to cure breast and ovarian cancer in human beings, *Ephedrine* used in asthma, is obtained from *Ephedra* species. In addition to these, they are highly preferred ornamentals.

But little is known about these precious elements of Indian flora. Work of Hooker (1885) and Duthie (1903-29) is based on over a century old specimens. Since then a lot of changes have occurred in political boundaries of the country and the states as well and of the habitats too. The latest work of Sahni (1997) is the only authentic work available at present on Indian Gymnosperms but it has several lacunae and rather incomplete. Due to lack of knowledge of the natural resources around us, the human society faces serious problems in fulfilling his basic needs of life. Due to wrong identity of the plants many reputed drugs prove to be ineffective leading to severeness of the diseases or even death. For example: foliage of the *Abies densa* and *Taxus wallichiana* are quite similar and if the trader supplies the leaves of *Abies densa* in place of *Taxus wallichiana* (due to ignorance), the Cancer patient who could have survived, will certainly die.

In view of these facts, the present study has been taken up under All India Coordinated Project on Taxonomy, sponsored by Ministry of Environment & Forests, Govt. of India. to prepare an illustrated manual of Gymnosperms (which are used in various way by human beings) of India so that no one could suffer due to lack of identity of the plants.

Present report is based on scrutiny of the literature available at BSA. The Gymnosperms recorded so far from within the political boundaries of Uttaranchal State are enlisted in Table-I.

**Table-I: Gymnosperms recorded from Uttaranchal State**

Family	Name of the Plant	Locality
Cycadaceae	<i>Cycas circinalis</i> L.	Dehradun, extending upto 1020m.
	<i>Cycas revoluta</i> Thunb.	Dehradun (planted)
Ginkgoaceae	<i>Ginkgo biloba</i> L.	Nainital, (near the government house), Mussoorie, Planted
Pinaceae	<i>Abies pindrow</i> Royle	Throughout the central and inner ranges (2500-3000m.); Deoban and Hanuman chatti, (2400-3000m.) Yamnotri (3200m.), Nainital, Lariakanta

	<i>Abies spectabilis</i> (D. Don.), Mirb.	Above Yamunatri-Gangotri (3000-3800m), Yamnotri 3200m.
	<i>Cedrus deodara</i> (Roxb.) G. Don	Tehri - Garhwal (2100-2550m.), Jaunsar, Harsil (2653m.), Bhairoghathi, Chakrata (2100m.) Kansar (2300m.), Deoban (2700m.)
	<i>Picea smithiana</i> (Wall.) Boiss.	Along the main Himalayan range above 2000m., Doban (2700m.), Nainital
	<i>Pinus caribea</i> Moor.	Planted.
	<i>Pinus gerardiana</i> Wall. ex Lamb.	Uttarkashi, Nainital, Gangotri, Nandadevi, Chakrata.
	<i>Pinus patula</i> Schiede & Deppe	Planted.
	<i>Pinus roxburghii</i> Sargent	Throughout the Kumaon Hills 500-2500m., Nainital, Rungit valley. Mussoorie hills. Assarori, (600m.) Kathnaur, (1200-1800m.), Garhwal Himalaya, near Barkot & Uttarkashi, Chamba (1800m).
	<i>Pinus strobus</i> L.	Planted.
	<i>Pinus wallichiana</i> A.B. Jackson	Harsil (2653m.), (situated at the confluence of Hariganga & Bhagirathi), on the way of Gaumukh, Kansar (2300m.)
	<i>Tsuga dumosa</i> (D.Don.) Eichler	S.I.
<b>Taxaceae</b>	<i>Taxus wallichiana</i> Zucc.	Jaunsor and Tehri-Garhwal, (800-3000m.), Jadi Block, Deoban, Tutuna block, Mundoli, Mussoorie, Gobind ghat (2800m)
<b>Podocarpaceae</b>	<i>Podocarpus gracilior</i> Pilger	Planted (Dehradun)
<b>Araucariaceae</b>	<i>Agathis robusta</i> (C.Moor) F.M. Bailey	Planted (Dehradun)
	<i>Araucaria bidwillii</i> Hook.	Planted (Dehradun)
	<i>Araucaria columnaris</i> (Forst.) Hook.	Planted (Dehradun)
	<i>Araucaria cunninghamii</i> Sweet.	Planted (Dehradun)
<b>Cupressaceae</b>	<i>Cupressus cashmeriana</i> Royle ex Carriere	Planted (Dehradun)



	<i>Cupressus funebris</i> Endl.	<i>S.l.</i>
	<i>Cupressus goveniana</i> Gord.	<i>S.l.</i>
	<i>Cupressus sempervirens</i> L.	Planted. (Dehradun)
	<i>Cupressus torulosa</i> D.Don	Nainital, (commonly planted in graveyards and cemeteries. )
	<i>Juniperus chinensis</i> L.	<i>S.l.</i>
	<i>Juniperus communis</i> L.	Nainital, Kumaon (3000-4000m.) Bhojbasha (situated at the confluence of Baitarni and Bhagirathi).
	<i>Juniperus indica</i> Bertol	Bhyundar valley, vasudhara (3000-4000m.)
	<i>Juniperus polycarpus</i> C. Kock	Way to Nelang-Naga (3500-4000m.)
	<i>Juniperus procera</i> Endl.	<i>S.l.</i>
	<i>Juniperus recurva</i> Buch.- Ham. ex D.Don	Nainital at height of the town, Malari. (3500m.)
	<i>Juniperus squamata</i> Buch.-Ham. ex D.Don	Tehri - Garhwal (3600m.) upward: Chansil, Gangotari, etc.
	<i>Thuja occidentalis</i> L.	Planted.
	<i>Thuja orientalis</i> L.	Planted (Mussoorie)
<b>Taxodiaceae</b>	<i>Cryptomeria japonica</i> L.	Planted
	<i>Cunninghamia lanceolata</i> Lamb.	Planted
	<i>Taxodium distichum</i> (L.) Rich	Planted
<b>Ephedraceae</b>	<i>Ephedra gerardiana</i> Wall. ex Stapf	Main Himalaya (1950-4200m.), bordering Tibet around Gaumakh.
	<i>Ephedra pachyclada</i> Boiss	Garhwal west wards. ascending to 4650m.
	<i>Ephedra saxatilis</i> (Stapf) Royle ex Florin	<i>S.l.</i>

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