

## Cedar wood

*Cedrus deodara* is one of 11 commonly accepted genera in Pinaceae. It is first described by Trew in 1757. It comprises four species.

- ▶ ***Cedrus deodara***
- ▶ ***Cedrus libani***
- ▶ ***Cedrus brevifolia***
- ▶ ***Cedrus atlantica***

### Plant description:

- ▶ It is a large evergreen tree
- ▶ 40–50 m tall It has a conic crown with level branches and drooping branchlets.
- ▶ ***Bark:*** Dark grey
- ▶ ***Leaves shape:*** Needle-like
- ▶ ***Foliage colour:*** Bluish green
- ▶ ***Flowers:*** Catkins male, cones female
- ▶ ***Flowers colour:*** Reddish brown

### Botanical description:

<b>Kingdom:</b>	Plantae
<b>Division:</b>	Pinophyta
<b>Class:</b>	Pinopsida
<b>Order:</b>	Pinales
<b>Family:</b>	Pinaceae
<b>Genus:</b>	<i>Cedrus</i>
<b>Species:</b>	<i>C. deodara</i>

### Botanical name:

*Cedrus deodara*

### Common names:

- ▶ **Latin-** Cedrus deodara
- ▶ **English-** deodar, Himalayan cedar
- ▶ **Hindi-** devdaar, diar, diyar
- ▶ **Urdu-**deodar , diyar

## Habitat:

They are native to the mountains to:

- ▶ western Himalayas in East Afghanistan
- ▶ Pakistan (kPK)
- ▶ India ( Kashmir, himachal Pradesh etc.)
- ▶ Nepal
- ▶ USA (redcedar) etc.
- ▶ Virginia
- ▶ Texas
- ▶ Mediterranean regions.

## Cultivation:

It is widely grown as an ornamental tree, often planted in parks and large gardens.

The traditional time to plant a nursery deodar sapling is in early spring. As in winter there is no new growth occurs and sapling should be harden enough so that there should be no chance of damage from frost. Frost will harm sapling only if they cultivate very late in the spring.

## Constituent:

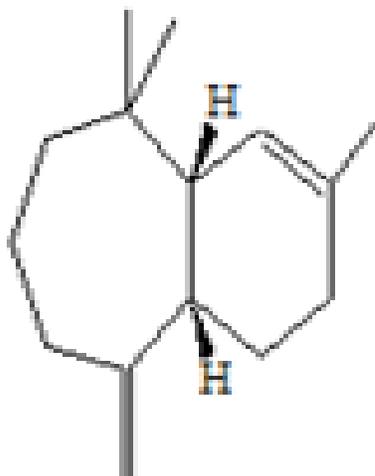
### The Qualitative phytochemical screening:

Phytochemical screening indicated that the Aq. and Alc. extracts of the powdered Cedrus deodara containing tannins, flavonoids, alkaloids, and terpenoids *Jain S et al.(2014)*.

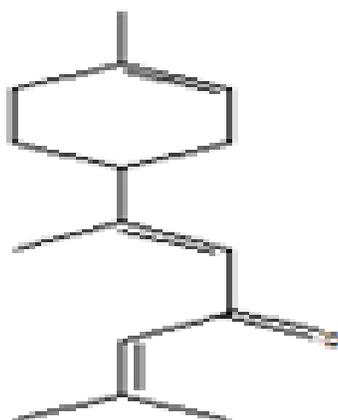
There are about forty components identified by using GC and GS-MS analysis in Cedrus deodara.

The major constituents includes

- ❑  $\alpha$ ,  $\beta$ ,  $\gamma$ -Himachalene
- ❑ (Z)- $\gamma$ -atlantone, (E)- $\gamma$ -atlantone, (Z)- $\alpha$ -atlantone and (E)- $\alpha$ -atlantones *Chaudhary Abha et al. (2011)*
- ❑ Pentane                      Acetonitrile                      Himachalol *Kumar S et al.(2019)*



Alfa himachalene



(E) alpha alanton

### Traditional uses:

- The ancient Egyptians mostly use cedar oil for embalming purposes.
- cosmetics and perfume
- Today insect repellents contain Cedarwood Oil as an active ingredient
- Inner wood is distilled into essential oil.
- The essential oil is used as insect repellent on the feet of horses, cattle and camels.
- It also has antifungal properties and has some potential for control of fungal deterioration of spices during storage.
- The outer bark and stem are astringent.
- Cedar oil is often used for its aromatic properties, especially in aromatherapy

### Development and researches:

#### Antifungal activity:

Studies have carried out to investigate the antifungal activity of Cedrus deodara root oil against *Candida albicans* and *Aspergillus fumigatus*. Cedrus deodara oil constituent himachalol at the concentration of 150 µg/disc showed zone of inhibition against *A. fumigatus* *Ahmad M et al.(2010)*

#### Antibacterial activity:

Antimicrobial activities of *C. deodara* oil was evaluated by

well and disc diffusion methods and erythromycin was used as a positive control. Results revealed that *C. deodara* oil exhibit excellent inhibitory effects against

- ▶ **E. coli** showed 32mm and 24mm and erythromycin 19mm zone of inhibition

- ▶ **S. typhimurium** showed 19mm and 14mm and erythromycin 18mm zone of inhibition,
- ▶ **P. aeruginosa** showed 19mm and 16mm and erythromycin 15mm zone of inhibition
- ▶ **E. faecalis** showed 20mm and 18mm and erythromycin 12mm zone of inhibition
- ▶ **B. subtilis** showed 25mm and 13mm and erythromycin 20mm zone of inhibition with well and disc diffusion method respectively *Gupta Set al. (2011)*

### **Insecticidal activity:**

Himalayan cedarwood oil show insecticidal property against adult Indian mosquitoes, Anopheles slephensis, at low conc.

Chromatographic fractions of Himalayan Cedarwood oil were bioassayed against the Pulse beetle (*Callosobruchus analis* F.) and housefly (*Mucus domestica* L.). Almost all fractions showed insecticidal activity against both the test species *Singh d & Aggarwal SK (1988)*

### **Anti-tubercular activity:**

Chloroform and acetone extract obtained from the leaf and cone part of plant shows good anti-tubercular activity caused by mycobacterium tuberculosis. Cone showed 13 and 14mm zone of inhibition and leaf exhibited 12 and 14mm of inhibition respectively *Gupta Set al. (2011)*

### **Antispasmodic Activity:**

Himachalol is one of the major constituent of wood of plant, which is having antispasmodic activity. The pharmacological studies of himachalol on various isolated smooth muscles (rat uterus, guinea pig seminal vesicle, and guinea pig ileum and rabbit jejunum) and against different agonists (acetylcholine, histamine, serotonin, nicotine, and barium chloride) indicated spasmolytic activity similar to that of papaverine

*Gupta Set al. (2011)*

### **Wound healing property:**

As cedar oil has been reported to possess anti-inflammatory and anti-microbial activities. The plant has also shown wound healing properties and is particularly useful in infective wounds *Dikshit A et al. (1982)*

### **Anti-malarial activity:**

Essential oil from *C. deodara* was evaluated for bioactivity against the adults of *Culex quinuefasciatus* and *Aedes aegypti*

Wood chips of plant were used to obtain essential oil. Adults of *A. aegypti* were insensitive towards the oil of *C. deodara* under the conc. range and 1hr of exposure. Plant shows moderate activity against these two mosquitos *Gupta Set al. (2011)*

### **Toxicology profile:**

GC-Mass analysis and spectral studies were done on root oil of *Cedrus deodara*. This oil is being used orally as anti-ulcer by quaks. Mammalian toxicity was determined, by oral administration, against albino rats (Wister strain). The LD50 by probit mortality graph was found to be 34.4 gm/kg and this is quite safe as compared to Neem oil LD50 (5gm/kg) *Gupta Set al. (2011)*

## References:

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2. Dikshit A, Dixit SN: Cedrus oil – a promising anti-fungal agent. Indian Perfumer. 1982; 26: 216-227
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5. Singh D and Aggarwal SK: *Insecticidal principles of Himalayan Cedar Wood Oil*., JCR, 1988; **14**:1145-1151
6. The Ayurvedic Pharmacopoeia of India, Ministry of health and family welfare Ed.-I., New Delhi, 2004; **1**(4): 23-34