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**REVIEW ARTICLE**

# TIMBER WOOD TREE SPECIES IN THE FLORA OF JAMMU AND KASHMIR, INDIA

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**ABSTRACT**

The geographical location of the state of Jammu and Kashmir supports a rich floral diversity including tree diversity. The timber requirements are met by various species of trees including both the Gymnosperms and Angiosperms. A timber yielding tree attains maturity in hundreds of years but their rapid loss for one reason or the other cannot maintain a balance in nature. As such it adversely affects the forests and thus results in the fragile nature of ecology. All the species mentioned and described in the study are found in wild state. A total of 42 species of trees belonging to 23 families of Gymnosperms and Angiosperms have been enlisted and described. However, some species are also cultivated both by villagers and government agencies. This practice coupled with a shift to substitute the use of traditional wood to the popular synthetic materials may also change the ecological scenario in the state.



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## INTRODUCTION

The area of research is the state of Jammu and Kashmir which is located in the North-Western part of Indian Republic holding a central position in Asia. It occupies about 6.74 percent of total area of the country. The state comprises three different geographical as well as administrative regions namely Jammu, Kashmir and Ladakh. The recorded forest area is 20230 Sq. Kms which constitutes 20 percent of total geographical area. The forests are largely distributed in Kashmir valley and Jammu region. Both Leh and Kargil areas of Ladakh region are devoid of forest vegetation as the region is a cold desert. The climate of the region excluding Ladakh desert area supports a rich plant growth and diversity. The rich flora of Jammu and Kashmir has often been subjected to degradation due to a number of causes. One of the threats to the biodiversity of the region is deforestation. Deforestation primarily for the timber resources results in ecological imbalance. The timber requirements are met by many species of trees including both Gymnosperms and Angiosperms. A timber yielding tree attains maturity in hundreds of years but their rapid loss for one reason or the other cannot maintain a balance in nature. As such it adversely affects the forests and thus results in the fragile nature of ecology. The aim of the study is to document the timber producing plant species in the area of study.

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The present study was performed between 2012 and 2016 with the aim to gain some knowledge about the major timber resources of the state and main causes of deforestation and sustainable development.

### Tools and Techniques

The equipments and related materials employed in the study include microscope, Dissection microscope, camera lucida, Photographic camera, magnifying lens, plant press, cutters, field note-book and polythene bags. The author has conducted many random field trips in the area of research. The plant specimens were photographed, collected and brought back, pressed and preserved for further reference. All the species mentioned and described in the study are found in wild state. The plant specimens were identified by applying taxonomic keys and reference to the local floras. The identification was facilitated by way of consultations with experts in the field of taxonomy and final confirmation from the local herbaria. The common names of the plants were ascertained by way of investigations from the elderly men in the vicinity. The plant specimens and photographs of species explored during the course of study were kept for record in nearest concerned institution.

## RESULTS

- **Cedrus deodara** (Roxb) G.Don. ; The Himalayan Cedar ; Vern. *Devdar*, Family- Pinaceae. A tall gregarious tree with

horizontal branches and branchlets forming typical conical crown. Deodar wood is one of the strongest woods in India. The heartwood is fine and close grained, aromatic, rot and termite resistant and durable. It is used for construction and building, boat houses, doors, furniture, wooden carvings..

- **Dalbergia sissoo** Roxb.; Indian Dalbergia, Indian Rosewood; Vern. *Tahli*; Family- Fabaceae. A middle-sized deciduous tree present in the plains and subtropical regions. The heartwood is brown, mottled with dark longitudinal veins, hard and close-grained. It is highly esteemed for all purposes where strength and durability are required. It is used for making furniture, construction and agricultural implements.
- **Platanus orientalis L.;** Oriental Plane, Vern. *Chinar*; Family- Platanaceae. A large deciduous tree commonly seen in Kashmir valley. The sapwood is white to light tan while the heartwood dark reddish brown which is fine and even textured and moderately hard. The wood is used for construction, plywood and board, cabinet making, furniture and general turnery.
- **Juglans regia** Linn.; Walnut; Hindi *Akhrot* ; Vern. *Khoad*; Family- Juglandaceae. A large aromatic deciduous tree with velvety shoots and grey bark which is longitudinally fissured. The wood is grayish-brown with dark streaks, often mottled and moderately hard. It is in great demand for making furniture, cabinet making and wood carvings in Kashmir.
- **Toona cilliata** M. Roem.; Red cedar; Vern. *Toon, Tooni*; Family- Meliaceae. A large tree with dense spreading crown and thin dark-grey bark which is smooth upto the middle age. The wood is light-red coloured, open-grained and durable. It is of common use for house building, furniture, doors, cabinets and wooden articles.
- **Albizia chinensis** Durazz.; Persian acacia; Vern. *Ola*, *Sanura*; Family- Fabaceae. A large deciduous tree with smooth grey warty bark. The heartwood is reddish-brown, moderately hard and less durable but finds a number of uses including construction.
- **Melia azedarach** Linn.; The Persian Lilac; Vern. *Draink*; Family- Meliaceae. A moderate-sized tree with smooth dark grey bark common in the plains and subtropical regions. The wood is reddish-brown and often used in furniture.
- **Bombax ceiba** L.; Silk Cotton Tree, Vern. Name- *Simbal*; Family-Bombacaceae. A large deciduous tree commonly seen in the Shiwaliks. The stem is straight, covered with large conical prickles when young. The wood is light, even grained, moderate in strength and largely used for construction and plywood making.
- **Mangifera indica** L.; Mango, Vern. *Amb* ; Family-Anacardiaceae. A large evergreen tree with rough thick dark-grey bark. The wood grey, coarse-grained soft and liable to attacks of insects. It is made into planks and other articles where durability is not required.
- **Bauhinia variegata** L. Mountain ebony; Vern. *Krael*; Family- Fabaceae. A fairly large tree with 4-6 in. long leaves, deeply cordate, cleft about a quarter and lobes obtuse. The wood is grey, moderately hard. It is used for agricultural implements and in construction.
- **Grewia optiva** J.R.Drumm.; Phalsa, Vernacular Name- *Dhaman*; Family- Tiliaceae. It is small to medium-sized tree with grey bark and crooked branches. The wood is grey, tough, elastic, hard and close-grained. It is used for the making of furniture and agricultural implements.
- **Acacia nilotica** L. ; Egyptian thorn; Vern. *Kikar*; Family-Fabaceae. A moderate-sized tree with large spreading crown and dark- brown fissured bark. Sapwood is whitish whereas heartwood is dark-brown and is hard and durable. It is used for making furniture, ploughs and other agricultural implements.
- **Acacia catechu** Willd.; Catechu, Black Cutch; Vern. *Khair;* Family- Fabaceae. A small deciduous spiny tree with deeply cracked brown bark. The heartwood is dark-red and very durable. It is also used to extract catechin or *Katha* and cutch of commerce.
- **Aesculus indica** (Colebr. Ex Cambess.) Hook.; Horse Chestnut; Vern. Name *Singla*; Family- Hippocastanaceae. A large deciduous tree with distinct long-stalked palmate leaves. The wood is used for house building, furniture and agricultural implements.
- **Pistacia chinensis** subspecies ***integerrima*** Stew. ; East Indian Mastiche; Hindi *Kakra*; Vern. *Kakarsinghi*; Family-Anacardiaceae. A middle-sized deciduous tree with rough grey and thin bark. The heartwood is mottled with yellow and green streaks, very hard and durable. It is used for various purposes like construction, furniture and cabinet making.
- **Quercus leucotrichophora** A.Camus; Grey Oak; Vern. *Banj*; Family-Fagaceae. A medium-sized evergreen tree having dark-grey and rough bark. The wood is reddish-brown, very hard although wraps and splits on seasoning but used extensively for various other purposes including ploughs and agricultural implements.
- **Quercus semicarpifolia** Smith; Brown Oak Vern. *Khrew*; Family- Fagaceae. A middle-sized evergreen tree with dark-grey bark. The wood reddish-grey, very hard and used locally for house building, doors and agricultural implements.
- **Morus alba** Linn.; Mulberry; Hindi *Shahtoot*; Vern. *Toot*; Family- Moraceae. A middle-sized deciduous tree with pubescent shoots. The wood is fine and close-grained and useful in making furniture and agricultural implements.
- **Terminalia bellirica** Roxb.; Belleric Myrobalan; Vern. *Bahera*; Family- Combretaceae. A large deciduous tree with bluish or ash-grey bark common in the plains. The wood is light-grey, hard and course-grained, not durable but used in construction purposes.
- **Syzygium cumini** L.; Java Plum; Hindi *Jamun*; Vern. *Jumman*; Family- Myrtaceae. The plant species which is a medium-sized tree. The heartwood is reddish-brown, tough and hard, less durable but used for building and agricultural implements.
- **Populus nigra L.;** Black Popular, Vern. *Safeda*; Family-Salicaceae. A tall columnar deciduous of temperate regions. The wood is soft fine textured and almost white. It is mainly used for making packing boxes and in plywood industry.
- **Populus deltoides** W. Bartram ex Humphry Marshal ; Eastern Cottonwood, Carolina Poplar; Vern. *pahari-safeda*; Family- Salicaceae. A medium-sized deciduous tree having grey bark with vertical fissures. The wood is white, soft and less durable. It is generally used as a raw material for plywood industry
- **Moringa oleifera** Lamk.; Drum Stick Tree; Vern. *Suhanjana*; Family-Moringaceae. A medium sized deciduous tree with thick corky bark. The wood is whitish, moderately hard and used mainly for construction purposes.

- **Mitragyna parviflora** Korth**. ;** Vern. *Sangla*; Hindi *Kaim*; Family- Rubiaceae. A large deciduous tree with pale grey or yellowish flaking bark. The wood is used for construction and agricultural implements.
- **Celtis tetrandra** Roxb.; Eastern Nettle tree Vern. *Kharak*; Family- Urticaceae. A large deciduous tree with smooth grey bark. The wood is yellow-grey, even-grained, splits but useful in construction and other purposes where durability is not required.
- **Neolitsea umbrosa** (Nees.) Gamble**.** ; Vern. *Singla* ; Family- Lauraceae. A moderate-sized evergreen tree with a spreading crown and dark-brown bark. The wood is dark, moderately hard but used for house-building in hill regions.
- **Litsea glutinosa** (Lour.) C.B Rob**.** ; Vern. *Riyan*; Family- Lauraceae. A moderate-sized tree with grey soft corky bark, young parts grey-tomentose. The wood is moderately hard and used for building purposes.
- **Holoptelea integrifolia** Planch.; Indian elm; Vern. *chamar* ; Family- Urticaceae. A large deciduous tree having grey bark with an offensive smell when freshly cut. The wood is yellowish-grey, moderately hard and used for building and agricultural implements.
- **Sapindus mukorossi** Gaertn. ; Soap nut; Hindi *Reetha* ; Family- Sapindaceae. A handsome tree resembling the Tun (*Toona ciliata)* with grey bark. The wood is used for construction purposes.
- **Salix heterophylla** Hort. Ex Lavallee**.** ; Vern. *Badhaa* ; Family- Salicaceae.A small tree with greenish-grey bark. The wood is white, soft, close-grained and used for furniture making.
- ***Robinia pseudo-acacia*** L**.** ; Vern. *Pahari-kikar* ; Family- Fabaceae. A small deciduous tree with deep longitudinally fissured bark and grows in high altitude areas of the state. The wood is used for house building.
- **Ulmus villosa** Brandis; Elm; Hindi *Upkar*; Vern. *Maraal*; Family- Ulmaceae. It is a medium-sized tree of subtropical regions. The wood is grayish-brown, fine-grained, moderately hard and used for house building.
- **Alnus nitida** Endl.; Alder Tree; Vern. *Prak* ; Family- Betulaceae. A large tree with dark brown and deeply furrowed bark. The wood reddish-white, close and even-grained, soft but tough and used in house making in the hills.
- **Eucalyptus tereticornis** Sm.**;** Eucalyptus; Vern. Safeda; Family- Myrtaceae. An introduced tall tree with thin grey bark. The wood is light brown, soft, close- grained and used for construction, furniture, planks, poles, agricultural implements.
- **Ficus virens** Aiton.; Java fig; Hindi *Pilkhan*; Vern. *Plakh* ; Family- Moraceae. A large tree with greenish-grey smooth bark. The wood is grey, moderately hard but less durable. It less commonly used for construction purposes.
- **Pyrus pashia** Ham. ; Elephant apple, Vern. *Kainth*, Family- Rosaceae. A moderate-sized deciduous tree commonly seen in Shiwaliks. The wood is brown, compact, fine-grained and durable. It is more commonly used for making agricultural implements and less for construction purposes.
- **Lannea coromandelica** Merr**.** ; Jhingan Vern.: *Kembl* ; Family- Anacardiaceae. A moderate deciduous tree with thick soft branchlets and grey bark. The wood is moderately hard and close-grained but not durable. It is used for making planks and other articles where durability is not required.
- **Abies pindrow** Royle. ; West Himalayan Silver Fir, Vern. *Raan;* Family- Pinaceae. A tall evergreen tree.Leaves 4-8 cm. dark green with 2 silvery lines beneath. Branches are horizontal. The wood is used for construction purposes.
- **Pinus roxburghii** Sargent.; Long leaved Pine; Vern. *Cheer*; Family- Pinaceae. A large tree with a clear straight bole and bark about 2 in. thick, outer corky and in thin crisp plates, inner brick-red. The wood is largely used for construction and other purposes where durability is not required.
- **Pinus wallichiana** A.B.Jackson.: Himalayan Blue Pine; Hindi *Kail* ;Vern. *Kail* ; Family- Pinaceae. A tall pyramidal tree with smooth, slate-grey bark which becomes rough and shallow fissured on maturity. The wood is highly resinous and used for local construction.
- **Picea smithiana** (Wallich) Boiss**.**; West Himalayan Spruce; Hindi- *Prasaral* Vern. *Toss* ; Family- Pinaceae. A lofty tree with rough grayish-white bark exfoliating in thin orbicular scales and horizontal branches. The wood is used for planks, boxes and construction purposes.
- **Taxus wallichiana** Pilger.; Himalayan Yew; Vern. *Brhammi*; Family-Taxaceae. A medium size conifer prefers cool and shady places in forests. It grows in high altitude regions and getting rare in the habitat. The wood is used for house building.

## DISCUSSION

The entire state has a rich floral diversity. But the ever increasing population has been creating more pressure on the increasing demand of timber requirements which has partially been substituted by materials of synthetic or other nature. Many timber tree species have been used by the people for different requirements like construction of houses, door making, furniture, agricultural implements, wooden articles, almirahs, cabinets, wood carvings etc. Besides, the raw material to the plywood industry is also catered by the species. A total of 42 species of trees belonging to 23 families of both Gymnosperms and Angiosperms have been enlisted and described. Pinaceae and Fabaceae are the two dominant families in this regard. The increased population, forest fires and over-exploitation of the valuable resource coupled with habitat destruction for development and other activities has its impact on the rarity of plants. However, the some villagers as well as some government agencies have been found in the cultivation of timber yielding trees across the region which reduces the burgeoning burden on forest resource. Although there are strict measures to check the cutting of trees yet some people are seen flaunting the rules. A shift to substitute the traditional use wood to the popularization of other materials like plywood, glass and synthetic may improve the state of forests across the region. Conservation measures may be adapted for those species which in one way or other facing the threat of extinction in near future.

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