

Need and Importance of Conservation of Endangered Tree *Oroxylum indicum* (Linn.) Vent.

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ABSTRACT

Oroxylum indicum is a well-known medicinal tree in Asia, belongs to family Bignoniaceae, commonly known as Shivnak, Shyonak, Sonpatha or midnight horror, possesses economic as well as medicinal importance. The tree was distributed throughout the great parts of India but now it is listed amongst endangered species in many areas in the country. Many medicinal plants are also in trouble from over harvesting and destruction of habitat. Population growth, urbanization and the unrestricted collection of medicinal plants from the wild is resulting in an over-exploitation of natural resources. Hence there is an urgent need for its conservation is required.

Keywords: *Oroxylum indicum*, Sonpatha, Endangered, Medicinal Plants, Conservation.

INTRODUCTION

India is endowed with rich and diverse forest resources. Deforestation has resulted in a serious damage to biodiversity and gene resources [Nayar and Sastry, 1987]. *Oroxylum indicum* tree is a native tree often grown as an ornamental for its strange appearance; it was distributed throughout the country up to an altitude of 1200m and found mainly in ravine and moist places in the forests [BenNETT *et al.*, 1992]. Owing to the indiscriminate collection, over exploitation and uprooting of whole plants bearing roots, this valuable tree has become vulnerable in Karnataka and Andhra Pradesh and endangered in Kerala, Maharashtra, M.P. and Chhatisgarh [Darshan and Ved, 2003; Jayram and Prasad, 2008] and is feared to become endangered soon in other states too.

It is an evergreen or partly deciduous tree to 5-10 m tall, and 15-20 cm in DBH. Young trees have a single stem and leaves are clustered at the top, making it look like a palm. The bark is thin grey-brown. The compound leaves are 60-170 cm long, with triangular-oval leaflets to 5 cm-13 cm long and 3-10 cm wide. The individual leaflets are 5-20 mm long and turn blue after drying. Inflorescences are cluster of flowers, 40-150 cm long, directed upwards from the tree crown. The funnel-shaped, fleshy and thick flowers, which open at night and have a bad smell, are 3-9 cm long and 1-10 cm wide. They have five wrinkled lobes and a light-yellow or red-purple colour. The fruit capsules grow upwards like the inflorescences and are dark-brown, linear and flat, 40-120 cm long, 5-9 cm wide, and 1 cm thick. The many white seeds are rounded and flat with a papery wing enclosing the 4-8 cm x 3-5 cm.

The tree is propagated naturally by seeds, which germinate in the beginning of the rainy season. Seedlings require moderate shade in the early stages. However, the seed set is poor and seed viability is low. Problems related with its natural propagation and indiscriminate exploitation for medicinal purpose has pushed *O. indicum* to the list of endangered plant species of India. Destructive and non-sustainable collection methods coupled with low regeneration and habitat destruction have posed serious threat to the survival and availability of this highly useful tree [Yasodha *et al.*, 2004]. Mishra and Kotwal, [2010], also found that due to overexploitation several valuable medicinal plants are becoming rare in their natural habitat. Mishra [2011], also found that besides over harvesting

(unscientific collection of underground part of medicinal use), several other regions of threats are – habitat destruction, over grazing, deforestation and fire. This is an attempt to reestablish the glory of this valuable asset amongst all concerned.

Current status of biodiversity of important medicinal plants in India:

According to the Red list of Threatened Plants [UNEP, 1995], 19 species are already extinct and 1236 species are threatened. Of these, threatened 41 taxa are possibly extinct in the wild, 152 are endangered, 102 are vulnerable, 251 are rare, and 690 are indeterminate [D Ramprasad *et al.*, 2012]. Many medicinal plants are also in trouble from over harvesting and destruction of habitat. Population growth, urbanization and the unrestricted collection of medicinal plants from the wild is resulting in an over-exploitation of natural resources. In India, of the 17,000 species of higher plants, 7500 are known for medicinal uses [Shiva MP, 1998]. This proportion of medicinal plants is the highest proportion of plants known for their medical purposes in any country of the world for the existing flora of that respective country. Ayurveda, the oldest medical system in Indian sub-continent, has alone reported approximately 2000 medicinal plant species, followed by Siddha and Unani. The Charak and Samhita, an age-old written document on herbal therapy, reports on the production of 340 herbal drugs and their indigenous uses [Prajapati, *et al.*, 2003]. Currently, approximately 25% of drugs are derived from plants, and many others are synthetic analogues built on prototype compounds isolated from plant species in modern pharmacopoeia [Rao MR, *et al.*, 2004].

The northern part of India harbours a great diversity of medicinal plants because of the majestic Himalayan range. So far about 8000 species of angiosperms, 44 species of gymnosperms and 600 species of pteridophytes have been reported in the Indian Himalaya [Singh and Hajra 1996], of these 1748 species are known as medicinal plants [Samant SS, *et al.*, 1998]. The maximum medicinal plants [1717 species] have been reported around the 1800 m elevation range. On the regional scale, the maximum species of medicinal plants have been reported from Uttarakhand [Kala CP, 2004], followed by Sikkim and North Bengal. The trans-Himalaya sustains about 337 species of medicinal plants [Kala CP, 2002], which is low compared to other areas of the Himalaya due to the distinct geography and ecological marginal conditions [Kala and Mathur, 2002].

Several plant species are endemic to the Himalayan region. Out of total known number of higher plants from India, approximately 46% are endemic to the Himalaya. Of the total medicinal plant species, sixty-two species of medicinal plants are endemic to the Himalaya and 208 extend their distribution to the adjacent areas, and are therefore classified as near endemic [Chatterjee D, 1939]. Over 200 species of Himalayan medicinal plants are consumed raw, roasted, boiled, fried, cooked, or they are used in the form of oil, spices, jams or pickles. The indigenous communities use some medicinal plant species as a source of food, fodder, timber as well as various other ethnobotanical purposes [Dhyani and Dhar 1994]. Approximately 81 species of Himalayan medicinal plants are known to be used for the extraction of oil. Of the total 675 species of Himalayan wild edibles, 171 are used for the treatment of diseases [Samant SS, *et al.*, 2001]. The crop plants diversity is also a source of traditional medicine [Arora and Nayar 1984].

Sixty percent of the world population and 80% of the population in developing countries rely on traditional medicine, mostly plant drugs, for their primary health care needs [Shrestha and Dhillon 2003]. Many of the plant materials used in traditional medicine are readily available in rural areas at relatively cheaper than modern medicine. Plants generally produce many secondary metabolites which constitute an important source of microbicides, pesticides and many pharmaceutical drugs. Plant products still remain the principal source of pharmaceutical agents used in traditional medicine [Ibrahim, 1997, Mahalingam, R. *et al.*, 2001]. An account of 70% of the population of India [Gadgil and Rao, 1998], 80% of Pakistan [Ahmad and Ghafoor 2002] and 80% of Nepal are dependent on traditional plant based medicines [Kunwar, R.M. *et al.*, 2006].

Utilization of *Oroxylum indicum*:

It is widely used for multiple purposes and its medicinal importance has been recognized by Ayurveda for centuries. Although almost all parts of this tree possess medicinal value. Dichloromethane extract of stem bark and root possesses antimicrobial, antifungal, anti-inflammatory and anti-cancerous properties [Ali RM, *et al.*, 1998]. Root bark of the plant is an astringent used in diarrhea, dysentery, rheumatism and otorrhoea as it contains ellagic acid [Rastogi and Mehrotra, 1998]. Stem bark past contains oxoylin A, chrysin, tannic acid, scutellarein-7-rutinoside and is applied for the cure of scabies and to treat arthritis. Leaves contain baicalein-7-glucuronide. Leaf decoction is given in treating stomachache, rheumatism, enlarged spleen [Pal and Jain 1998]. Mature fruits of the tree are used in treating cough, bronchitis, jaundice, piles, smallpox, dyspepsia, colic, leucoderma, pharyngodymia, cardiac disorder, helminthiasis, gastropathy, hemorrhoids and cholera [Indian Medicinal Plants, 1995]. Seeds of this species are used

as purgative. They contain a flavone glucuronide-oxindin, bacicalein-6-glucuronide and baicalein-7-glucuronide, baicalein 7-O- β -gentiobioside, fixed oil [25%] and crude proteins [7.9%] [Grampurohit *et al.*, 1994]. Dried seed powder is used by women to induce conception in ethnic communities. The plant is used in many Ayurvedic Preparations like, *Shyonakapatpak* and *Bruhatpanchamulayadikwath*, *Dashmula* and *Chyawanprash* [Vaidya, 1975].

Young shoots, unripe fruits and flowers of this tree are eaten as vegetable. The tree is lopped for fodder. Seeds yield nondrying oil used in perfumery industry. Wood of tree is used to make match boxes. Stem bark and fruits of the tree are employed as mordant and the stem bark yield a *Khakicolour* dye [Jain SP, *et al.*, 2003].

CONCLUSION

Presently, medicinal plants play a very important role in the modern economy. NTFPs account for 70% of India's forest product exports and the demand for photochemicals is expected to increase in future as a new frontier for trade. India has probably the oldest, richest and most diverse cultural traditions in the use of medicinal plants. Owing to the indiscriminate collection, over exploitation and uprooting of whole plant bearing roots this valuable plant has become vulnerable in various places and endangered in Madhya Pradesh and Chhattisgarh [Ved DK *et al.*, 2003]. Although described in literature as an important medicinal species, this non-wood forest product [NWFP] is for some strange reasons reported to have no routine demand. Some herb traders are reported to supply *Sonpatha* tree parts to some leading pharmaceutical companies and twigs of the tree are traded in Indian as well as international markets. Local healers and local as well as cross border traders are rampantly collecting this species from the wild which is causing a severe threat to its existence in India. Most of this species' industrial requirements for production of different commodities are met through wild collections from forests. Very little effort has been made to conserve this species. Conservation of this species has become an immediate need of the country. If behaviors are not modified, after a couple more years, there will be no species left to conserve. Research for genetically improving the tree species for higher production of compounds under in culture condition is essential [Croteau, *et al.*, 2000]. For the conservation of this species, rapid multiplication and rehabilitation in its natural habitat is necessary. To overcome this threat, a reliable method of quick multiplication like tissue culture and methods of *in-situ* as well as *ex-situ* conservation could well provide a viable solution to the problem.

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