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REVIEW ARTICLE

Cinnamomum tamala: A valuable tree from Himalayas

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Abstract: *Cinnamomum tamala* known as *tejpat* / bay leaves in trade, found in Himalayan region, is a promising medicinal plant species. Its leaves are widely used as spice throughout the world since ancient times. It is used in Indian system of traditional medicines in various *Ayurvedic* formulations. Leaves and bark have aromatic, astringent, stimulant and carminative qualities and used in rheumatism, colic, diarrhea, nausea and vomiting. The essential oil of the leaves called *tejpat* oil is medicinally used as carminative, anti-flatulent, diuretic, and in cardiac disorders. It is also used in pharmaceutical preparations because of its hypoglycemic, stimulant and carminative properties. Owing to its high medicinal value and being an important ingredient of the spices, the demand of *C. tamala* is increasing day by day. Therefore, species has been recommended for *in-situ* as well as *ex-situ* conservation with devising appropriate management plans.

Keywords: Conservation; Himalayas; Medicinal properties; *Cinnamomum tamala*; Tejpat.

The genus *Cinnamomum* belonging to the family *Lauraceae* comprises 270 species which occur naturally in Asia and Australia. They are evergreen trees and shrubs and most species are aromatic and many are economically important. About 20 species occur in India (Anonymous 1950). The etymology is derived from the Greek word 'kinnamomon' (meaning spice). The Greeks borrowed the word from the Phoenicians, indicating that they traded with the East from early times. The specific epithet 'tamala' is after a local name of the plant in India. *Cinnamomum tamala* (Buch.-Ham.) Nees and Ebermaeir (Figure 1) is locally called as *tejpat*/*dalchini* and known as *tejpatra* in Sanskrit (Kirtikar and Basu 1981). It is a medium-sized tree, found in India along the North-Western Himalayas, in Sikkim, Assam, Mizoram and Meghalaya. It is also found in tropical and subtropical Asia, Australia, Pacific region and South Asia (Brandis 1998; Showkat et al. 2004). It is distributed from near Indus to Bhutan (Hooker 1988). This evergreen species occurs as associated species in transitional evergreen broad leaf forest and is confined between sub–montane broad leaf ombrophilous forest (below 1000m) and mid montane broad leaf ombrophilous forest up to 3000m (Singh and Singh 1992). According to Gaur (1999) *C. tamala* commonly occurs on moist-shady ravine slopes, often associated with Oak-Rhododendron forests, from 500m to 2200m altitude in sub-montane and montane Himalaya.

Figure 1. A mature tree of *Cinnamomum tamala*.

It is a perennial or small evergreen tree, attaining 8-12 meters height and a girth of 150 cm. Stem rough with gray-brown, soft wrinkled bark which produces mucilage. Terminal bud

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small, sericeous, 2 bud scales. The leaves are large, 12-20 cm long and 5-8 cm broad, ovate-lanceolate, thick leathery, acuminate, coriaceous, glabrous, shining green above and glaucous beneath, opposite, sub-opposite or alternate and short stalked; the midrib dividing some distance above the base into 3 longitudinal nerves, joined by distinct reticulate veins. Petiole slender, 0.8-1.8 cm long. *C. tamala* has bisexual flowers, but on the same plant (monoecious). Flowers whitish, numerous, small, in axillary cymes and terminal pubescent panicles, pedicels are as long as calyx. The plant produces flowers in last week of March or first week of April commonly pollinated by insects such as honey bees. The fruit is an ellipsoidal drupe and seeds require approximately one year attaining maturity. Therefore, flowers and fruits coexist from April to May. Ripe fruits are dark purple in color and contain single seed (Sharma et al. 2009).

Leaves of *C. tamala* (*tejpat*) are widely used as a spice and also yield an essential oil on distillation. The essential oil of the leaves called *tejpat* oil is medicinally used as carminative, anti-flatulent, diuretic, and in cardiac disorders (Showkat et al. 2004). "*Ayurveda*" describes the use of leaves of *tejpatra* in the treatment of ailments such as anorexia, bladder disorders, dryness of mouth, coryza, diarrhea, nausea and spermatorhea (Kapoor 2000). It has hypoglyacemic and hypolipidemic properties (Kar et al. 2003). It is commonly used in food industry, because of its special aroma (Chang and Cheng 2002). The main constituents of *C. tamala* leaves are *a*-pinene, camphene, myrcene, limonene, eugenol, p-cymene, methyl eugenol, eugenol acetate and methyl ether of eugenol (Smith et al. 2002; Saino et al. 2003). Eugenol (4-hydroxy-3-methoxy allylbenzene) is one of the main constituents of cinnamon oil (Fischer and Dengler 1990; Dighe et al. 2005). Cinnamon bark oil possesses the delicate aroma of the spice and a sweet and pungent taste. Its major constituent is cinnamaldehyde but other minor components impart the characteristic odor and flavor. It is employed in the flavoring industry where it is used in meat and fast food seasonings, sauces and pickles, baked goods, confectionery, cola-type drinks, tobacco flavors and in dental and pharmaceutical preparations (FAO 1995). *Tejpat* has been used as a natural food preservative for pineapple juice (Kapoor et al. 2008).

Its leaves and bark are aromatic and traded as a spice (Anonymous 2006; Dhar et al. 2002; Edwards 1993). Indian bay-leaves (trade name of the species) are closely related to cinnamon. These tough, three-veined leaves are very popular in Northern India, but are little known elsewhere. Its leaves and bark are aromatic and fragrant and therefore it is a common species in trade. It is regarded as carminative and used for treatment of diarrhea and colic pain. In Kashmir it is used as a substitute for betel leaves. The bark of *C. tamala* is coarser than the bark of *C. zeylanicum* and is one of the common adulterants of true *Cinnamon* (Datta and Datta 1955). The essential oil from bark is pale yellow, and contains 70-85% cinnamic aldehyde (Chopra 1933). The leaf oil resembles cinnamon leaf oil and contains d-á-phellandrene and 78% eugenol (Finnemore 1926). *Cinnamomum tamala (tamalapatra)* is one of the three ingredients of *'trijata'* with *Cinnamomum zeylanicum (tavak or dalchini)* and *Elettaria cardamom (elâ)*, mentioned by *Bhavaprakasa*. Trijata is commonly used in *Ayurvedic* pharmacy in *asava* and *arista* preparation to augment the fragrance and to promote the appetite and digestion. It has been reported that crude drug from unripe fruit of *C. tamala* is being sold under the name '*nagkesara*' in different parts of India (Vaidya 1971).

Parts of *C. tamala* are used in many *Ayurvedic* preparations *e.g. sudarshan choorna* and *chandraprabhavati*. The leaf extracts are used as clarifiers in dyeing procedures with myrobalans or kamala. Traditionally green dye has been extracted from its leaves (Gaur 2008). With an evergreen canopy *tejpat* is an important shade provider in its native range. It is used as food, fodder, medicine and timber in Uttarakhand Himalayan region (Nautiyal and Kaechele 2007). Besides its high economic importance, this species provides excellent habitat for a large number of frugivorous birds and small mammals, which facilitate its regeneration in turn (Sharma et al. 2009).

Owing to its high medicinal value and being an important ingredient of the spices the

demand of *C. tamala* is increasing day by day and the species is being exploited from its natural pockets illegally (Sharma and Nautiyal 2009; Samant et al. 2001). Therefore there is a need to raise high quality individuals in large scale to fulfil the increasing demand on the one hand and help in conservation of the species on the other. Although a lot of literature was found about the pharmacological and chemical characteristics of *C. tamala* (cited in above paragraphs) but very few reports regarding physiological (Rawat et al. 2009), micropropagation (Sharma and Nautiyal 2009) and conservation (Sharma et al. 2009) are available till date and need further research.

In view of the wide range of its uses the species is harvested from the wild under different systems of regulations that vary with the states. This has put great pressure on the natural resources of the species (Sharma et al. 2009). In addition, degradation in the natural habitat areas of the species owing to a variety of reasons, similar to many other forest tree species, has also contributed to the threats to the species. Some threats to the species were identified by Ved et al. (2003) in Himalayan states of India. According to this report *C. tamala* has been found vulnerable in Uttarakhand, Himachal Pradesh, Arunachal Pradesh and Meghalaya and endangered in J&K on the basis of identified threats *i.e.* population reduction due to habitat loss and harvest. Considering the economic potential and dwindling natural populations of *C. tamala* in several ranges, this species has been recommended for *in-situ* as well as *ex-situ* conservation earlier (Samant et al. 2001). This calls for conservation of the species devising appropriate strategies.

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