*Northeast Journal of Contemporary Research*, November 2016. Vol. 3 No. 1, pp 1-6
ISSN 2349-3089 ©NeJCR, 2016

# Taxonomic Diversity and Utilitarian Aspects of Tejpat Spice

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**ABSTRACT**

*Cinnamomum tamala* Nees & Ebrem - the genuine source 'tejpat spice of commerce', is over-viewed in the present communication in context of its 'taxonomic aspects' like infraspecific categories, other sources of tejpat-if any, tejpat vs. bay leaves, and 'utilitarian aspects' like medicinal values & other utilitarian aspects, smaller the leaf size better the quality of tejpat spice, cultivation/propagation technique & processing, marketing, and 'other aspects' like insect pests of tejpat-if any, diseases of tejpat and their management, and related aspects & properties of tejpat.

**Key Words:** Tejpat spice, *Cinnamomum tamala*, Allied taxa, Taxonomic and Utilitarian aspects.

## INTRODUCTION

'Tejpat' is a kind of leafy spice obtained from a number of tree species belonging to the genus *Cinnamomum* Schaeffer under the family Lauraceae, of which *C. tamala* Nees & Ebrem is the genuine source **(Figure 1).** However, the bark of *C. tamala* is also used as one of the sources of cinnamon spice. The inner dried bark of *C. verum* Presl. is the genuine source of cinnamon and known in trade as 'True or Ceylon Cinnamon'. The bark of *C. tamala* is known in trade as 'Indian Cassia Lignea' or 'Indian Cassia Bark' while it is known as 'tejpat' as regards the use of its leaves as spice. *C. tamala,* although considered as a source of cinnamon spice, it is rather used mainly as a source of tejpat leaf spice which is being used widely in India from time immemorial. The barks of *C. tamala* are coarser than the bark of true cinnamon (*C. verum*) and inferior in quality. It is used as one of the common adulterants of true cinnamon (Baruah, 1998).

Dry leaves of *C. tamala* on the other hand, is, known in trade, as the 'tejpat leaf spice of commerce' and is recognized by International Organization for Standardization (IOS), Budapest Hungary, as a spice. The characteristic warm, powerful taste and smell like 'clove oil' of *C. tamala* leaf is due to the presence of an alcohol soluble essential oil where eugenol (up-to 78%) is commonly found as the main active ingredient.

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**Figure 1.** The genuine source of Tejpat (*Cinnamomum tamala*)

*C. tamala* is found mostly in India, Nepal, Bhutan, Burma and Bangladesh. In India, besides being the natural occurrence, *C. tamala* is found under cultivation mainly in the states of Northeast India including Sikkim and Pachim Banga.

**Vernacular names of Tejpat:** Tejpat is known in India by different names in different languages viz. in Assamese, Bengali and Punjabi as Tejpat, Gujarati as Tamalapatra, Hindi as Tejpat / Tajpat or Taj-kalam, Sanskrit as Tejapatra / Tamalapatra or Tamalaka, Tamil as Perialavangapallai / Perialavangapattai or Talishappattiri, Telegu as Talispatri, etc, while in abroad by different names viz. in Arabic as 'Sazaj hindi', Burmese as Thitchubo, France as Cannelle, German as Zimtbaum, Japanese as Tamara Nikkei, Singhalese as Tejpatra, etc. (Baruah, 2011).

## TAXONOMIC DIVERSITY OF TEJPAT SPICE IN NORTHEAST INDIA

A total of eight different taxa of *Cinnamomum* belongs to four distinct species namely – *C. tamala* Nees. with five variants, *C. impressinervium* Meissn., *C. champokianum* Baruah & Nath and *C. sulphuratum* Nees are used as 'tejpat' spice in Northeast India (Baruah & Nath, 2004, 2015). The leaves of *C. impressinervium* are locally known in Dima Hasau District of Assam as 'Best Quality Tejpat' **(Figure 2)**. This best quality tejpat spice are generally mixed with the genuine source (*C. tamala*) and sold in the local markets in the name (Baruah 2011, Baruah & Nath 2001, Baruah *et al.* 2000).

**Figure 2.** The Best Quality Tejpat (*Cinnamomum impressinervium*)

**Tejpat vs. Bay Leaves:** The leaves of *C. tamala*, which are known as tejpat, take in Indian cookery as spice the place of 'Bay leaves' (*Laurus nobilis* Linn., **Figure 3**) of Europe. *L. nobilis* is a plant which also belonging to the family Lauraceae likes that of 'Tejpat' or 'Indian Cassia Leaves' (*Cinnamomum tamala*). It has been seen in most of the Indian books and even the Academic syllabi of most of the Indian Universities that *C. tamala* plant is wrongly interpreted by the name 'Bay leaves'. To break the confusion about the common names of these two distinct plant species - Tejpat should be written as '**Indian Bay leaf'**, while Bay leaves

otherwise may be called as '**European Tejpat'** (Baruah, 2011).

'Bay leaves' also called 'Laural leaves' or 'Sweet Bay' or "True Laural' are the dried leaves of *Laurus nobilis.* They grow in Mediterranean countries and are cultivated in Greece, Spain, Portugal and Central Ameica. It is sometimes grown in Indian gardens but it does not seem to thrive well. Laural/Bay leaves are used whole or cracked. There is one more plant known as 'Bay Laural' (*Umbellularia californica* Nutt., Family – Lauraceae) which is often confused with 'Bay or Laural leaves'. This plant is native to California.

The upper surfaces of the Bay leaves are green while their lower surfaces pale green or somewhat yellowish. Leaves elliptic, and size variable ranging from 2.5 – 7.5cm in length and 1.6 – 2.5cm in breadth. Dried berries of the tree commonly called 'Bay berries' have been imported into India for medicinal use. The berry is ovoid and 1.5cm long, black, coarsely

**Figure 3.** Bay Leaf or European Tejpat (*Laurus nobilis*)

The Bay leaves yield 1 – 3% essential oil with a characteristic sweet and spicy camphoraceous odour. The oil is colourless and with a cooling taste. The principle constituent of the oil is 1, 8 – cineole (up-to 50%). The other components present in the oil are α – pinene, α – Phellandrene, linalool, geraniol, eugenol, eugenyl acetate, methyl eugenol, etc.

## UTILITARIAN ASPECTS OF TEJPAT SPICE

**Medicinal values and other Useful aspects of Tejpat :** The leaves of *C. tamala* are carminative, and used in nasal and chest congestion, coughs, colic, diarrhea, rheumatism, gonorrhea and in birth control. The leaf oil of *C. tamala* is reportedly a carminative, used for the treatment of colic, cough, diarrhea, gonorrhea, rheumatisms, irritations, boils, conjunctivitis, itching, sleepy-ness loss of memory, urinary problems and fatigue conditions (Baruah & Nath, 2006).

Eugenol is the active ingredient of leaf essential oil of tejpat. Eugenol has been reported as antibacterial, anti-yeast, anticonvulsant, anti-mitotic, antioxidant, cell proliferation inhibitor, hypothermic and a skeletal muscle relaxant. The leaf essential oil of *C. tamala* is reportedly possessed antifungal activities against a number of both plant and human pathogenic fungus.

Eugenol smells intensely, taste pungently, possess a strong antiseptic activity and differ effectively a number of potential plant feeders. Eugenol is the starting material for making high quality vanillin. It is used for flavouring of food stuffs, especially meat, sausages, table sauces, etc., besides being used for the formulation of various pharmaceutical products like dental creams, mouth freshner, etc. Eugenol has been reported to possess activities against honey bee.

**Smaller the Leaf size Better the quality of Tejpat spice:** It has been reported that there are inverse correlation between the leaf size and eugenol percentage/content, *i.e*. the tejpat plant possessing smaller leaves generally contained higher percentage of eugenol in its leaf oil than those possessing larger leaves. Thus, it has been justified that 'smaller the size of tejpat leaves is better the quality of its spicyness or vice-versa' **(Figure 4)** (Baruah & Nath, 2000, Baruah, 2011).

**Figure 4.** Representative Herbarium specimens of the Variants of *Cinnamomum tamala.*
A. Variant I, B. Variant II,
C. Variant III and D. Variant IV.

**Cultivation and Processing of Tejpat:** Meghalaya of Northeast India is the chief producer of tejpat spice (Anonymous, 1998). According to the data of Spices Statistics, Spices Board, Ministry of Commerce, Govt. of India, tejpat plant is grown/cultivated in more than 6010 hectares of land with production of more than 14,000 tonnes during 1995-96 (Anonymous, 1998). Besides Meghalaya where it is found abundantly both in wild and cultivated conditions up-to altitude of 1250m, is also found in Dima Hasau district of Assam up-to altitude of 1050m.

Germination, dormancy and viability of the seed of *C. tamala* Nees., the 'tejpat spice of commerce' have been studied by Baruah (2008). The fresh and matured depulped seeds with $GA_3$ (500ppm) treatment exhibits highest percentage (98.11) of germination. The seed indicate a dormancy period ranging from 7 to 42 days when are sown in nursery beds with proper shading and regular watering. With the increase of storage period, the seeds started losing viability.

In natural conditions, *C. tamala* is produce copious seeds and propagated by means of seeds. However, it has been noted that due to its aromatic pulpy pericarp as well as lack of suitable soil condition, not all the seeds fall under the tree can not germinate and ultimately lost their viability on due course.

Since, it is a crop which is grown mostly as a wild and homestead crop, no special care is needed to cultivate the crop. However, applying manure can be practiced for increasing the yield. Mulching the tree with green leaf manure can be practiced. Weeding is done 2 to 3 times, till the trees are three to five years old, but for the older plants, weeding is done only once a year.

The trees are planted at a spacing of 3m x 2m apart in regular plantations. The seedling are raised in beds and planted out permanently when the plants are 4 – 5 years old. The tree takes 6 -9 years to grow and harvesting of leaves is done when the tree is 8 – 10 years old and continues for a century. No special care is needed for cultivation. Mature leaves are collected during October – December till March, *i.e.* after and prior to monsoon as rains affect the aroma and quality (eugenol percentage) of leaves, every year from young vigorous plants and in alternate years from old and weak plants. The leaves are collected (small branches with leaves are also tide in bundles), dried in Sun and marketed. Single tree yields about 9 – 10 kg. of leaves every year (Baruah, 1998, 2011).

**Marketing of Tejpat:** Shillong of Meghalaya followed by Jatinga (Haflong) of Assam of Northeast India is the main markets of tejpat from where it is being transported to other parts of the country and abroad. Tejpat leaf is exported in large quantities from India. From India, tejpat is exported to the countries like Australia, Belgium, Canada, France, Hungary, Japan, Kenya, Korea, Kuwait, Malaysia, Mozambique, Pakistan, Singapore, South Africa, Sri Lanka, Saudi Arabia, Taiwan, USA, UK, UAE, etc (Anonymous, 1998).

## OTHER ASPECTS OF TEJPAT

**Insect pests of Tejpat, if any:** The genuine

source of tejpat spice (*C. tamala*) and 'best quality tejpat' (*C. impressinervium*) are found relatively free from pest and no insect pests have been reported in these tejpat sources. However, some gall formations are observed in both the tejpat species.

**Diseases of Tejpat and their Management:** Very few diseases have been reported on *C. tamala* plant. Rust caused by *Aecidium cinnamomi* occurs during the onset of the south-west monsoon attacking leaves and young plants (Goswami & Bhattacharjee, 1973). Roy *et al*. (1976) reported die-back disease caused by *Colletotrichum gloeosporioides* in *C. tamala* plant. Shot hole caused by *Phomopsis tezpatae* (Singh, 1978) was reported in *C. tamala*. Shot hole diseases caused by *Pestalotia cinnamoni* and *Cercospora* sp. was reported in *C. tamala* (Rahman, 1951). Leaf spot and shot hole diseases of tejpat were reported (Rahman, 1951, 1962). Leaf blight caused by *Glomerella cingulata* and thread blight caused by *Marasmius pulcherima* has also been reported in Tejpat plant. These diseases do not cause serious damage to the plant – Tajpat (Rema *et al.*, 2006).

**Related aspects and properties of Tejpat:** Joshi and Tandon (1989, 1990, 1991) reported the isolation and growth factor requirements of leaf gall induced by a mite on the genuine source of tejpat plant (*C. tamala)*. The growth regulator required by gall tissue did not differ fundamentally from those required by healthy tissue. Optimum callusing of explants occurred on a medium containing 2, 4-D (10mg/l), kinetin (0.1mg/l) and beta-mercaptoethanol (1-2 mM). Callus grew better in a medium fortified with 2, 4-D (4 mg/l) and kinetin (0.4mg/l). Gall tissue grew faster than healthy tissue. Healthy tissue failed to grow in an auxin-free medium. One year old cultures of both healthy and gall tissue grew on a medium devoid of cytokinin for a long time. The addition of caffeic acid and catechol (pyrocathechol) enhanced the growth of both normal and gall tissues, but these phenolics had no effect in the absence of auxin. Joshi and Tandon (1991) also reported that both normal and gall tissues showed indolepyruvuc acid pathway of auxin biosynthesis. A direct correlation between tryptophane and auxin contents was recorded suggesting a substrate dependent regulation of IAA. Joshi and Tandon (1989) also observed a gradient of auxin protection activity in galls (from young to the brown stage). Three auxin protectors with molecular weights of about 200, 8 and 2 Kda, respectively were isolated from gall tissue using Sephadex gel filtration. These protectors appeared to be oligomers or polymers of lower molecular weight phenolic substances.

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