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PHARMACOLOGICAL PROPERTIES OF *CINNAMOMUM TAMALA* – A REVIEW

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ABSTRACT

The present review explains therapeutic and pharmaceutical potential of *Cinnamomum tamala*, a well-known plant growing in high altitude areas of tropical and subtropical regions. All parts of plant possess many major bioactive constituents due to the presence of major chemical substances. It is useful for the treatment of various diseases or disorders such as cardiac diseases, diabetes, Anxiety, depression, ulcer, GI diseases and possess many pharmacological activities includes anti-oxidant, anti-hypercholesterolemia,anti-diarrhoeal, anti-inflammatory,anti-fungal, antibacterial etc.

KEYWORDS: *Cinnamomum tamala*, Pharmacological activity, Diseases, Uses.

INTRODUCTION

Cinnamomum tamala plant is an native of India. It is commonly known as *Tezpaat / Tezapatta* or Indian Cassia and Indian bay leaf. It belongs to *Lauraceae* family.[1] It is mainly found in moist slopes of Himalayan regions, the Khasi hills, the nilgiri hills and at thefoot of the Sikkim Himalayas.[1] Its flowers are small, yellowish and blooming in the monthof March to May. It is mainly used for flavouring food and also used in some perfumery industry for fragrance. It is widely used in pharmaceutical preparation because of its hypoglycemic, stimulant and carminative properties.[2,3] The leaves of trees used as spice having clove like taste and pepper like odour. Essential oil of *Cinnamomum* leaves has excellent inhibitory effects on bacteria. In the leaf oil of *Cinamommum. tamala*, four chemotypes namely **cinnamaldehyde, eugenol, cinnamaldehyde-linalool** and **linalool** rich type are reported in different parts of the country.[4]

This plant is frequently mentioned in various Ayurvedic literatures for its various medicinal values.[5] Leaves and bark have aromatic, astringent, stimulant and carminative qualities and used in rheumatism, colic, diarrhoea, nausea and vomiting. Ancient literature has revealed that in the 1st century A.D., dried leaves and bark of this plant were prescribed for fever, anaemia and body odour. Its seeds were crushed and mixed with honey or sugar and administered to children for dysentery or cough.

MORPHOLOGY CHARACTERISTICS OF *C. TAMALA*

PARTS[6,7,8]

All parts of plant possess a various different property which is useful for treat and cure many diseases and contains a many major bioactive compounds and various pharmacological activity and also used as a commonly in spices, flavouring agent. It is aromatic in nature and clove like taste. Some morphological properties of plant parts are discussed below.

Scientific/Botanical Classification of *C.tamala*

Kingdom-Plantae
Subkingdom-Tracheobionta (vascular plant)
Division-Magnoliophyta (flowering plant)
Class- Magnoliopsida (Dicotyledons)

Subclass-Magnoliidae (group of flowering plant)
Order -Laurales
Genus - *Cinnamomum Schaeff*
Family- Lauraceae
Species- *Cinnamomum Tamala* (Buch-Ham)
Synonyms- *Cinnamomum albiflorum Nees, Cinnamomum cassia D. Donnom. illeg*.

Various name of *C.tamala* in Different languages

Sanskrit- *Tamalpatra*
Hindi- *Tejpatta*
English- Indian Bay Leaf, Indian cassia
Marathi- *Tamalpatra*
Tamil- *Talishappattiri/ Katu-kurrnap*
Assam- *Tejpat*
Malayalam- *Tamalapatram/ Karuntoli*
Telugu- *Talisapatri*
Canada- *Patraka*
Bengali- *Tejpat*

Phytochemistry

The major constituents of the leaf essential oils of these species contain furanosesquiterpenoids as principalconstituents. (59.5%) was found to be the major compound in the leaf essential oil is β-caryophyllene (6.6%), sabinene (4.8%), germacren D(4.6%) and curcumenol (2.3%). The leaf oil was characterized by a high content of sesquiterpenoids (96.8%), dominated mainly by furanosesquiterpenoids (79.3%), curzerenone (17.6%), furanodiene (1.8%) and curzerene (1.2%). *Cinnamomumverum* contained approximately 63% cinnamaldehyde, 8% limonene, 7% eugenol, 5.5% cinnamaldehyde propylene,and 1-2% of a variety of terpenoid compounds (α -pinene, camphene) as measured by gaschromatography/mass spectrometry.[16]

Various researchers study shown that the*tejpatta* possess a various pharmacological activity such as anti-hyperlipidemic activity, anti-diabetic activity, gastro protective activity, anti-helminthic/ antiprotozoal activity, anti-inflammatory property, antiemetic activity, anti-diarrhoeal, antifungal activity, it shown potent antibacterial property against various micro-organism such as *Escherichia coli(E.Coli), Bacillus subtilis, Saccharomyces cerevisiae*, anti-oxidant property, free radical scavenging activity also exhibit CNS protective activity like, hypothermic activity.

ETHANOBOTANICAL USES

- Bark and dried leaves powder are used for reducing fever, anaemia (lack of blood), unpleasant body odour, bad mouth odour and the plant seed powder are combined with honey prescribed for children in purpose of diarrhoea, cough problem.
- The plant possess aromatic property due to the presence of its property it is useful in perfumery industry and also useful in preparation of soaps, detergents, cosmetics, toothpaste etc and also useful in food industry as a spice.
- *C.tamala* plant parts are useful for preparation of some ayurvedic formulation like *Sudarshan churna, Chandraprabhavati* etc.
- Leaves extract of plant used as a clarifier in dyeing method with *C.tamala* plant is also used as a food, fodder, medicine etc. Numerous studies showed that the plant leaves are also used for its green dyeing property.

PHARMACOLOGICAL ACTIVITIES

❖ **Antidiabetic activity:** *Cinnamon* extracts contain procyanidins which protect pancreatic β-cells, and indicate anti-diabetic activity.[10] These also increase glucose-stimulated insulin secretion in PA-treated β-cells.[10] Ethanolic extract of *Cinnamomum tamala* leaves showed hypoglycemic and antihyperglycemic activities.[11]

It also restores blood glucose level to normal and significantly increase level of total cholesterol, TG, LDL and VLDL cholesterol levels in diabetic rats.[12] and lower down chances of hyperlipidemia after regular dosage. Methanol and successive water extract of bark of *Cinnamomum tamala* was screened by using a-amylase inhibition assay for antidiabetic activity. The percentage inhibition values of bark of the *Cinnamomum tamala* were found to be 97.49% and 93.78% respectively.

❖ **Anticancer Activity**

Cinnamon tamala leaf constituents showed anticancer activity against human ovarian cancer cells. Its leaf extracts contain bornyl acetate that exhibit strong cytotoxicity to cancer cells in vitro.[13]

❖ **Anti-Arthritis and Wound Healing**

Bark of Cinnamomum i.e., *Cinnamomum zeylanicum* is one of the oldest traditional medicines for inflammatoryand painrelated disorders. Its polyphenolic fraction shows anti-inflammatory and anti-arthritis potential or anti-rheumatic agent with disease-modifying action.[14]

❖ **Antibacterial activity**

Cinnamomum tamala stem-bark extracts revealed a goodantibacterial activity.[22] Stem-bark extracts of *Cinnamomum tamala* were evaluated for *in vitro* antibacterial potential by agar well diffusion assay. The essential oil from the bark of *Cinnamomum zeylanicum* showed *in vitro* antimicrobial activity against several microorganisms.[23]

❖ **Antifungal activity**

Numerous researchers study reports that used leaves oil of this plant are possess potent anti fungal activity against many fungi such as *Aspergillus niger, A.fumigatus, Candida albicans, Rhizopus stolonifer* and *Penicillium spp*.

❖ **Antioxidant activity**

Antioxidant potential of *Cinnamomum* oil and oleoresins for mustard oil has been evaluated by different methods such as peroxide, *p*- anisidine, thiobarbituric acid and total carbonyl value method.[24]

❖ **Insecticidal Activity-**

Cinnamomum cassia Presl, plant also possesses analgesic anti-inflammatory properties. The root essential oil of *C. tamala* found toxic to mosquito larvae and fire ants. *Cinnamomum zeylanicum* showed larvicidal activity has been tested against the malaria vector *Anopheles stephensi* and filariasis vector *Culex quinquefasciatus*.

❖ **Anti-ulcer activity**

The hydro alcoholic extract of *Cinnamomum tamala* leaves was able to protect the gastric mucosa from chemical, stress, and physically induced ulcers and inhibits gastric acid secretion probably by blocking H+ K+ ATPase action and offering antioxidant protection against oxidative stress-induced gastric damage. The findings of this experimental study could lead to further isolation, and pharmacological activity of new therapeutic compounds effective against ulcer.[26]

❖ **Skin whitening property (anti tyrosinase activity)**

The plant exhibits many major bioactive constituents which possess skin whitening property. Compounds are: - cis-2-methoxycinnamic acid, cinnamaldehyde. These compounds inhibit the activity of tyrosinase enzyme.[27]

DISCUSSION

Phytochemicals are natural biologically active compounds that are known to possess physiological as well as medicinal properties. All parts of plant possess many major bioactive constituents due to the presence of major chemical substances. It is useful for the treatment of various diseases or disorders such as diabetes ,cancer **,** arthritis , Anxiety, depression, ulcer, GI diseases and possess many pharmacological activities includes anti-oxidant,anti-hypercholesterolemia,anti-diarrhoeal,anti-inflammatory,anti-fungal,antibacterial etc.

CONCLUSION

The plant *Cinnamomum tamala* is a well-known important medicinal plant. The multiple benefits of *Cinnamomum tamala* made it a true miracle of nature. Both leaves and plant bark of this plant is widely used in folk medicine .The present review reveals that the plant is used in treating various ailments. It elicits on all the aspects of the herb and draws attention to set the mind of the researchers tocarry out the work for developing its various formulations, which can ultimately be beneficial for the human beings .*Cinnamomum* species contain major group of biologically active chemicals that can be used to make highly efficacious broad spectrum pharmaceutical products.

REFERENCES

1. Khan AR, Hossain M Leaf blight of bay-leaf plants, caused by Glomerella cingulata, in Bangladesh. Bangladesh J Bot, 1985; 14: 181-182.
2. Sharma SR, Dwivedi SK and Swarup D Hypoglycaemic effect of some indigenous medicinal plants in normoglycaemic rats. Ind J Ani Sci, 1996; 66: 1017- 1020.
3. Yadav P, Dubey NK Screening of some essential oils against ringworm fungi. Ind J Pharma Sci, 1994; 56: 227-230.
4. Seth R, Mohan, M, Singh P, Haider SZ, Gupta S et al, Chemical composition and antibacterial properties of the essential oil and extract of Lantana camara Linn. from Uttarakhand (India). APJTB. S, 2012; 1407-1411.
5. *Cinnamomum tamala* (Lauraceae) by using aamylase inhibition assay for anti-diabetic activity.*Biochim Biophys Acta*, 1998; 1388: 10-20.
6. Prabuseenivasan S, Jayakumar M, Ignacimuthu S. *In vitro* antibacterial activity of some plant essentialoils. *BMC Complementary and Alternative Medicine*, 2006; 6: 39.
7. Soni N and Prakash S. Green nanoparticles for mosquito control. ScientificWorldJournal, 2014; 2014: 496362.
8. Upadhyay K Ravi, Therapeutic and Pharmaceutical Potential of *CinnamomumTamala*, Research Reviews in Pharmacy and Pharmaceutical Sciences, 2017; 6(3): 18-26.
9. Majumder Pulak *et al*, An ethano-phytochemical and pharmacological review onnovel indian medicinal plants used in herbal formulations, International Journalof Pharmacy and Pharmaceutical Sciences, 2013; 5(4): 74-83.
10. Rao V Pasupuleti *et al*, Cinnamon: A Multifaceted Medicinal Plant, Hindawi Publishing Corporation, 2014. DOI- http://dx.doi.org/10.1155/2014/642942.
11. Majumder Pulak *et al*, An ethano-phytochemical and pharmacological review on novel indian medicinal plants used in herbal formulations, International Journal of Pharmacy and Pharmaceutical Sciences, 2013; 5(4): 74-83.
12. Simic A, Sokovic MD, Ristic M, et al. The chemical composition of some Lauraceae essential oils and their antifungal activities. *Phytother Res.*, 2004; 18: 713-770
13. Sun P, et al. Trimer procyanidin oligomers contribute to the protective effects of cinnamon extracts on pancreatic β-cells in vitro. Acta Pharmacol Sin, 2016; 37(8): 1083-1090.
14. Chakrobarty U and Das H. Antidiabetic and antioxidant activities of Cinnamomum tamala leaf extract in Stz-treated diabetic rat. Glob J Biotech Biochem, 2010; 5: 12-18.
15. Bajaj S, Srinivasan BP. Investigations into the anti-diabetic activity of Azadirachta indica. Scoparia dulcis. Indian J Pharmacol, 1998; 31: 138-141.
16. Lin CY, et al. Cinnamomum cassia extracts reverses TGF-β1-induced epithelial-mesenchymal transition

in humanlung adenocarcinoma cells and suppresses tumor growth in vivo. Environ Toxicol, 2017; 4.
17. Rathi B, et al. Ameliorative effects of a polyphenolic fraction of Cinnamomum zeylanicum L. Bark in animal models of inflammation and arthritis. Sci Pharm, 2013; 81(2): 567-589.
18. Pandey AK, et al. Antifungal and antioxidative potential of oil and extracts derived from leaves of Indian spice plantCinnamomum tamala. Cell Mol Biol (Noisy-le-grand), 2012; 58(1): 142-147.
19. Chang CT, et al. Chemical composition and tyrosinase inhibitory activity of Cinnamomum cassia essential oil. BotStud, 2013; 54(1): 10.
20. Zaidi SF, et al. Anti-inflammatory and cytoprotective effects of selected Pakistani medicinal plants in Helicobacter pylori-infected gastric epithelial cells. J Ethnopharmacol, 2012; 141(1): 403-410.
21. Azab SS, et al. Anti-inflammatory and gastroprotective potential of leaf essential oil of Cinnamomum glanduliferum in ethanol-induced rat experimental gastritis. Pharm Biol., 2017; 55(1): 1654-1661.
22. Shin WY, et al. Protective effects of Cinnamomum cassia (Lamaceae) against gout and septic responses via attenuation of inflammasome activation in experimental models. J Ethnopharmacol, 2017; S0378-8741(16): 32278-322784.
23. Mollenbeck S, Konig T, Schreier P, et al. Chemical composition and analysis of enantiomers of essential oils from Madagascar. *Flavour Fragrance J.,* 1997; 12: 63-9.
24. Roux GF, Perrier J, Forest E, Mouren GM, Puigserver A, and Santimone M. Screening of bark of *Cinnamomum tamala* (Lauraceae) by using aamylase inhibition assay for anti-diabetic activity. *Biochim Biophys Acta*, 1998; 1388: 10-20.
25. Palmer AS, Stewart J, Fyfe L. Antimicrobial properties of plant essential oils and essences against five important food-borne pathogens. *Letters in Applied Microbiology*, 1998; 26: 118-122.
26. Prabuseenivasan S, Jayakumar M, Ignacimuthu S. *In vitro* antibacterial activity of some plant essentialoils. *BMC Complementary and Alternative Medicine*, 2006; 6: 39.
27. Osawa T and Namaki M. A novel type antioxidant isolated from leaf wax of Eucalyptus leaves. *Agric Biol Chem*, 1983; 45: 735-739.
28. Miller NJ and Rice- Evans CA. Factors affecting the antioxidant activity determined by ABTS+ radical cation assay. *Free Radic Res*, 1997; 26: 195-199.
29. Lima ZP, Severi JA, Pellizzon CH, Brito AR, Solis PN.Gastroprotective activity of Cinnamomum tamala leaves on experimental gastric ulcers in rats.*Journal of Ethnopharmacology*, 2010; 128: 537-540.
30. Vardar Unlu G, Candan, Sokmen A, Domez Eand Tepe B. Antimicrobial activity of essential oil from *C.tamala* (Lauraceae). *J Agric Food Chem,* 2003; 51.