Cinnamomum tamala (Tejpatta): A powerful natural herbs

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ABSTRACT: *Cinnamomum tamala* (Buch.-Ham.) is a versatile and valuable perennial species commonly referred to as Tezpat/ Tezapatta. Commercially prepared herbal medications derive from its easy accessibility, therapeutic qualities, and minimal adverse effects. The leaves of the plant serve as a spice and flavor enhancer. It is effective in addressing various ailments and conditions such as colon cancer, diabetes, heart diseases, CNS disorders, and bleeding issues. Additionally, it aids in appetite concerns, oral issues like dryness and bad breath, and rheumatism. Plant leaf oil contains significant bioactive components including Furanogermenone, β-caryophyllene, germacerene d, curcumenol, curzerenone, furanodiene, furanodienone, and has a high concentration of sesqui- terpenoid compounds, among others. *C. tamala* is an abundant source of polyphenols and flavonoids, which act as organic antioxidants. *C. tamala* demonstrates anticancer properties by inducing cell death and preventing tumor expansion. The plant's elements further disrupt pathways that promote cancer, such as blocking angiogenesis and metastasis. *C. tamala* demonstrates hepatoprotective effects by lowering oxidative stress and inflammation, which are crucial contributors to liver injury. It also exhibits strong anti-inflammatory characteristics by blocking the secretion of pro-inflammatory cytokines such as TNF α, IL-6, and NF-κB.

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Introduction

Natural aromatic herbs have been highly regarded as a source of medicine throughout human history and indicating an increasing part of modern high-tech medicine (Kumar *et al.,* 2021). Kaundal and Kumar, (2025) updated that medicinal or aromatic plants can have an important impact on increasing employment among rural populations, as herbal plants have historically contributed significantly to the health of the community. Dubale *et al*., (2025) mentioned in his article that a according to the World Health Organization (WHO) report, 80% of the population in India relies on traditional medicine for their primary healthcare needs. The herbal drugs are formulated commercially because of its easy availability, medicinal properties and its reduced side effects. *Cinnamomum tamala* is a multipurpose valued, perennial vegetation. It is widely referred to as Tezpat/ Tezapatta or Indian Cassia and Indian bay leaf belongs to Lauraceae Family (Tiwari and Talreja, 2020). Saroj *et al.,* (2022) reported that tejpatta is primarily located on damp inclines of the Himalayan areas at elevations up to900m to 2500m. Areas such as Utrakhand, Manipur, Nainital, Himachal Pradesh, Assam, Arunachal Pradesh, along with certain hilly regions such as mikir hill, garo hill, khasi hill, nilgiri hill, jaintia hill, and also observed in several areas of India, Nepal, Bhutan, China (Saroj *et al.,* (2022). Leaves are thickened, pointed/acuminate ovate and 12-20 cm in length, 5-8 cm in breadth (Kashyap *et al*., 2024. He also updated that young leaves are a reddish-pink hue, and over time, their color transitions to a deep green that imparts a shiny look. (Kashyap *et al*., 2024). The ripe fruit of *C. tamala* is a deep violet, and oval-shaped drupe. The plant features a drupe that can reach a length of up to 13 mm. Tejpatta is used to impart a distinctive taste in multiple recipes (Thakur *et al*., 2021). They also reported that Spices are extensively used in the meat, sauce, canning, frozen food sectors, and food production industries. and also in cosmetic and perfumery industries (Thakur *et al*., 2021). The essential oils derived from the spices are likewise utilized in numerous Ayurveda and allopathic formulations (Jain *et al*., 2025). Bachheti *et al*., (2022) reported that Tejpatta This plant is beneficial for addressing various illnesses and conditions including colon cancer, diabetes, heart diseases, CNS disorders, and bleeding disorders. and it is likewise helpful for issues related to appetite, oral concerns such as dryness, bad or unpleasant breath, and rheumatism. Kumar *et al.,* (2016) described in their article that traditional ayurvedic herbal remedies made from

tejpatta plants are linked to numerous healing qualities that address various health issues without inflicting significant harm on the human body. The present updated review focused on the phytochemical analysis of tejpatta leaf together with its potent therapeutic activity.

Figure- Dry leaf of tejpatta

Figure- Bark of tejpatta

Figure- Tree of tejpatta

Phytochemistry

Pathak and Sharma, (2021) reported that *Cinnamom* is made up of several resinous substances, such as cinnamaldehyde, cinnamate, cinnamic acid, and many essential oils. Angane *et al.,* (2022) reported that EOs encompass a wide range of volatile organic substances found in nature, such as *trans*-cinnamaldehyde, eugenol, cinnamyl acetate, L-borneol, *ß*-caryophyllene, caryophyllene oxide, L-bornyl acetate, *a*-thujene, *a*-terpineol, *a*-cubebene, terpinolene and E-nerolidol. Narayanankutty *et al*., (2021) identified as the primary substance in the leaf oil of *Cinnamomum.* Cinnamaldehyde and its derivatives, butanolides, diterpenoids, lignans, and various other compounds are found in this genus. Damasceno *et al*., (2025) updated the genus *Cinnamomum*, sum of 127 chemical substances has been recognized. Phenylpropanoids and also contains a minor amount of α - humulene, α–muurolene (Schepetkin *et al*., 2021).

Antioxidant activity

Oxidative stress plays a crucial role in the onset of various illnesses, such as cancer, neurodegenerative diseases, and cardiovascular conditions. (Pizzino *et al*., 2017). Vaishnav *et al*., (2025) mentioned in his paper that *C. tamala* is an abundant source of polyphenols and flavonoids, which play as natural antioxidants. Gulsin, (2025) updated that these compounds exert their protective effects by neutralizing detrimental free radicals, boosting the function of natural antioxidant enzymes including superoxide dismutase, catalase, and glutathione peroxidase, and ultimately diminishing oxidative harm to essential biomolecules such as lipids, proteins, and DNA. Gaurav *et al*., (2021) evaluated the antimicrobial effectiveness of two *Cinnamon* leaves oils and extracts (T-2 and T-19) via disc diffusion assay and the lowest inhibitory concentration using two-fold serial dilution technique against food born pathogenic microorganisms *i.e. E.coli* (MTCC 723), *B. Cereus* (MTCC 430), *S. aureus* (MTCC 3381), *S. typhi* (MTCC 734) and *C. perfringens* (MTCC 1349). They discovered that essential oils and extracts demonstrated the largest area of inhibition (AOI) against *S. aureus* and *E.coli.* They concluded that Minimum inhibitory concentration (MIC) for both oils and extracts varied from 0.156 mg/ml to 5 mg/ml, along with the antioxidant characteristics of oils and extracts derived from cinnamaldehyde type. *Cinnamon* exhibited greater antioxidant activity compared to the linalool type. Consequently, the findings indicate that the essential oil of cinnamaldehyde type Cinnamon may serve as a promising abundant source of natural antioxidants and is also more proficient against foodborne pathogens than the linalool type, potentially functioning as natural antibacterial agents in food preservation (Gaurav *et al*., 2021). Bhatia *et al*., (2024) examined the phytochemical composition of the leaf both qualitatively and quantitatively. Following the phytochemical analysis of the leaf, the capacity for antioxidant activity against free radicals (ABTS and DPPH) was assessed. They concluded that the presence of various alkaloids, steroids, and flavones was disclosed through qualitative evaluation. *Cinnamon* oil displayed the greatest antioxidant activity with an IC50 value of 40.85 ± 4.96 and 18.57 ± 0.10 µg/min DPPH and ABTS assay (Bhatia *et al.,* 2024). Chaudhary *et al*., (2024) investigates the chemo diversity, *in vitro* antioxidant, α-amylase and α-glucosidase inhibition capabilities of *Cinnamomum tamala* leaf essential oil gathered from various areas of East Khasi Hills District in Meghalaya, India. They discovered that it exhibited the highest antioxidant activity (IC_{50}=11.23 ± 0.27 µg/mL for 2,2-diphenyl-1-picrylhydrazyl (DPPH) and IC_{50}=21.54 ± 0.37 µg/mL for 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid (ABTS) across all EOs assessed. Pandey *et al.,* (2019) reported that free radicals play a crucial role in influencing human health by leading to various illnesses such as cancer, hypertension, heart attacks, diabetes, etc. The foliage of two species of *Cinnamomum* namely *C. glanduliferum* and *C. tamala*, which are in great demand in the spice sector were selected to assess their antioxidant properties in aqueous and methanolic extracts. The antioxidant components, namely flavonoids, total phenolic content, and tannins were also examined in these plants. *C. tamala* demonstrated increased antioxidant activity through DPPH and ABTS techniques. The antioxidant components, namely total phenol, flavonoids, and tannins, were also present in greater amounts in *C. tamala*. They suggested that these *Cinnamomum* species can additionally serve as a source of natural antioxidants in the food and pharmaceutical sectors (Pandey *et al*., (2019).

Antidiabetic activity

Palanisamy *et al.,* (2011) reported the anti-diabetic activity of *C. tamala* with particular emphasis on its healing and safeguarding function in the streptozotocin-induced diabetic animal model. The noted that the effectiveness of a 50% ethanolic extract derived from the leaves of *Cinnamomum tamala* exhibited a notable reduction in blood glucose levels and an enhancement in antioxidant activity in diabetes induced by streptozotocin. Huang and Chen, (2023) also observed that the oral delivery of the 50% ethanolic extract derived from the leaves of *Cinnamomum tamala* extracted for rats with diabetes induced by streptozotocin and concluded that it exhibited notable favorable alterations in the

biochemical and physiological metrics associated with carbohydrate, protein, and lipid metabolism in streptozotocin-induced diabetic rats. Cordero *et al*., (2014) noted the blood sugar-lowering effects of the leaf of *C. tamala* was utilized to examine its impact on diabetes through a rat model. He tested different doses of the ethanol extract of *C. tamala* administered to alloxan-induced diabetic rats for 15 days, and the impact of the treatment on blood glucose levels, glycosylated hemoglobin, and peroxidation products like thiobarbituric acid reactive substances and serum lipids was observed. The reported that oral administration of the ethanol extract of *C. tamala* resulted in a notable reduction in blood sugar levels, glycosylated hemoglobin, thiobarbituric acid reactive substances, and serum lipids in diabetic rats (Cordero *et al*., 2014). Wang *et al*., (2025) reported that *Cinnamon*, being rich in polyphenols and flavonoids, demonstrates considerable antioxidant properties. He additionally determined that *Cinnamon* contributes the regulation of glucose and lipid metabolism. Gogoi *et al*., (2014) investigated *in vivo* analyses revealed that cinnamon may successfully reduce hyperglycemia, insulin resistance, and disruptions in lipid metabolism through enhanced relative abundance of *Akkermansia* and *Ligilactobacillus* at the genus level and a reduced Firmicutes/ Bacteroidetes ratio at the phylum level. Beji *et al*., (2023) investigates the effect of *Cinnamon* powder supplementation on glucose levels, lipid profiles, and oxidative stress indicators in alloxan-induced diabetic rats. Diabetes was triggered in adult male Wisterrats through one subcutaneous alloxan injection (15 mg/kg).They noted that anti-oxidative enzymes such as glutathione peroxidase, catalase and superoxide dismutase were sought in the serum and pancreas. Alloxan led to an elevation in the fasting blood sugar level. The delivery of cinnamon blocked the increase of blood glucose and results indicated that cinnamon exhibits an anti-hyperglycemic action, enhances lipid profiles, and safeguards against damage caused by oxidative stress in a diabetic condition (Beji *et al*., 2023).

Anticancer Activity

C. tamala displays anticancer properties by inducing cell death (apoptosis) and preventing tumor expansion (Mohanty *et al*., 2024). Yuan *et al*., (2022) reported that extracts and essential oils derived from the plant encompass bioactive substances such as bornyl acetate, cinnamaldehyde, and flavonoids, which have demonstrated effectiveness in diminishing tumor size, extending lifespan in cancer-afflicted animals, and inhibiting the growth of cancer cells. Caserta *et al*., (2023) updated that the plant's substances also disrupt cancer-inducing pathways, including the inhibition of angiogenesis and metastasis. Agena *et al*., (2023) also mentioned in his article that the bioactive substances found in bay leaves demonstrate cytotoxic effects on cancer cells by way of various essential mechanisms. The also highlighted that These encompass the initiation of apoptosis, which occurs through the upregulation of pro-apoptotic proteins like Bax, caspase-3, and caspase-9. (Agena *et al*., (2023). Zhang *et al*., (2017) also reported that these substances can hinder the growth of cancer cells by inducing cell cycle arrest and it also illustrates the capacity to hinder angiogenesis and metastasis by blocking VEGF (Vascular Endothelial Growth Factor) and MMPs (Matrix Metalloproteinases). Mohanty *et al*., (2024) reported that *C. tamala* leaf, is a highly recognized classical ayurvedic remedy employed to address multiple health issues. The molecular mechanism of action of *Cinnamomum tamala* essential oil (CTEO) in the fight against non-small cell lung cancer (NSCLC) continues to be difficult to establish (Mohanty *et al*., 2024). Tan *et al*., (2024) updated that enrichment analysis in leaf disclosed that the subjects were primarily engaged in apoptosis,TNF, IL17, pathways in cancer and MAPK signaling pathways and mRNA expression, disease phase, survival assessment, immune cell infiltration relationship andgenetic alteration examination of the central hub genes. Park *et al*., (2020) suggested that cinnamaldehyde iis the most reactive and the least stable substance. Shahwara *et al*., (2025) investigated anticancer activity of *Cinnamon tamala* leaf components against human ovarian cancer cells. They observed that *Cinnamon tamala* leaf extracts produced bornyl acetate, caryophyllene oxide, p-coumaric acid and vanillic acid using A-2780 human ovarian cancer cell lines and reported that compound 1 showed the greatest cytotoxic effect with 90.16 ±1.06% inhibition (IC50=5.30 x 10-4 mg/ml), succeeded by compound 2 (84.40 ±1.53% inhibition; IC50=8.94 x 10-3 mg/ml), whereas compounds 3 and 4 displayed no activity in the bioassay (Shahwara *et al.,* (2025). Bhatia *et al*. 2024) also examined the cancer-fighting properties of *Cinnamomum tamala* leaf extract against *Ehrlich ascites* carcinoma in Swiss albino mice and concluded that the ethanolic and acetone extract of *Cinnamomum tamala* leaves were determined to be important for the anticancer effectively in the mice. Giri *et al*., (2022) reported that the Tejpata leaves extract comprises several significant bioactive compounds like bornyl acetate, which is beneficial in combating ovarian cancer. Latter study revealed that these significant bioactive components have a cytotoxic impact on cancer cells and reduce prostate growth while also inhibiting or diminishing the number of abnormalities and also have anti-inflammatory properties (Giri *et al*., 2022).

Hepatoprotective Activity

C. tamala shows hepatoprotective effects by minimizing oxidative stress and inflammation, both of which are critical contributors to liver injury (Ramasamy and Gupta, 2025). Meng e*t al*., (2020) updated that leaf extracts can safeguard the liver from paracetamol- and carbon tetrachloride-induced liver damage in animal models by enhancing antioxidant enzymes such as superoxide dismutase and catalase while maintaining the liver's cellular integrity. Paul *et al*., (2025) assessed its shielding effects against paracetamol-induced liver toxicity in mice. He tested ethanolic leaf extract of *C. tamala* at various dosages was given through oral gavage alongside or in the absence of the standard liver-protective medication silymarin, and liver biochemical and histopathological assessments were performed. Findings indicate that leaf considerably improves antioxidant potential with reduced animal N-acetyl-p-benzoquinone imine byproducts (Paul *et al*., (2025). Eidi *et al*., (2012) assessed the safeguarding influence of cinnamon bark extract against carbon tetrachloride (CCl4)-triggered liver injury in male Wistar rats and noted that Administration of cinnamon extracts (0.01, 0.05, and 0.1 g/kg) over a period of 28 days notably diminished the effects of CCl4 toxicity on the serum indicators of liver injury, including aspartate aminotransferase, alanine aminotransferase, and alkaline phosphatase. The also confirmed that Moreover, administering cinnamon extract significantly elevated the levels of superoxide dismutase and catalase enzymes in rats. Histopathological examinations of the liver in rats further confirmed that cinnamon extract considerably diminished the toxicity of CCl4 and maintained the histo architecture of the liver tissue close to normal (Eidi *et al*. 2012). Thakur *et al*., (2021) reported in his review that hepatoprotective effect of methanolic extract of *C. tamala* leaves against paracetamol-triggered toxicity in Swiss albino mice. Liver damage led to an increase of cellular enzymes in plasma. They treated with *C. tamala* extract at dosages of 100 and 200 mg/kg for eight days and noted that Greater hepatoprotective activity was noted when the model was treated with 200mg/kg of dose (Thakur *et al*., 2021).

Antidiarrheal Activity

C. tamala exhibits antidiarrheal effects by decreasing the accumulation of fecal material and intestinal fluids & in research models, like the castor oil-triggered diarrhea model in rats (Kumar, 2008). Rao *et al*., (2008) examined the antidiarrheal capability of 50% ethanolic extract of *Cinnamomum tamala* on induced castor oil diarrhea, gastric clearance of phenol red meal, gastrointestinal movement of charcoal meal and *in vitro* mast cell degranulation function. They concluded that *C. tamala* extract (25, 50 and 100 mg/kg, orally) resulted in a dose-dependent decrease in the overall quantity of fecal matter in castor oil-induced diarrhea. The average distance covered by charcoal meal at doses of 50 and 100 mg/kg of extract demonstrated a notable decrease in the secretion of gastrointestinal fluid accumulation by 32.5–65.0%. The Na+ and K+ levels in castor oil induced fluid accumulation demonstrated a stronger inhibitory impact on Na+ levels compared to K+ concentrations (Rao *et al*., 2008) . Pravin *et al*., (2013) reported in his review that *C. tamala* notably decreased the lipid peroxidation and enhanced the catalase activity when compared to the groups induced by castor oil. Chaudhary *et al*., (2024) reported that *C. tamala* leaf extract did not demonstrate any considerable effect at an increased dosage (15 mg/ml) on mast cell degranulation and the extract at doses of 5 and 10 mg/ml provided considerable protective effects on mast cells. Eswaran *et al*., (2010) examined the protective effects on the gastrointestinal tract of *Cinnamomum tamala* leaves (CTE) extract (50, 100, and 200 mg/kg of body weight) administered orally, two times a day in rat for 5 days to prevent ulcers caused by ethanol (EtOH), cold-restraint stress (CRS), and pylorus ligation (PL). A notable reduction in the lesion index was seen in ulcer-affected animals treated with CTE at varying doses in comparison to the ulcerated rats across all models. A significant decline was noted in the level of H^+K^+ATPase, the quantity of gastric fluid, and acid secretion. At the same time, the concentration of gastric wall mucus and pH rose markedly. These indicated dose-related effect of CTE (Eswaran *et al.*, 2010).

Antimicrobial Activity

Banu *et al*., (2017) studied on *Cinnamomum tamala and* shows that both its essential oils and acetone extracts demonstrate fluctuating antibacterial effectiveness against *E. coli, Salmonella typhi, Pseudomonas aeruginosa, Bacillus cereus, Bacillus subtilis* and *Staphylococcus aureus*. Neagu *et al*. (2023) reported that the essential oils typically demonstrate considerable effectiveness, especially against Gram-positive bacteria such as *S. aureus* and *B. cereus* and Gram-negative microorganisms such as *E. coli*, the efficacy of the acetone extract can differ, with some research indicating that it may be less potent or even ineffective against specific pathogens. Sirohi *et al.*, (2016) reported that the essential oils of *C. tamala* have been discovered to suppress the development of two ringworm fungi, *Trichophyton mentagrophytes and Microsporum audounil*. The minimum 500 ppm of concentration of essential oil of *C. tamala* suppressed fungal development in contaminated food technique. In this approach, the trial dose was mixed in the culture medium and the essential oil demonstrated greater efficacy in

comparison to certain artificial antifungal substances (Sirohi *et al.*, 2016). Liu *et al*., (2017) reported alcoholic extract of *C. tamala* foliage in opposition to Trichophyton rubrum, *Microsporum gypseum and Epidermophyton floccosum*. An inhibition zone was also observed against *Candida albicans* with alcoholic extract. Pandey *et al*. (2012) indicated that the antifungal effectiveness of volatile oil and oleoresins extracted from *Cinnamomum tamala* leaves against certain fungi such as *Aspergillus niger, A. flavus, A. solani*, etc. Oleoresins displayed lower inhibitory properties in comparison to volatile oil. Gupta *et al*., 2023) evaluated the antimicrobial properties of 35 Indian spices, discovering that fifteen of them exhibited antimicrobial activity. The extract from the leaves of *C. tamala* has been discovered to suppress the development of *Saccharomyces cervisiae*. Bharadwaj *et al*., (2022) investigated antibacterial effects of essential oils and acetone extract of *C. tamala* leaves against *E. coli, Salmonella typhi, Pseudomonas aeruginosa, Bacillus cereus, Bacillus subtilis, and Staphylococcus aureus*.

Anti-inflammatory Activity

Sharifi *et al*., (2021) updated that chronic inflammation is linked to several diseases, including arthritis, heart diseases, and cancer. *Cinnamomum tamala* exhibit strong anti-inflammatory effects by obstructing the release of pro-inflammatory cytokines like TNF α, IL-6, and NF-κB. Research suggests that bay leaf extracts can diminish. The inflammatory indicators and inhibit inflammatory pathways, presenting it as a possible treatment option for inflammatory conditions (Sharifi *et al*., 2021). Prajapati *et al*., (2019) experimented that the administration of cinnamon dosage (100mg/kg, 200mg/kg, and 400mg/kg) in rats and the induction of paw edema in rats via carrageenan and acetic acid is utilized in rats for vascular permeability. They noted that the water extract suppress or diminish the swelling in rats caused by carrageenan and also lessen/inhibit the vascular permeability triggered by acetic acid; furthermore, the research also uncovered that the *In vitro* management of plant extract have membrane stabilizing process in density dose dependent manner (Prajapati *et al*., 2019).

Antihyperlipidemic Activity

Fateh *et al*., (2024) investigated that *cinnamon* has lipid-lowering, or antihyper-lipidemic, effects, especially in animal research and certain human studies, by decreasing total cholesterol, triglycerides, and LDL cholesterol, while elevating favorable HDL cholesterol. Brites *et al*., (2017) also reported that tits impact is associated with its antioxidant properties, which aid in lowering oxidative stress, and its capacity to prevent LDL oxidation, diminish pro-inflammatory indicators, and possibly influence lipid metabolism via enzymatic routes. Handayani *et al*., (2023) stated that the water and ethanol extract from the leaves of this plant demonstrates a cholesterol-lowering effect. He tested the ethanol and aqueous leaf extracts of the plant are given orally to rats (dose 400 mg/kg per day) for 10 days and concluded that consistent administration of leaf extract dosage has been shown to prevent or diminish the elevated levels of serum total cholesterol and LDL., harmful cholesterol, Very Low Density Lipoprotein, and elevate/enhance the amount of Good cholesterol/HDL (high density lipoprotein) (Handayani *et al*., 2023).

Neuroprotective Effects

Neurodegenerative conditions, such as Alzheimer's and Parkinson's diseases, are frequently associated with oxidative stress and inflammation in the nervous system.*Cinnamomum tamala*could provide neuroprotective advantages via multiple pathways (Teleanu *et al*., 2022). Azargoonjahromi, (2024) reported that These encompass the ability to boost cognitive abilities by decreasing the buildup of beta amyloid plaques, shielding neurons from harmful oxidative stress, and adjusting neurotransmitter levels, which can ultimately lead to better brain performance.

Cardioprotective Effects

Tiwari and Talreja, (2020) reported that extracts derived from *C. tamala* have demonstrated encouraging heart-protective benefits. They also updated that These advantageous characteristics involve the capacity to decrease blood cholesterol and triglyceride levels, alleviate hypertension potentially by influencing nitric oxide, and avert atherosclerosis by lessening lipid peroxidation in the cardiovascular system (Tiwari and Talreja, 2020).

Molluscicidal Activity

Singh *et al*., (2012) described in his book that molluscicidal properties of *C. tamala* are linked to its numerous bioactive substances, which may exert a harmful impact on snails. Srivastava *et al*., (2014) reported that plant derived molluscicides can demonstrate considerable toxicity, rendering it a possible method for disrupting the life cycle of parasites that depend on snails as hosts. *C. tamala* extracts can be employed to manage snail numbers, which aids in decreasing the occurrence of parasitic illnesses spread by snails, such as fasciolosis (Singh *et al*., 2012). Srivastava *et al*., (2010) reported that plant *C. tamala* is powerful molluscicides. They explained in their review article that eugenol and terpenoids are the key molluscicidal elements present in the leaves of *C. tamala and the* toxicity of leaf powder of *C. tamala* against *Lymnaea acuminata* and *Endoplanobis exustus* (24hLC_{50}- 1287.83 mg/l and 24hLC_{50}-1371.53 mg/l) exhibited dependence on both time and dosage. The ethanolic extract of the leaf powder demonstrated

greater toxicity towards *L. acuminata and E. exustus* (24.44 mg/l and 34.02 mg/l) compared to the solvent extract (Srivastava *et al*., 2010).

Conclusion

Herbal aromatic plants have played an important role in supporting the well-being of the community throughout history. *C. tamala* is among the most frequently utilized spices in Indian cuisine. The various advantages of *C. tamala* transformed it into a remarkable natural phenomenon. Every component of the plant contains numerous significant bioactive chemical elements such as Cinnamaldehyde, trans-cinnamaldehyde, 3,4,5,7-tetrahydroxyflavone, 3,3,4,5,6-pentahydroflavone (non-glycoside compounds), kaempferol, eugenol, and others. These phytochemicals are beneficial in treating a variety of ailments or conditions including cancer, diabetes, ulcers, and gastrointestinal infections, and demonstrate pharmacological effects such as anti-diabetic, multiple anti-inflammatory, and anti-microbial properties.-diarrheal, anti-fungal, and liver-protective effects. It highlights all the facets of the plant and directs researchers' focus to undertake efforts aimed at creating its diverse formulations, which could ultimately be advantageous for both humans and animals.

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