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Abdullah AzmiRegional Research Institute of
Unani Medicine, Ghungoor,
Silcher, Assam, India**Shakeeb Ahmad Khan**Technical Officer (Unani),
Regional Research Institute of
Unani Medicine, Silcher, Assam,
India**Uzma Siddiqui**SRF (Unani), Regional Research
Institute of Unani Medicine,
Silcher, Assam, India**Mohammad Sami**PG Scholar, Department of
Ilmul Advia, NRIUMSD,
Hydrabad, Telangana, India

Medicinal properties of Darchini (*Cinnamomum zeylanicum*): A review

Abdullah Azmi, Shakeeb Ahmad Khan, Uzma Siddiqui and Mohammad Sami

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Abstract

The history of herbal medicines is as old as human civilization. Darchini is one of the important medicines used in spices since ancient times, commonly known as Cinnamon. Unani physicians like Dioscorides, Galen, and Ibn sina have also described its medicinal properties. It consists of the dried inner bark of the shoots of *Cinnamomum zeylanicum*, belonging to the Lauraceae family. It is an evergreen tree, native to Sri Lanka and the Malabar coast of India. It has demulcent, anti-inflammatory, antiseptic, deobstruent, liver tonic, stomachic, and carminative actions. The therapeutic usage is mainly in hepatic and gastric complaints, and it is an excellent appetizer. Cinnamon bark contains about 0.5-1.0% of volatile oil. The essential oil extracted from the bark of cinnamon contains various compounds, including cinnamaldehyde, which contributes to its distinct flavour and aroma. Additionally, benzaldehyde and terpenes are also present in smaller amounts, the oil have antioxidant and hepatoprotective and antimicrobial activity.

Keywords: Unani Medicine, Darchini, Liver tonic

1. Introduction

In the Unani system of medicine, various spices are utilized as remedies for different ailments. Darchini, commonly known as Cinnamon, has a rich history in traditional Indian and Chinese medicine, and it has also been used as a food additive in Asia. The history of spices is intertwined with the history of humankind itself, with empires rising and falling based on the trade of exotic spices from distant lands. The captivating allure of these spices has played a significant role in shaping the very foundations of our society ^[1].

The history of herbal medicines is as old as human civilization ^[2]. Darchini is one of important medicine, used in spices since ancient time. *Dioscordiese*, *Galen*, and *Ibn Sina*, have also described its medicinal properties ^[3-4]. Cinnamon, derived from the dried inner bark of the *Cinnamomum* tree, is native to regions such as Sri Lanka (formerly Ceylon), the Malabar Coast of India, and Myanmar (Burma). It is also cultivated in South America and the West Indies. The spice has a distinctive brown color, a precisely fragrant aroma, and a warm sweet flavour ^[3, 5]. Cinnamon has a rich history dating back to ancient times. It was introduced to Egypt as early as 2000 BC. In Ancient Egypt, cinnamon was valued not only for its culinary uses but also for its preservative properties. Remarkably, it was used in the preservation of mummies ^[3-5]. There are over 250 plant species in the cinnamon genus. But only 4 types or varieties of Cinnamon are used for commercial purposes. Such as, Ceylon cinnamon (*Cinnamomum zeylanicum*), Cassia cinnamon (*Cinnamomum aromaticum*), Korintje cinnamon (*Cinnamomum burmanni*) and Saigon cinnamon (*Cinnamomum loureiroi*). Ceylon cinnamon (*Cinnamomum zeylanicum* Blume), a variety native to Sri Lanka, sometimes referred to "true" cinnamon" globally, is one of the oldest and most important spice crops used for culinary purposes in Sri Lanka for centuries ^[4, 6, 7]. It has been used in Indian system of medicine and flavouring for foods. In addition to its spice uses. Darchini has been used in traditional herbal medicine to treat a variety of health conditions ^[4, 7]. It is divided into different type on the basis of colour, odour, taste. The finest variety of Cinnamon is characterized by its strong odour, aromatic profile, and sweet taste. It typically exhibits a reddish colour and is found in the form of compound quills. These quills, or Cinnamon sticks, are known for their quality and can reach a length of about 1 meter ^[6, 8]. Cinnamon is indeed known for its characteristic odour and is commonly used in condiments, candies, and also preparation of perfumes. The essential oil extracted from the bark of cinnamon contains various compounds, including cinnamaldehyde, which contributes to its distinct flavor and aroma.

Corresponding Author:**Abdullah Azmi**Regional Research Institute of
Unani Medicine, Ghungoor,
Silcher, Assam, India

Additionally, benzaldehyde and terpenes are also present in smaller amounts, the oil have antioxidant and hepatoprotective [2, 9-10]. Darchini is highly *Mulattif* (Demulcent), *Mohallil* (Anti-inflammatory), *Dafa-e-ufonat* (Antiseptic) *Mufatteh* (Deobstruent), a little *Qabiz* (astringent), *Kasir riyah* (Carminative) [8, 11-13]. It is especially used in hepatic and gastro complaints. Its properties make it an excellent appetizer due to its distinct properties, including a pleasant *Khushboo* (scent), soothing *Latafat* (Demulcent) qualities and *Qabiz* properties (Astringent), make it a suitable liver tonic due to their distinct effects. There are many scientific studies carried out for different action like hepatoprotective, anti-oxidant [9, 10], anti-inflammatory [14] etc. Unani physician intended it into different dosage form of cinnamon like *Roghan* (oil), *Tila* (Liniments) etc. Along with the single uses there are many compound preparations described with their wide therapeutic effects. Cinnamon exhibits diverse biological functions including anti-inflammatory, anti-microbial and anti-diabetic functions [15]. Cinnamon is rich in essential oils and tannins which inhibit microbial growth. The most important chemical constituents of Cinnamon are volatile oil, mucilage, diterpenes and proanthocyanidins [15-16].

2. Mahiyat (Unani description)

It is bark of a long tree, reddish in colour. The barks are thin, overlaps on each other and present in the form of compound quill. It has strong odour, aromatic, sweet and astringent sensation on tongue [4, 8, 13, 17]. Unani physicians have classified various varieties of Darchini based on the color of its bark, texture, and odour, recognizing the significance of these distinctive characteristics in determining its medicinal properties. One type of Darchini has an odor resembling that of *Saleekha* (*Cinnamomum cassia*) and the colour of the outer bark look like *Taj* (Cinnamon variety) exhibiting a reddish type [8, 13, 17]. *Discoridos* said the best variety is blackish, brown or red in colour, smooth and which attached to its shoot, having sweetness, with minor salty taste and develops irritation on tongue. It is not much brittle and the odour of the barks dominates all other odour [4, 8, 13]. The Unani physicians illustrate different varieties of Darchini on the basis of place and organoleptic characters. The *Moluson* variety refer to best among all varieties, it is thin, smooth, reddish in colour and have a strong odour, sweetness and develops irritation on tongue. Other variety *Jabli* which is thick, small, like yaquti colour [8, 13, 17].

2.1 Vernacular names [11, 13, 18]

Arabic- Darsini, Qirfa, Persian- Darchini, Bengali- Darchini, Daruchini, Darchini, Qalami Darchini, English- Cinnamon Bark, Chinese cassia, Cinnamon, Cylon Cinnamon Hindi- Dalchini, Darchini, Kannada- Dalchini Chakke, Kashmiri- Dalchini, Dalchin, Malayalam- Karuvapatta, Ilavarngathely, Punjabi- Dalchini, Darrchini, Sanskrit- Darusita, Tvaka, Tamil- Lavangapatta, Karuvapattai, Telegu- Lavangapatta, Dalchini chekka, Urdu- Darchini.

2.2 Parts used: Bark and oil [8, 13, 17].

2.3 Mizaj: Hot 2° and Dry 2° [12-13], Hot and Dry 3° [8, 19].

2.4 Dose: 1-2 gm [12, 18].

2.5 Afa'l (Pharmacological actions)

Hazim (Digestive), *Kasir-e-Riyah* (Carminative), *Muqawwi-e-*

Meda (Stomachic) [4, 6, 9-11].

Muqawwi-e-jigar (Liver tonic), *Mufatteh* (Deobstruent)

Mohallil (Anti-inflammatory) [6, 9-11].

Mulattif (Demulcent) *Moharrik-e-Bah* (Sex stimulant), *Mufarreh* (Exhilarant) [4, 8, 11-13, 20].

Mudirr-e-Baul (Diuretic), *Mudirr-e-Haiz* (Emmenagogue) [6, 9-11]. *Mujaffif* (Desiccant), *Musakkin* (Calorific), *Daf-e-Taffun* (Antiseptic) [4, 8, 11-13, 19-22]. *Muharrik* (Stimulant), *Jazib* (Absorbefacient), *Zali* (Detergent), *Qabiz* (Astringent), *Munaffis-e-Balgham* (Expectorant) [4, 8, 11-13, 20].

3. Istemal (Therapeutic usages)

- Darchini, or cinnamon, enhance appetite, and correct stomach weakness resulting from excessive moisture and cold conditions, alleviate stomach pain and flatulence, and gives relief in cases of Waram-e-meda (gastritis). When combined with *Mastagi* (*Pistacia lentiscus*), it is also effective in treating hiccups [8, 11-13, 17].
- It is good for liver and used in different diseases of liver like *Warame jigar* (hepatitis), *Yarqan* (jaundice) and *Istisqa* (ascitis) and *Istisqa-lahmi* (anasarca). Darchini also support liver health due to its specific properties [8, 11-13, 17].
- Darchini provides relief in renal colic and is beneficial conditions like *Usrul-bol* (dysurea), *Ehtebas Haiz* (Amenorrhoea) [8, 11-13, 17].
- A mixture of Darchini with *Roghan zaitoon* (olive oil), animal fat, beeswax (mom), and the yellow part of an egg is used as a topical application (*Farjaza*) for uterine diseases. [8, 12, 17].
- Local application of Darchini along with honey eliminates black spots, dark circle, it is also beneficial for skin conditions like *Bars* (vitiligo) and *Behak* (pityriasis). It promotes fairness and treats acne when used as a face pack. Additionally, it aids in the healing of wounds and ulcers. [4, 8, 12-13, 17].
- Darchini, when combined with *Halela Kabli* (*Terminalia chebula*), enhances memory and is effective for relieving headaches caused by cold conditions [8, 12-13, 17].
- It is beneficial for *Zukaam* (common cold), *Khansi* (cough) and *Zat-ul-janab* (pleurisy), *Tap larzah* (fever with rigors) [8, 12-13, 17].
- Darchini has supportive effect in treating *Khafqan* (palpitation) [8, 11-13, 17].
- Darchini provides relief for *Waja-ul-alam* (arthalgia) and *Waja-ul mafasil* (joint pain). Rogan Darchini is also beneficial for relieving joint pain and effective in *Rasa* [8, 12, 17].
- Darchini is beneficial for eyes, it can be used either orally or locally to the eyes in the often in the form of *Surma*, rogan (oil) Darchini gives relief in earache [8, 12, 17].
- It is helpful for treating scorpions' bites and another insects bite [8, 12-13, 17].

4. Famous compound Formulations

Jawarish Jalinoos, Majoon Dabeed-ul-warad, Jawariszaraoni, Majoon Falasfa, Arq-e-Chob- Chini, Dawa-ul-Misk Motadil Jawahar Wali, Tila-e-Darchini [18, 23].

5. Chemical constituents

Cinnamon bark contains about 0.5-1.0% of volatile oil, 1.2% of tannins (Phlobatannin), mucilage, calcium oxalate, starch and a sweet substance known as mannitol [2]. The volatile oil is active constituent of drug. It is light yellow in colour and changes to red on storage. Bark yields 14-16% of 90%

alcohol soluble extractive. Cinnamon oil contains 60-70% cinnamaldehyde, 5-10% eugenol, benzaldehyde, cuminaldehyde and other terpenes like phellandrene, pinene, cymene, α -humulene, δ -cadinene, caryophyllene, and limonene etc [2, 15].

6. Scientific Studies

6.1 Anti-inflammatory activity

A study was carried out by Joshi K. *et al.*, they investigated its anti-inflammatory activity using ethanol extract obtained from bark. *In vitro* and *in vivo* experiments were performed targeting TNF- using flow cytometry. Ethanol extract of *C. zeylanicum* showed suppression of intracellular release of TNF- in murine neutrophils as well as leukocytes in pleural fluid. The extract was found to inhibit TNF- gene expression in LPS-stimulated human PBMCs at 20 μ g/ml concentration [24].

6.2 Hepatoprotective activity

A study conducted by Ekram Eidi *et al.*, investigated the effects of cinnamon extracts on carbon tetrachloride (CCl₄)-induced hepatotoxicity in male Wistar rats. The rats were administered different doses of cinnamon extracts (0.01, 0.05, and 0.1 g/kg) for a period of 28 days. The researchers observed that the cinnamon extracts significantly reduced the impact of CCl₄ toxicity on various serum markers of liver damage [9].

6.3 Hepatoprotective and Nephroprotective activity

A study was carried out by H Zulfi *et al.*, hepatotoxicity and nephrotoxicity in mice developed by Acetaminophen mice were pretreated with cinnamon bark aqueous extract (200 mg/kg/day i.g.) 14 days prior to intra-gastrically administer single toxic dose of acetaminophen (200 mg/kg). The results found that cinnamon aqueous extract exhibit a highly significant preventive potential by ameliorating APAP-induced elevated levels of serum alanine aminotransferase, aspartate aminotransferase, creatinine, urea and macroscopic and histological alterations in liver and kidney [10].

6.4 Wound Healing Activity

A study conducted by Farahpour MR. *et al.*, investigate the effect of *Cinnamomum zeylanicum* on experimentally induced excision wounds in rats. Thirty-two rats were divided into four groups of eight rats each. Group A received a placebo containing 0.75% cinnamon, Group B received a placebo containing 1.5% cinnamon, Group C as a control group did not receive any treatment, and finally, Group D received blank placebo; Groups C and D were considered as one group (standard). The results were taken on days 3, 7, 14 and 21 and a histological evaluation was also carried out on the samples. Cinnamon extract may have contributed to the acceleration of the wound healing process in the treated groups compared to the control group [15].

6.5 Antioxidant activity

A study carried out by Filho JM, *et al.*, In this study where the antioxidant activity of different cinnamon extracts (etheric, methanolic, and aqueous) was evaluated using the b-carotene/linoleic acid system at 50 degrees Celsius. The absorbances were measured at 470 nm every 15 minutes over a 120-minute period. Two controls were used: one with a synthetic antioxidant (butylated hydroxytoluene, BHT, at 100 ppm) and another without any antioxidant. The results indicate that the etheric, methanolic, and aqueous cinnamon

extracts inhibited the oxidative process by 68%, 95.5%, and 87.5%, respectively. These findings suggest that cinnamon extracts possess significant antioxidant properties [26].

The methanolic extract of cinnamon contains antioxidant compounds that can efficiently neutralize various reactive oxygen species, such as superoxide anions and hydroxyl radicals, along with other free radicals, in controlled laboratory conditions [27].

6.7 Antidiabetic activity

A research study was conducted by Choung SY *et al.*, in a type II diabetic animal model Cinnamon extract was administered at different dosages (50, 100, 150 and 200 mg/kg) for 6 weeks. It was found that blood glucose concentration is significantly decreased in a dose-dependent manner ($p < 0.001$) with the most in the 200 mg/kg group compared with the control. In addition, serum insulin levels and HDL-cholesterol levels were significantly higher ($p < 0.01$) and the concentration of triglyceride, total cholesterol and intestinal α -glycosidase activity were significantly lower after 6 weeks of the administration [28]. Another study also proves the antidiabetic activity of cinnamon [29].

6.8 Antiulcer effects

A study conducted by Alqasoum *et al.*, to assess the gastric antisecretory and antiulcer properties of *Cinnamomum zeylanicum* (cinnamon) in rats. The aqueous suspension of cinnamon was tested using various rat models, including pylorus ligation, necrotizing agents, and indomethacin-induced ulceration. The effects on gastric acid secretion, ulceration, and histopathological changes were evaluated, along with measurements of gastric wall mucus and nonprotein-sulfhydryl contents. Results indicated that cinnamon suspension reduced basal gastric acid secretion and prevented ruminal ulceration in pylorus-ligated rats. It also effectively inhibited gastric haemorrhagic lesions induced by different agents like ethanol, sodium hydroxide, and sodium chloride. Additionally, the cinnamon suspension demonstrated antiulcer activity against indomethacin-induced ulcers [30].

6.9 Antihypertensive activity

In a rat model study by Wansi SL *et al.*, the ethanol extract from *Cinnamomum zeylanicum* bark demonstrated significant hypotensive effects on both normotensive rats (NTR) and salt-loaded hypertensive rats (SLHR). The observed hypotensive activity occurred in two distinct phases. The first phase is likely attributed to the extract's impact on enhancing cardiac pump efficiency, while the second phase is associated with stimulation of M₃-muscarinic receptors, leading to vasodilation [31].

6.10 Antimicrobial activity

A study conducted by Carmo *et al.*, the study reported MIC₅₀ and MIC₉₀ values of 40 and 80 μ L/mL, respectively. This indicates the concentrations at which the essential oil could inhibit the growth of *Aspergillus* strains. Different concentrations of the essential oil (80, 40, and 20 μ L/mL) strongly inhibited the radial mycelial growth of *A. niger*, *A. flavus*, and *A. fumigatus* over a period of 14 days. The study concludes that *C. zeylanicum* essential oil has the potential to be recognized as a potent antifungal compound, particularly effective against the growth of *Aspergillus* species. The findings suggest that the essential oil could be considered for

use in protecting against Aspergillus-related issues [32].

7.1 Hypolipidemic activity

A study was carried out by Abdelgadir AA *et al.*, in this study hyperlipidemia developed in rat by Triton X-100, the results of this study revealed that *C. zeylanicum* ethanol extract has a hypolipidemic effect on hypercholesterolemic albino rats by decreasing serum total cholesterol and triglyceride levels [33].

8. Conclusion

This review shows that Darchini, is an important medicinal as well as spice plant, mainly cultivated, in Sri Lanka (formerly Ceylon), the Malabar Coast of India, and Myanmar (Burma). it is used since ancient time in Asia and many other countries as spice., it is widely used as a spice in India. Beyond its culinary applications, cinnamon is utilized in home remedies due to its broad therapeutic value. In Unani medicine, it has been successfully used as Liver tonic, Stomachic, Appetizer Carminative, Antiseptic, Deobstruent drug. Scientifically, it has demonstrated some pharmacological activities, and some are yet to be evaluated. However, despite the existing knowledge, further comprehensive phytochemical and pharmacological studies are warranted to delve deeper into the details of its composition and actions. It is recommended that preclinical and clinical studies should be conducted in order to prove its other actions which are still scientifically unexplored.

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