Cinnamon: A Magical Drug

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ABSTRACT
Cinnamon is used as a spice in our day to day life. It is aromatic. It is principally employed in cookery as a condiment and flavoring agent. It has been acquainted as one of the healthiest spices and has medicinal activity. When it is checked for chemical constituents it reveals phenolic flavonoid and carotenoid contents. They contain rich amount of polyphenols which are powerful antioxidants. It inhibits the growth of certain bacteria and fungi. It helps to reduce the blood glucose by increasing insulin in the body by the mechanism of resisting insulin depletion. It interferes with carbohydrate digesting enzyme and reduces degradation of carbohydrate as a result of which it decreases entry of glucose from intestine to blood stream. It reduces the growth of cancer cells. ‘N’ number of pharmacological investigations confirmed that the ability of this plant is to exhibit hepatoprotective, neuroprotective and cardioprotective action. This present article will provide you with detailed information on the most of the aspects of cinnamon

Keywords: Cinnamon, Antidiabetic, Antioxidant, Hepatoprotective, Anticancer.

INTRODUCTION
The botanical name of cinnamon is cinnamomum zeylanicum and the source is dried bark stem. It belongs to the family Lauraceae. It contains not less than 1% v/w volatile oil. It is commonly called as cinnamon, in French-cannelier, German-Zimtbaum, Italian-canella, portugese-caneleira, Spanish-canelo, India-Dalchini or karuvappadai in Tamilnadu. It is also known as Ceylon cinnamon or true cinnamon. It is exclusively available in cultivated plants. Since cinnamon is a dried stem bark the upper surface is blackish brown in colour and lower surface is reddish brown in colour. It is aromatic sweet in odour and taste. Shape is channeled or compound quills. Its length is upto 40cm. It is slightly fibrous in the inner part. The main constituent of volatile oil is cinnamic aldehyde (75-90%).

Chemical composition:

<table>
<thead>
<tr>
<th>Part of the plant</th>
<th>Chemical constituents of different parts of cinnamon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaves</td>
<td>Cinnamaldehyde: 1.00 to 5.00%</td>
</tr>
<tr>
<td></td>
<td>Eugenol: 70.00 to 95.00%</td>
</tr>
<tr>
<td>Bark</td>
<td>Cinnamaldehyde: 65.00 to 80.00%</td>
</tr>
<tr>
<td></td>
<td>Eugenol: 5.00 to 10.00%</td>
</tr>
<tr>
<td></td>
<td>Root bark Camphor: 60.00%</td>
</tr>
<tr>
<td>Buds</td>
<td>Terpene hydrocarbons: 78.00%</td>
</tr>
<tr>
<td></td>
<td>alpha-Bergamotene: 27.38%</td>
</tr>
<tr>
<td></td>
<td>alpha-Copaene: 23.05%</td>
</tr>
<tr>
<td></td>
<td>Oxygenated terpenoids: 9.00%</td>
</tr>
<tr>
<td></td>
<td>C. zeylanicum</td>
</tr>
<tr>
<td>Flowers</td>
<td>(E)-Cinnamyl acetate: 41.98%</td>
</tr>
<tr>
<td></td>
<td>trans-alpha-Bergamotene: 7.97%</td>
</tr>
<tr>
<td></td>
<td>Caryophyllene oxide: 7.20%</td>
</tr>
<tr>
<td>Fruits</td>
<td>trans-Cinnamyl acetate (42.00 to 54.00%)</td>
</tr>
<tr>
<td></td>
<td>and caryophyllene (9.00 to 14.00%)</td>
</tr>
<tr>
<td></td>
<td>C. zeylanicum</td>
</tr>
</tbody>
</table>

Other compounds which are present in lesser percentages those are cinnamic acid, Hydroxyl cinnamaldehyde, Cinnamyl alcohol, Coumarin, Borneol etc.

How to cite this article: Nayak P; Cinnamon: A Magical Drug; PharmaTutor; 2017; 5(4); 38-41
ANTIMICROBIAL ACTIVITY
Various articles have reported the antimicrobial activity of cinnamon in their earlier studies. The combination of cinnamon and clove oil is effective against a wide range of organisms. The organisms which are affected are Gram negative bacteria (E. Coli, Pseudomonas aeruginosa, Yersinia enterolitica, Salmonella choleraesuis) and Gram positive organisms (Enterococcus facelis, Listeria monocytogenes, Bacillus cereus, staphylococcus aureas). These works were done by Goni et al.

20 Bacteria and 4 candida sps were destroyed by the antimicrobial activity of cinnamon which is obtained from bark. This activity has also found use against oral microorganisms. Recently Parthasarathy and Thombare reported that the aqueous extract of cinnamon, Azadirachta indica and syzigium aromaticum have activity against oral microorganisms. But the oil obtained from it has more antimicrobial activity than S.aromaticum and A.indica. Various other scientists experimented for the antimicrobial activity and all indicated to the point that cinnamon oil is effective against both Gram positive and Gram negative microorganisms.

ANTIDIABETIC ACTIVITY
“Insulin-potentiating factor was the word coined for the compound which was obtained from cinnamon bark. Some of the scientists concluded that other species of cinnamon have insulin potentiating factor 20 times lesser than that of C.Zeylanicum. Anderson et al isolated and characterized the polyphenol type-A polymers which acts like insulin which helps in the antidiabetic action of cinnamon.

Since cinnamon possess alpha glucosidase inhibiting property, it shows decrease in postprandial hyperglycemia in rats which is induced by streptozotocin. It shows reversible and competitive inhibition. It helps to reduce serum glycosylated Hemoglobin (HbA1C) in type 2 diabetes mellitus with the value over 7. Cinnamon intake daily would decrease fasting blood glucose level.

To check whether cinnamon helps in reducing blood glucose level Lu et al. examined a total of 66 patients with type-2 diabetes mellitus and were divided into 3 groups: placebo, low dose and high dose of cinnamon extract. The patients were also given with Gliclazide. Patients receiving both the doses showed less fasting blood glucose level than the patients receiving placebo.

CARDIOPROTECTIVE ACTIVITY
Cinnamon is obtained from the leaves and has the hypotensive effects. Cinnamophyllin is obtained from Cinnamomum philippinensis and is a potent TXA2 receptor antagonist. In TXA2 disorders such as platelet aggregation this can be useful.

Amin et al identified the activity of cinnamon and atorvastatin Hepatic enzyme activity, antioxidant capacity, nitric oxide etc. NO values and antioxidant activity where found to be increased in rats which were treated with cinnamon and atorvastatin than untreated. Later cinnamaldehyde and cinnamic acid were isolated from cinnamon cassia. Thus this provides the evidence for the cardioprotective action of cinnamon.

ANTICANCER ACTIVITY
Cinnamaldehyde was synthesized and was tested for inhibition against angiogenesis. When cinnamaldehyde was made to react with ethanolic extract of C.cassia it stimulates Nrf2 levels. Pretreatment also stimulates the cellular GSH levels and protects HCT116 cells against genotoxicity induced by hydrogen peroxide. When combined all the things together cinnamaldehyde is a powerful activator of Nrf2 and may show an unappreciated anticarcinogenic activity.

The site of target for anticancer activity of extract of cinnamon is the vascular endothelial growth factor (VEGF). It is one of the potent natural inhibitor of Nitrogen-activated protein kinase and stat3.
mediated signaling pathway. This helps in the prevention and treatment of cancer. Varalaxmi et al showed that apoptosis was increased on treating with methanolic extract in the human hepatoma cancer cells.

**CONCLUSION**

The various properties, uses, characters of cinnamon were came across in this study of the article. These research and advancements must be reported and must be documented for the future generations for their well being.

**REFERENCES**

18. Jarvill-Taylor KJ, Anderson RA, Graves DJ. A hydroxychalcone derived from cinnamon functions as a mimetic