THE VISHAGHNA PROPERTY OF CHANDANA (SANTALUM ALBUM) IN AYURVEDIC AND CONTEMPORARY SCIENCE: AN OVERVIEW

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ABSTRACT

Ayurveda, the holistic medicine aims to restore the health and understanding the underlying cause of disease and its treatment. Ayurvedic herbs are important component to achieve in treating the diseases. The Concept of Ayurvedic Vishaghna mahakashaya explained by Acharya Charaka have the properties of detoxifying action. The present concept is helps in establishing the bridge between Ayurveda and contemporary science. Chandana, as a single and multiple preparations are available which indicates its utility in many poisonings. All aspects of chandana are studied in detail especially in field of detoxification. Selection of all logical references are done and collection, correlation and explanation as per requirement. It can be useful for disease which comes under area of any field of toxicity.

Hence, we can prevent and treat many toxicological disorders. On the basis of concept of vishaghana properties of chandana, it can be broadly used in today’s era for preventive as well as curative disease-free life from toxicological agent.

KEYWORDS: Ayurveda, Chandana, Detoxifying, Vishaghna.

INTRODUCTION

One of the famous Traditional systems of medicine is the Ayurveda system of medicine since antiquity. Having importance to herbal plants and its therapeutic usage for treating the
diseases. *Chandana*, one among the *Vishaghna mahakashayas* mentioned by Acharya Charaka.\(^1\) Each drug of *Vishaghna mahakashya* is chief ingredient of many classical preparation and *agada* preparation (Anti-poisonous ayurvedic preparation) which has large area of therapeutic uses. Pharmacological properties of drug *chandana* is having broad spectrum in the field of Ayurvedic and contemporary science.

Santalum album is commonly known as white sandalwood, it is one of the most valuable trees and second costliest wood in the world. Sandalwood and its oil are extensively used in the traditional systems of medicine as it has blood purifier, anti-inflammatory, analgesic, exhilarant, cardiotonic, antiseptic, nerve tonic and expectorant properties. It is used in skin, cardiac, liver, gastrointestinal, respiratory, integument and urogenital disorders. These uses are supported and proven by many in vitro or in vivo studies. The proven pharmacological activities of S. album are antimicrobial, anti-oxidant, anti-inflammatory, antimutagenic and anti-fatigue.\(^2\)

**Common Discription & Scientific classification of chandana**\(^3\)

Chandana consists of dried heart wood of Santalum album Linn. an evergreen, semiparasitic tree, 8 to 18m in height and 2 to 4 m in girth, widely distributed in the country, commonly found in the dry regions of peninsular India from Vindhya mountains southwards, especially in Karnataka and Tamilnadu, it is cultivated for its aromatic wood and oil.

Kingdom: Plantae  
Class: Tracheophytes  
Subclass: Angiosperms  
Order: Santalales  
Family: Santalaceae  
Genus: Santalum  
Species: S. album

**Table 1: General & Vishaghna classifications of chandana in various ayurvedic literature.**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Ayurvedic literature</th>
<th>General classification</th>
<th>Vishaghna classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Charaka Samhita</td>
<td>Varnya(^4)</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kandughna,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trishnanigrahana(^5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dahaprashamana(^6)</td>
<td></td>
</tr>
</tbody>
</table>

\(^{1}\) Acharya Charaka  
\(^{2}\) Kumar V, Manjari K, Kamal P, Jyoti G.  
\(^{3}\) Shreeraksha et al.  
\(^{4}\) Varnya is the classification of Chandana in Ayurvedic literature.  
\(^{5}\) Trishnanigrahana is a known poisons in Ayurvedic literature.  
\(^{6}\) Dahaprashamana is a known poisons in Ayurvedic literature.
Table 2: Ayurvedic pharmacodynamics of chandana.\textsuperscript{[15]}

<table>
<thead>
<tr>
<th>Sl. no.</th>
<th>Rasapanchaka</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rasa</td>
<td>Tikta, Madhura</td>
</tr>
<tr>
<td>2</td>
<td>Guna</td>
<td>Laghu, Ruksha</td>
</tr>
<tr>
<td>3</td>
<td>Veerya</td>
<td>Sheeta</td>
</tr>
<tr>
<td>4</td>
<td>Vipaka</td>
<td>Katu</td>
</tr>
<tr>
<td>5</td>
<td>Dosha Prabhava</td>
<td>Kaphapittahara</td>
</tr>
<tr>
<td>6</td>
<td>Pharmacological action</td>
<td>Dahaprashamana, varnya</td>
</tr>
</tbody>
</table>

Chemical composition of santalum album\textsuperscript{[16]}

Chandana, the major source of costliest wood and essential oil has been extensively investigated for its chemical constituents. Major constituents of sandalwood oil are sesquiterpene alcohols like $\alpha$-and $\beta$-santalols. Minor constituents bergamotols and several of their stereoisomers, whereas minorconstituents includes lanceol, nuciferol, bisabolol and the sesquiterpene hydrocarbons such as $\alpha$-and $\beta$-santalols.

Table 3: Therapeutic vishaghna Yoga and Agada preparation of chandana.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Mention</th>
<th>Name</th>
<th>Indication</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Charaka</td>
<td>Mritisanjeevana agada</td>
<td>Sarva visha</td>
<td>C.S.Chi.23/54-60</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Mahagandhahasti agada</td>
<td>Visha</td>
<td>C.S.Chi.23/77-94</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Kshara agada</td>
<td>Sarva visha</td>
<td>C.S.Chi.23/95-104</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Vajradi agada</td>
<td>Sarva visha</td>
<td>C.S.Chi.23/191-192</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Sarvakarmika agada</td>
<td>Lutha visha</td>
<td>C.S.Chi.23/200-201</td>
</tr>
<tr>
<td>6</td>
<td>Sushrutha</td>
<td>Ajeya Gritha</td>
<td>Sarva visha</td>
<td>Su.ka.2/48-49</td>
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<tr>
<td>7</td>
<td></td>
<td>Tarkshya agada</td>
<td>Sarpa visha</td>
<td>Su.ka.5/65-68</td>
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<tr>
<td>8</td>
<td></td>
<td>Kalyanaka Gritha</td>
<td>Bhuta visha</td>
<td>Su.ka.6/8-11</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Chandandi agada</td>
<td>Lootha visha</td>
<td>Su.ka 8/103-104 &amp; 111</td>
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<tr>
<td>10</td>
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<td>Chandandi agada</td>
<td>Keeta visha</td>
<td>Su.ka.8/116-119</td>
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<tr>
<td>11</td>
<td>Vagbhata</td>
<td>Lodradi modaka</td>
<td>Visha</td>
<td>A.S.U.48/20</td>
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<tr>
<td>12</td>
<td></td>
<td>Mahasughandha agada</td>
<td>Visha</td>
<td>A.S.U.47/23</td>
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<tr>
<td>13</td>
<td></td>
<td>Chandanasadhita ksheera</td>
<td>Vishaja chardi</td>
<td>A.S.U. 47/ 7</td>
</tr>
</tbody>
</table>
1. **Analgesic & Anti-inflammatory activity:** This study evaluated the methanolic extract of Santalum album wood for analgesic and anti-inflammatory activities at various doses. The analgesic and anti-inflammatory effect of extract was compared with diclofenac sodium (7 mg/kg) as the standard. The maximum effect of the extract was seen at 500 mg/kg.\(^{[17]}\)

2. **The antibacterial activity:** The antibacterial properties of the five different extracts of sandalwood and sandalwood oil were evaluated. The extracts were screened against nine Gram-negative and five Gram-positive bacterial strains by disc diffusion, agar spot, and TLC bio-autography methods. And the extracts showed the strongest antibacterial activity.\(^{[18]}\)

3. **Insecticidal activities:** Sandalwood oil acts as a repellent against Varroa jacobsoni in honey bee colonies thus used as an acaricide.\(^{[19]}\)

4. **Genotoxicity effects:** The DNA damaging activity of sandalwood oil in Bacillus subtilis was studied and was found to be non-genotoxic.\(^{[19]}\)

5. **Cardioprotective activity:** Aqueous extract of sandalwood reported to inhibit significantly the cardiac tissue damage by reducing lipid peroxidation on doxorubicin induced cardiotoxicity in rat model and significant protective effect against ISO induced myocardial infarction in albino Wistar rats in dose dependent manner.\(^{[19]}\)

6. **Anticancer activity:** Investigations have shown the chemo-preventive effects and molecular mechanisms of \(\alpha\)-santalol on skin cancer development in both animal models and skin cancer cell lines.\(^{[19]}\)
7. **Antioxidant efficacy**: It has been reported to have nitrous oxide scavenging activity and DPPH antioxidant activity. Santalum album can protect cardiac tissue from oxidative stress induced cell injury and lipid peroxidation and also interferes with DOX-induced inflammatory and apoptotic induction in cardiac tissue.[19]

8. **Neuroprotective activity**: Concluded that Santalum album shows neuroprotective effect against septic encephalopathy via reduction of oxidative stress and improvement in learning and memory, neurological severity score and exploratory behavior. Suggests that Santalum album may have beneficial effects in septic encephalopathy by improving biochemical, behavioral changes.[20]

9. **Antiaging activity**: The antiaging assay showed that Ximenynic acid isolated from the seeds of Santalum album exhibited significant collagenase inhibition activity.[21]

10. **Anti-diarrheal activity**: At doses of 200, 400 and 800 mg/kg, Sandalwood Extract showed significantly anti-diarrheal activity against castor oil-induced diarrhea as compared with the control.[22]

**DISCUSSION**

*Chandana* been used as a prominent content in many *Agada* (antitoxic) preparations in our classical literature. These *Agada* are mainly used for different types of toxic bites such as *Sarpa, luta, keeta* and *sarva visha* conditions etc. *Agada* is a multi-Herbo-mineral drug preparation which indicates in various types of poisoning. *Chandana* being one among *Vishaghna mahakashaya dravya* will show the antitoxic effect by neutralizing toxin, denaturizing toxin and helps to release toxin outside from the body at the cellular level. In recent researches, it is found that chandana have anti-inflammatory, analgesic, anti-microbial, anti-oxidant effects also. It is may be beneficial integrated concept for metabolic toxicity, substance acquired acute and chronic toxicity, biological toxicity, cumulative toxicity etc. and it also help to understand the detoxifying phenomenon.

**CONCLUSION**

Chandana is said to be a best Vishaghna drvaya which can be used in all types of toxicity. The Vishaghna references of chandana are obtained in all brihatrayis. Also, in recent research studies of different activities of chandana like anti-inflammatory, analgesic, anti-microbial,
immune-modulator etc. are proved. Hence, chandana can be easily used in today’s era for preventive as well as curative disease and make the life free from toxicological agents.

REFERENCES