Ayurvedic And Modern Therapeutic Aspect Of Lavang Tail

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Abstract

Lavang (Syzygium aromaticum) has antimicrobial, anti-inflammatory, anti-oxidant properties as well as anti-carcinogenic, anti-mutagenic properties. According to Ayurveda lavang has tikta and katu rasa and sheet virya. Due to katu rasa it acts as kaphashamaka and pitta hara, due to sheetaveerya. Therefore, lepa (local application of paste) of lavang is applied on forehead in pratishyayjanyashirshool (sinusitis induced headache). It acts as uttejak (aphrodisiac) in dhvajbhang (erectile dysfunction) due to its tikshnaguna. It also acts as krumighna (wormicidal) therefore it is used in dantshool (dental carries). In vyadhis (diseases) like amvaatkatishoolgudhrasi local application of lavang tail reduces the pain. Due to its tikshnaguna, the salivary secretion increases and also the fibroblastic activity of mucus membrane ceases. Hence it can be used in oro-dental conditions like sub mucus fibrosis as it increases fibroelastic activity of cell. Clove has two major chemical components, Eugenol and Beta Caryophyllene, which constitute 78% and 13% respectively. Both have cytotoxic property towards human fibroblasts and endothelial cells. Clove also has been effective in inhibition of cell proliferation in carcinogenesis. Eugenol also helps in inhibition of fungal growth. The leaves of clove contain betulinic acid, which also has cytotoxic property in certain cancers like breast cancer. This study aims at the therapeutic use of clove indicated in Ayurvedic literature and research studies conducted on the same. Comprehension of such literature is need of an hour for further clinical trials.

Keywords – Lavang tail, Chemical constituents, Therapeutic uses

Introduction

According to kalidasa (Ancient Ayurveda Acharya), lavangpushpa (clove flower) are firstly found in dvipantara i.e. island [1]. In Charak and Sushrutsamhita the therapeutic use of lavang indicated with tambulsevana (betal leaf chewing). It is kaphachchedak and pitta shamak. That’s why it is used in Indian spices. Lavang has great antioxidant property. Clove actually means symbol of dignity. It is unopened flower bud growing on a tree belonging to Myrtaceae family. It is native of Indonesia but now days cultivated in several part of world. It contains phenolic compounds such as euginol, eugenol acetate, gallic acid which are having great pharmaceutical and cosmetic uses. Clove is beneficial home remedy for several diseases. It possess antioxidant, anti-fungal, anti-viral, anti-microbial, anti-diabetic, anti-inflammatory, anesthetic, pain reliving, insect repellent properties.

1.1 Aims – Ayurvedic and modern therapeutical aspects of lavang tail
1.2 Objectives –
   1. To collect and analyze the literature review of lavanga
   2. To collect and analyze chemical component of lavang and its effect on body
   3. To study the therapeutic uses of lavang.

1.3 Methodology
To fulfill the aims and objectives of the study this work has been carried out in the following phase wise manner.
   1. Conceptual study
   2. Comparative study
   3. Discussion
   4. Conclusion and summary

2.1 Clove synonyms -
   Sanskrit names - devkusuma, devapuspa, lavanga, sriprasun, chandanpushpak, vaareej.
   English names – clove, clovos, caryophyllus, carophyllus
   Botanical names – Eugenia caryophyllus, Syzygiumaromaticum. 
   Family –Myrtaceae
   Hindi –lavang, laung
   Marathi –lavang
   Malayalam –grampu, karayampu
   Kannada –krambu, daevakusuma, lavanga
   Tamil –kirampu, kiraambu, grambu
   Bengali –lavanga
   Gujarati –lavang
   Oriya-labanga
   Urdu-laung

2.2 Phylotaxy of Clove tree-
   Height - 30-40 feet in hight,
   Leaves-Oval shaped green leaves of 3-6 inch in length
   Flowers – Aromatic, Lavender colored
   Fruits- Clove like shape, Named as mother clove
   Clove buds- In dry form used as spices

2.3 Collection-
   After 7-8 years of age there is formation of buds.
   Developing clove buds are collected before they get full grown.

2.4 Time of collection-
   When clove buds turn pinkish from green color.
   A tree yields 2.5 – 4.5 kg clove at one time.
   These immature clove buds then dried for 4-5 days in sunlight. And then used.

2.5 Nutritive value of clove:

<table>
<thead>
<tr>
<th>Content</th>
<th>Nutrient value per 100gm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>5.98gm</td>
</tr>
<tr>
<td>Fat</td>
<td>20.07gm</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>61.21gm</td>
</tr>
</tbody>
</table>
Energy 323 kcal
Calcium 646 mg
Phosphorous 105 mg
Iron 8.64 mg
Carotin 84 mcg
Thiamine 0.115 mg
Riboflavin 0.267 mg
Niacin 1.458 mg
Folates 93 mcg
Copper 0.347 mg
Magnesium 264 mg
Manganese 30.033 mg
Zinc 1.09 mcg
Potassium 1102 mg
Sodium 243 mg
Vit A 530 IU
Vit C 80.8 mg
Vit E 8.52 mg
Vit K 141.8 mcg

3.1 Ayurvedic properties-

Guna- snigdha, laghu
Rasa- tikta, katu
Vipak- katu
Veerya- sheet
Karma- due to tiktkatu rasa it is kapheshamak, due to its sheet veerya it is pitta shamak

3.2 Local action- Due to its tikshnaguna it is raktotkleshak(blood agrevator), uttejak(stimulant), krimighna(wormicidal)

3.3 Internal action[31]-

<table>
<thead>
<tr>
<th>No</th>
<th>System</th>
<th>Guna</th>
<th>Karma</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Digestive</td>
<td>Katu, tikta rasa</td>
<td>Deepa$pachan$(appetizer), ruche vardhan(taste improver)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teekshaguna</td>
<td>Salivary secretion increases</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Snigdhabhuna</td>
<td>Vatanulomak(caminative), shoolprashamak(analgesic)</td>
</tr>
<tr>
<td>2</td>
<td>Circulatory</td>
<td>Tikta rasa</td>
<td>Raktadushitanasha(blood purifier)</td>
</tr>
<tr>
<td>3</td>
<td>Respiratory</td>
<td>Katutikta rasa</td>
<td>Shleshmaputihar(mucolytic)</td>
</tr>
<tr>
<td>4</td>
<td>Reproductive</td>
<td>Prabhav</td>
<td>Vajikaran (aphrodisiac).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Katuvipak</td>
<td>Stanyajanan(lactogenic).</td>
</tr>
<tr>
<td>5</td>
<td>Excretory</td>
<td>Prabhav</td>
<td>Mutrajanan (diuretic).</td>
</tr>
<tr>
<td>6</td>
<td>Fever</td>
<td>Tikta rasa</td>
<td>Jwaraghna(antipyretic)</td>
</tr>
</tbody>
</table>
3.4 Therapeutic uses by Samhitas[4] –#

1. *Shirshooljanya pratishay* (sinusitis induced headache) – Local application of lepa on forehead
2. *Mukharoga,kantharoga* (orodental disorder) – Chewing of clove
3. *Aamvata* (Rheumatoid Arthritis), *katishool* (Backache), *grudhrasi* (Sciatica), *vaatvikar* (Neurological Disorder) – Clove oil massage for local pain relief
4. *Dantshool* (Toothache) – Cotton plug of lavang tail
5. *Dhvajbhang* (Erectile Dysfunction) – Oil application on penis for aphrodisiac action
7. *Kaas, shwas, hikka* (respiratory disorder)
9. *Firang, upadansha* (soft chancre) – *raktadushtinaash* (purification of vitiated rakta)
11. *Koshnajalapishtvalepa* (local application of paste) - In *vaatvikara* (Neurological Disorder) for pain relief.

4.1 Chemical composition of clove-

Clove contains volatile and non volatile constituents[6].

4.2 Volatile constituents -

<table>
<thead>
<tr>
<th>Clove part</th>
<th>Constituent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bud oil</td>
<td>Essential oil - 15-20%</td>
</tr>
<tr>
<td></td>
<td>Euginol - 70-85%</td>
</tr>
<tr>
<td></td>
<td>Euginol acetate - 15%</td>
</tr>
<tr>
<td></td>
<td>Beta caryophyllene - 5-12%</td>
</tr>
<tr>
<td></td>
<td>Methylamylketone, Methylsalicylate-responsible for odour of clove</td>
</tr>
<tr>
<td>Leaf oil</td>
<td>Essential oil – 3.0-4.8%</td>
</tr>
<tr>
<td></td>
<td>At different stages of leaf growth euginol content increases from 38.3 to 95.2%</td>
</tr>
<tr>
<td></td>
<td>WhereasEugynyl acetate decreases from 51.2 to 1.5 % and caryophyllene from 6.3 to 0.2%</td>
</tr>
<tr>
<td>Clove stem</td>
<td>Essential oil- 6%</td>
</tr>
<tr>
<td>oil</td>
<td>Euginol- 80.2%</td>
</tr>
<tr>
<td></td>
<td>Beta caryophyllene- 6.6%</td>
</tr>
<tr>
<td>Fruit oil</td>
<td>Essential oil- 2%</td>
</tr>
<tr>
<td></td>
<td>Euginol – 50-55%</td>
</tr>
</tbody>
</table>

4.3 Nonvolatile constituents-

<table>
<thead>
<tr>
<th>Constituents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tannins</td>
<td>Tannin 10-13% isolated from clove</td>
</tr>
<tr>
<td></td>
<td>Eugenin, ellagittannin isolated from clove</td>
</tr>
<tr>
<td></td>
<td>Euginolglucosidegallate, Chromone C-glycoside isolated from leaves</td>
</tr>
</tbody>
</table>
Syzyginn A, syzyginn B isolated from leaves

<table>
<thead>
<tr>
<th>Triterpenes</th>
<th>Clove contains Triterpines and oleanolic acid 2%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maslinic acid isolated from clove buds</td>
</tr>
<tr>
<td></td>
<td>2- alpha hydroxyoleanolic acid isolated from clove</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sterols</th>
<th>Sitosterol, stigmasterol and campesterol</th>
</tr>
</thead>
</table>

| Flavonoids           | C-glucoside, isobiflorin isolated from ethinolic extract of cloves |
|                      | Apigenin isolated from ethanol extract of the seeds     |

4.4 Pharmacological uses-

1. **Anti-oxidant activity**- Clove has the highest anti-oxidant property. It has inhibitory effect against hydroxyl radicals and it also act as iron chelator. The anti-oxidant activity of eugenol and eugenolacetate were comparable with alpha Tocopherol like natural anti-oxidants.[7]

2. **Anti-microbial activity**- Clove posses great antiseptic property. Clove oil is effective against *Staphylococcus* species, *Aspergillusniger*, *Klebsiella pneumonia*, *Pseudomonas aeruginosa*, *Clostridium perfringens*, E. Coli and Candida albicans[8]. Euginol is effective against tuberculosis.

3. **Anti-viral activity** - Eugininalso shows antiviral activity against herpes virus at a concentration of 10 mcg/ml[9]

4. **Anti-inflammatory**- Euginol functions as Anti-inflammatory agent. Clove contains large number of flavonoids such as Beta caryophyllene, Rhamnetin which initiate clove’s anti-inflammatory and anti-oxidant properties[10]

5. **Antipyretic**- Euginol, main component of clove oil reduces fever through a central action similar to that of acetaminophen.[11]

6. **Anti-carcinogenic**- It is found that, aqueous infusion of clove reduces lung carc-inogenesis strain in mice. it significantly reduces number of proliferating cells.[12]

7. **Anti-diabetic**- Clove regulates the expression of same genes in similar manner to that of insulin.[13]

8. **Antiplatelet**- It was found that both eugenol and eugenol acetate are potent in inhibiting platelet aggregation.[14]

9. **Anti-stress**- Clove extract found to be usefull in relieving anoxic stress induced convulsions in mice.[15]

10. **Aphrodisiac**- Ethinolic extract of clove found to be effective in increasing sexual sexual activity of normal male rats.[16]

11. **Mosquito repellent**- Clove oil is found to be potent mosquito repellent[17]

12. **Hepato-protective**- Ethinolic extract of clove is found to be hepatoprotective in paracetamol induced liver injury.[18]

13. **Cytotoxic activity**- Clove oil has cytotoxic property towards human fibroblastsand endothelial cells.[19]

14. **Fungicidal activity**- It has been seen that euginol has anti candidial effect in oral candidiasis[20]

15. **Bactericidal activity**- Euginol has bactericidal effect against both positive and negative bacteria like streptococcus pyogenes, proteus vulgaris, Escherichia coli by disrupting their outer membrane[21]

16. **Tooth ache**- Euginol has analgesic effect in dental caries. Clove oil cotton plugs is been used in dental carries traditionally[22]
17. **Anti-ulcer activity**- Clove oil and eugenol are capable of significantly enhancing mucus production therefore they found to be gastroprotective in function. In indomethacin ethanol induced ulcer eugenol displays anti-ulcer activity.[23]

18. **Reducing high fat diet induced obesity**- Eugenol found to effective in downregulation of adipogenic and lipogenic gene.[24]

19. **Anti-carcinogenic in cervical cancer**- Eugenol in clove found to be anti-carcinogenic in breast cancer cells.[25]

20. **Stress**- Clove oil is excellent stress reliever. Having stimulating effect on mind and it removes mental exhaustion and fatigue. It is also helpful in patient suffering from insomnia.[26]

21. **Muscle cramps and headache**- Flavonoids present in clove oil has anti-inflammatory effect in general therefore clove oil is used for muscle cramps and headache.[27]

**Discussion**-

This article basically focus on samhitagranthas reference of lavangaand its therapeutic uses describe in nighantugranthas. Along with that it also focuses on chemical constituents of clove oil and their pharmaceutical actions on human body. Clove has many important systemic effects, such as anti-inflammatory actions, anti-pyretic actions, anti-carcinogenic actions, aphrodisiac action, stress releasing actions. With that also it has aampachaka, krumighna, sheershoolnashak, kaphachedana action due to its unique rasa panchak. It is very important to have some clinical trials on postulated pharmaceutical actions for further studies. So that it will help us to confirm its usefulness in treating patients.

**Conclusion** -

Lavang being a major and most widely spice used in indiansub-continent. It possesseugenol like chemical constituents with many flavonoids which are having large effects on physiology of normal human being. Its tiktakatu rasa makes it best aampachak in various disorders. It acts as vaatshamak due to its sheet veerya. With its krumighnaprabahava it becomes more usefull in orodental disorder. And due to its aromatic flavonoids it act as mukhavaishadyakar. Eugenol and eugenol acetate has great fibroclastic activity on mucosal membrane. Clove is usefull as anti canrcinogenic agent in lung as well as in cervical cancers. So it is very important for us to have sound knowledge of its active principles and their actions. This article concludes that the herb which is described in our nighantugrantha as lavangahas great pharmaceutical applications. And it requires further clinical evaluation of the same.

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