



## THERAPEUTIC AND MEDICINAL USES OF LAVANGA-A REVIEW

## Ayurveda

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## ABSTRACT

Ayurveda means science of life.. Ayurveda is divided into eight branches. Out of all these branches Dravyguna vijnana is one of them. It includes information about herbs which is described in ancient classical text of Ayurveda Among all herbs, *Lavanga* is a well known Ayurvedic herb. *Lavanga* are aromatic flower buds of a tree Latin named as *Syzygium aromaticum* which comes under myrtaceae family. It is known as Lavanga due to its *Kapha* lysing property. According to Ayurveda *lavang* has *tikta* and *katu rasa* and *sheetvirya*. 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 *pratishtayajanyashirshoola* (sinusitis induced headache). It acts as *uttejak* (aphrodisiac) in *dhvajbhag* (erectile dysfunction) due to its *tikshnaguna*. It also acts as *krumighna* (wormicidal) therefore it is used in *dantshool* (dental carries). In *vyadhis* (diseases) like *amvaatkashoolgrudhrasi* 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 fibroclastic activity of cell. It posses other properties such as *Deepana*, *Pachana*, *Ruchya*, *Chakshushya*, *Kapha-Pittaghana* properties. It is used in *Trishna*, *Chhardi*, *Aadhmama*, *Shoola*, *Kasa*, *Shwasa*, *Hikka*, *Kshaya* named diseases It manages the *cough*, *pitta*, blood disorder, thirst, vomiting, pain, hiccups and abdominal distension. 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. Clove for a tooth ache has been used by Indians more than decade. Using of the clove powder or oil to beat toothache and tooth-related troubles are generally been used in all Indian families. The clove powder improves the cholesterol ratio, maintains the pH in the GI tract that in turn avoids all kinds of oral infections. Cloves contain eugenol, a chemical compound widely used as an analgesic and local anesthetic, particularly in dentistry. Clove oil provides the greatest benefit for toothaches. Clove oil has natural analgesic, antiseptic and antibacterial properties. Clove oil is used in preparation of some toothpastes and Clovacaïne solution, which is a local anesthetic used in oral ulceration and inflammation. In this review article, an effort has been made to explore all properties of *lavanga* (*Syzygium aromaticum*) and its mode of action.

## KEYWORDS

Ayurveda, *vata dosha*, toothache, eugenol, clove oil.

## INTRODUCTION

*Syzygium aromaticum* commonly known as Clove. Clove has been extensively used in ayurveda.. It has been used traditionally for the treatment of tooth pain, digestive problems, hiccup, oral ulceration, and inflammation or muscle cramps<sup>1</sup>. Clove is an important medicinal plant due to the wide range of pharmacological effects consolidated from traditional use for centuries and reported in literature . In *Charak* and *Sushrutsamhita* the therapeutic use of *lavang* indicated with *tambulasevana* (betel leaf chewing). It is *kaphachhedak* and *pitta shamak*. That's why it is used in Indian spices. *Lavang* has great antioxidant property. It possess antioxidant, anti-fungal, anti-viral, anti-microbial, anti-diabetic, anti-inflammatory, anesthetic, pain relieving, insect repellent properties. It posses *Deepana*, *Pachana*, *Ruchya*, *Chakshushya*, *Kapha-Pittaghana* properties. It is used in *Trishna*, *Chhardi*, *Aadhmama*, *Shoola*, *Kasa*, *Shwasa*, *Hikka*, *Kshaya* named diseases. As per derivation in terms of ayurveda it causes lysis of accumulated *Kapha*. *Kapha* is considered as a *Dosha* of *Tridosha*. Clove is one of the most ancient spices of the orient. Though there is very less explanation of clove in Veda and Samhitas, in the later Ayurvedic treatises, it is explained in detail. Acharya Dalhana has given a synonym *shreechandana pushpa* for *Lavanga* owing to the shape of the flower.<sup>3</sup> Health benefits from the use of clove has been known from centuries. However, commercial use of clove is for the production of clove oil which has many pharmacological activities like, anti-oxidant, anti-inflammatory, anti-viral etc. Other than medicine, clove is also used in perfume industries, bio-fuelling, insect repellents etc. Hence due to increased demand for clove in the global market, its quality is being compromised. So there is a need to know the properties of good quality of clove in terms of its habitat, collection, cultivation, extraction etc. In the light of above, an attempt is made to compile an up-to-date review article on clove covering its habitat, cultivation, collection, tests for purity, extraction methods etc. *Lavanga* are the aromatic dried flower buds, which are commonly used in biryanis, pickles, salads and garam masala.

## Morphological description

**Etymological Derivation**<sup>4</sup> It causes lysis of accumulated *Kapha*  
<sup>5</sup>Cloves are the aromatic dried buds of a tree (*Eugenia caryophyllata* also sometimes *Syzygium aromaticum*) used as a spice in virtually all

the world's cuisine. The term 'Clove' is derived from the French word 'Clou' and the English word 'Clout', both meaning 'nail'- from the likeness of the flower bud of the Clove tree to a broadheaded nail. Clove (*Syzygium aromaticum*) belongs to the family *Myrtaceae*. A large shrub or medium sized tree with pyramidal or conical crown 9-12 meter high and sometime taller. The trunk of this tree is straight. The tree has large leaves and the flower from small clusters. Leaves lanceolate (oval shape), in pairs. Flower buds borne in small clusters at the ends of branches are greenish purple. Drupe called mother of clove is fleshy dark pink. The clove is harvested when it is 1.5 to 2 cm long and consists of calyx, 4 unopened petals and 4 sepals.<sup>6</sup>

**Habit:** the clove tree is a small, handsome, evergreen tree reading 12-15 meter in height, conical in shape when young, later becoming roughly cylindrical in a mature plant. **Stem:** the trunk is up to 30 cm in diameter, is composed of very hard wood. The bark is grey and rough, and slash on a healthy tree is white to rose-pink in colour. **Leaf:** - these are simple, opposite, coriaceous, extipulate, glabrous and aromatic. The petiole is slender, 2-3 cm long, somewhat swollen and pinkish at the base and the lamina is lanceolate or narrowly elliptic dotted with glands, the new leaves appear in flakes and are bright pink. Later the upper surface becomes glossy and dark green, and the lower surface dull and paler. **Inflorescence:** terminal, shortly pedunculate and branched from the base, from 3 flowers as many as 50 or more The angled peduncles and shorter pedicels, about 5 mm long, constitute the clove stems of commerce. **Flower:** hermaphrodite with fleshy hypanthium which is surrounded by the sepals. **Calyx:** four lobed, 3-4 mm long, easily observed in the spice. **Corolla:** 4, imbricate, tinged red, rounded, about 6mm in diameter. Anthers are pale yellow, ovate, opening longitudinally. The style is very stout, swollen at the base, pale green, gland dotted. The stamens fall soon after the flowers open. The two called, multi ovate inferior ovary is embedded in the top of the hypanthium<sup>7</sup>

## General introduction

*Lavang*, *devkusum*, *shrisangaya*, and *shripasunkam*, is the Sanskrit name of *lavang*. It is pungent and bitter in taste, light in nature, good for eyes, cold in potency, and promote digestive fire, It is digestive in nature and enhance taste. It manages the cough, *pitta*, blood disorder,

thirst, vomiting, pain, hiccup and abdominal distention.<sup>8</sup>

#### Lavang synonyms -

**Sanskrit names**-devkusuma, devapuspa, lavanga, sriprasun, chandanpushpak, vaareej,

**English names** – clove, cloves, caryophyllus, carophyllus

**Botanical names** – Eugenia caryophyllus, Syzygium aromaticum.

**Family** – Myrtaceae

**Hindi** –lavang, laung

**Marathi** –lavang

**Malayalam** –grampu, karayampu

**Kannada** –krambu, daevakusuma, lavanga

**Tamil** –kirampu, kiraambu, grambu

**Bengali** –lavanga

**Gujrati** –lavang

**Oriya** –labanga

**Urdu** –laung

#### Phylotaxy of lavang tree-

**Height** - 30-40 feet in height,

**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

#### Collection-

After 7-8 years of age there is formation of buds.

Developing clove buds are collected before they get full grown.

#### 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.

#### 3.1 Ayurvedic properties-

Guna-snigdha, laghu

Rasa-tikta, katu

Vipak-katu

Veerya- sheet

Karma- dosh karma- due to tiktakatu rasa it is kaphashamak, due to its sheet veerya it is pitta shamak

**Chemical Composition** It Contains 15 to 20 % volatile oil in which 85-92% Eugenol is present 10 to 13% tannin (gallatonic acid), resin, Chromone, Eugenin, Caryophyllene (Similar As Phytosterol). In oil-Eugenol similar like phenol, Acetyl Engeol-10% Methyl Salicylate, Methylamylketone, Vanillin, Caryophyllene, Furfurol Generally oil is colourless or light yellow in colour<sup>9</sup>

Beta caryophyllene - 5-12%

Methylamylketone, Methylsalicylate-responsible for odour of clove Leaf oil Essential oil – 3.0-4.8%

At different stages of leaf growth eugenol content increases from 38.3 to 95.2% Where as Euginyl acetate decreases from 51.2 to 1.5 % and caryophyllene from 6.3 to 0.2%

**Analgesic activity** In dentistry, eugenol in combination with zinc oxide is used for temporary filling of cavities. Clove is an anodyne (an agent that soothes or relieves pain) for dental emergencies. Eugenol has pronounced anaesthetic property so when applied to a cavity in a decayed tooth, it relieves toothache. Rubbing of oil of cloves on sore gums and teeth help to ease pain. Eugenol depresses sensory receptors involved in pain perception by inhibiting prostaglandin biosynthesis. Eugenol also inhibits platelet aggregation and thromboxane synthesis.<sup>10</sup>

**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 euginolacetate were comparable with alpha Tocopherol like natural anti-oxidants<sup>11</sup>.

**Anti-microbial activity**- Clove possesses great antiseptic property. Clove oil is effective against *Styphylococcus* species,

*Aspergillusniger*, *Klebsiella pneumonia*, *Pseudomonas aeruginosa*, *Clostridium perfringens*, *E. Coli* and *Candida albicans*[8]. Eugenol is effective against tuberculosis.

**Anti-viral activity** -Eugenol also shows antiviral activity against herpes virus at a concentration of 10 mcg/ml

**Anti-inflammatory**-Eugenol functions as Anti-inflammatory agent. Clove contains large number of flavonoids such as Beta caryophyllene, Rhamnetin which initiate clove's anti-inflammatory and antioxidant properties

**Antipyretic** –Eugenol, main component of clove oil reduces fever through a central action similar to that of acetaminophen.

**Anti-carcinogenic**- It is found that, aqueous infusion of clove reduces lung carcinogenesis strain in mice. It significantly reduces number of proliferating cells.

**Anti-diabetic**- Clove regulates the expression of some genes in similar manner to that of insulin.

**Anti platelet**- It was found that both eugenol and euginol acetate are potent in inhibiting platelet aggregation.

**Anti-stress**- Clove extract found to be useful in relieving anoxic stress induced convulsions in mice.

**Aphrodisiac**-Ethnolic extract of clove found to be effective in increasing sexual activity of normal male rats.

**Mosquito repellent**- Clove oil is found to be potent mosquito repellent

**Hepato-protective**-Ethnolic extract of clove is found to be hepatoprotective in paracetamol induced liver injury.

**Cytotoxic activity**- Clove oil has cytotoxic property towards human fibroblasts and endothelial cells.

**Fungicidal activity**-It has been seen that eugenol has anti candidal effect in oral candidiasis

**Bactericidal activity**-Eugenol has bactericidal effect against both positive and negative bacteria like streptococcus pyogenes, proteus vulgaris, Escherichia coli by disrupting their outer membrane

**Tooth ache**-Eugenol has analgesic effect in dental caries. Clove oil cotton plugs is been used in dental carries traditionally

**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.

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

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

**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.

Clove oil contains eugenol has been used extensively in dentistry for its anesthetic and antianaerobic bacteria activity. The short duration of effect has been used in anesthesia. In vitro studies demonstrate activity of clove oil against gram positive and negative pathogenic to humans including multi resistant. When use clove oil for tooth pain it's the eugenols that provide relief. Eugenol is a natural anesthetic and antibacterial, and it works well at reducing inflammation in the mouth. Infect a study by British association of oral and maxillofacial surgeons showed that eugenol is much more effective than using another analgesic and doing nothing else. Eugenol is used as a component of several dental materials [e.g. dental cement, impression pastes and

surgical pastes. Such product is principally combination of zinc oxide and euginol in varying ratios.

#### Therapeutic uses by *Samhitas*<sup>12</sup> –

1. *Shirshooljanyapratishyay*(sinusitis induced headache)- Local application of lepa on forehead
2. *Mukharoga,kantharoga* (oro dental 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. *Dhvabhang* (Erectile Dysfunction) – Oil application on penis for aphrodisiac action
6. *Aamplapitta*(Hyperacidity) – *Aampachan* , *Agni deepan*(appetizer) *Pitta vidah shanti* (Reducing Burning Sensation), *Shoshan of dravapitta*.
7. *Kaas, shwas, hikka*(respiratory disorder)
8. *Jwara*(Fever) –*LavangodakinJwara*. *Aruchi*(Anorexia), *Agni mandya* (Loss of appetite), *Ajeerna* (Dyspepsia), *Chhardi*(Vomiting), *Trushna*(Excessive thirst), *yakrutvikara* (liver disorder)
9. *Firang, upadansha*(soft chancre) –*raktadushtinaash*(purification of vitiated rakta)
10. *Lavangambu* – In *visuchika, pipasa*(cholera induced trushna)
11. *Koshnajalapishtvalepa*(local application of paste)- In *vaatvikara* (Neurological Disorder for pain relief).

**Part Used**<sup>13</sup>- Flower buds and oil **Posology** *Kwath*- 50-100ml *Churna*-500 mg to 1gm. Oil-3 To 6 Drops **Specific Formulations** *Lavangadi churna, Lavangchatussama, Lavangadi vati, Avipattikara churna, Suparipaka*.

**Adulteration** Clove is adulterated with exhausted cloves, blown cloves, clove stalks, mother cloves. Extract of leaves containing 3, 4-dihydroxyphenethyl alcohol and 3, 4, dihydroxybenzoic acid exhibited anti inflammatory activity.

#### DISCUSSION-

This article basically focus on *samhitagranthas* reference of *lavanga* and 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 it also 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

*lavangais* a plant of miraculous nature. It has wide range of medicinal properties which can be used for welfare of human being without any side effects. It has traditional use and well documented to use in modern medicine too. This article basically focus on *Bhavprakash Nighantu* reference of *lavanga* and its therapeutic uses describe in *nighantu granthas*. 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 it also has *aampachaka, krumighna, sheer shool nashak, kapha chedana* 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. It possess euginol like chemical constituents with many flavonoids which are having large effects on physiology of normal human being. Its *iktakatu 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 oro dental disorder. And due to its aromatic flavonoids it act as *mukhavaishadyakar*. Euginol and euginol acetate has great fibroclastic activity on mucosal membrane. Clove is usefull as anti carcinogenic 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 *lavanga* has great pharmaceutical applications. And it requires further clinical evaluation of the same

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