

EVALUATION OF ANALGESIC ACTIVITY OF SYZYGIUM AROMATICUM W.S.R. TO PAINFUL TOOTH

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ABSTRACT

Pain is a symptom of mental and physical hurt or disease. In ayurveda, it is known as *shoola roga*. Pain can be of any region, but it is caused due to the aggravation of the *vata dosha*. From the ayurvedic perspective, this herb has the great medicinal importance for the treatment of various elements. It manages the *cough*, *pitta*, blood disorder, thirst, vomiting, pain, hiccups and abdominal distension. 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 Clovacaine solution, which is a local anesthetic used in oral ulceration and inflammation. In this review article, an effort has been made to explore the analgesic 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. This is a spice or condiment that has been used in the kitchen for centuries. It has been used traditionally for the treatment of tooth pain, digestive problems, hiccup, oral ulceration, and inflammation or muscle cramps.^[1] It acts as a stimulant and is very use full in the relieving problems of spasmodic disorder. It relives flatulence and stimulant the sluggishness of blood circulation promoting digestion. It contains eugenol which has healing properties and soothes the nerves that reside inside the tooth. Clove is used in Indian medicine, Chinese medicine and dentistry where the essential oil is used as an anodyne (pain killer) for dental emergencies. Clove is an important medicinal plant due to the wide range of pharmacological effects consolidated from traditional use for centuries and reported in literature.^[2]

Morphological description [habit]

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 likeliness 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.^[3]

Introduction of painful tooth

A toothache is a pain in or around a tooth that may be caused by tooth decay, abscessed tooth, tooth fracture, a damaged filling and repetitive motion, such as chewing gum or grinding teeth. Tooth pain may be sharp throbbing or constant. It can also sometime be difficult to decide whether the pain is in your upper or lower teeth. When lower molar teeth affected the pain can often feel like it's coming from the ear. Toothache is the most common type of the orofacial pain and when sever it is considered a dental emergency. A tooth is composed of an outer shell of calcified hard tissue (from hardest to softest; enamel, dentin and cementum) and inner soft tissue core (the pulp system). The teeth and gum exhibit normal sensation are

generally sharp, lasting as long as stimulus. There is a continuous spectrum from physiologic sensation to pain in disease. Pain is an unpleasant sensation caused by intense or damaging events, in a toothache nerve are stimulated by either exogenous source (for instance bacterial toxins, metabolic, chemicals or trauma). The pain pathway is mostly transmitted via myelinated and unmyelinated C nerve fiber of the trigeminal nerve. This supplies sensation to the teeth and gums via many divisions and branches.^[4]

Ayurvedic review of painful tooth

In Ayurveda dental disorder has been mentioned in *Sushruta Samhita*. Generally due to improper cleaning of mouth or remaining food particle in mouth after lunch or dinner, intake of improper mercury formulation create dental disease. In *sushruta samhita* various dental disorders are mentioned as *Dalana*, *Krimidanta*, *Dant harsha*, *Bhanjanak*, *Shankara*, *Kapalika*, *Shyavdant* and *Hanumoksha*. *Dalana* is a disease in which tooth is burst in too many pieces and acute pain is there. Due to deviation of *vata dosha* tooth first becomes black, pores are originated, and then become movable and there is some secretion from that tooth. Acute pain is present due to some reason or without any reason. This condition is called as *Krimidanta*. It creates severe pain in tooth. In *Astanga Sangraha dalana rog* [toothache, odontodynia] is named as *Sheet Danta*.^[5]

Ayurvedic management of painful tooth

By using *Chaturvidha Sneha* (*Ghrita*, *Taila*, *Vasa*, *Majja*) or *Traivrita ghrita* and using of *Vataghana dravya* or using lukewarm gargle terminates *danta hassha* and *dant shool*. *Dant shool* can be treated by using *Snehik Dhoom*, *Nasya*, *Mansrasiddha yavagu*, *Shirobasti* and *vata shamak* processes. Movable tooth should be deracinated and the void space and absorbable cavity should be cauterized than *nasya* made, of *vidarigandha*, *madhuyashti singhada* and *kasheruka siddha taila* should be given to patient.^[6] In *dant shool* cotton swab of this drug is kept in the absorbable cavity. *Lauanga* (*syzygium aromaticum*) is a local analgesic, *vranropak* (wound healing) and *vrana shodhana* (wound refiner). When it is kept in mouth and a person chews this, then it strengthens our gums. Due to *snigdha* property, it is *vatanulomak* and *shool prashaman* drugs.

General introduction of Clove

लवंगं देवकुसुमं श्रीसंज्ञं श्रीप्रसूनकम् । लवंगं कटुकं तिक्तं लघु नेत्र हितं हिमम् ॥५८ ॥
दीपनं पाचनं रुच्यं कफपित्तास्रनासकृत् । तृष्णां छर्दि तथाऽऽध्मानं शूलमाशु विनाशयेत् ।

कासं श्वासश्च हिक्का च क्षयं क्षपयति ध्रुवम् ॥५९ ॥

Lavang, *devkusum*, *shrisangaya*, and *shriprasunkam*, 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.^[7]

Properties of lavang according to ayurved^[8]

<i>Ras</i> -	<i>Tikta, Katu</i>
<i>Guna</i> -	<i>Laghu, Snighda</i>
<i>Virya</i> -	<i>Sheeta</i>
<i>Vipaka</i> -	<i>Katu</i>
Physical properties -	Light, Oily
Potency	Cold
Metabolic properties (after digestion) -	Pungent

Chemical Composition of Clove

Eugenol compose 72-90% of the essential oil extract from cloves and is the compound most responsible for clove aroma, other important essential oil constituents clove oil include acetylene eugenol, beta cryophyllene and vanillin, crategolic acid, galatonic acid, methyl salicylate pain killer).^[9,10]

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.^[11]

Clove oil contain eugenol has been use extensively in dentistry for its anesthetic and antianaerobic bacteria activity.^[12] 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.^[13] When use clove oil for tooth pain it's the eugenols that provide relief. Eugenol is a natural anesthetic and antibacterial, and it work 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 eugenol in varying ratios.^[14]

IN DENTISTRY

Chewing of cloves diminishes bad breadth. The microorganisms which cause bad breath are chosen from the group consisting of: Eubacterium, Fusobacterium, Haemophilus, Neisseria, Porphyromonas, Prevotella, Treponema and Veillonella species. Eugenol acetate present in clove oil is used for inhibiting the growth of microorganisms which cause bad breath and combat bad breath. Eugenol acetate is 4-allyl-2-methoxyphenyl acetate. The clove oils with the highest content of eugenol acetate are the oils which are obtained from the flower buds and which typically contain 75- 90 wt% eugenol, 4-15 wt% eugenol acetate and 5-12 wt% betacaryophyllene.^[15]

Clove helps to decrease infection due to their antiseptic properties. Eugenol is the most important compound of dianthus Essential oil with strong antibacterial and anesthetic properties. Eugenol shows strong destructive effect on viruses, bacteria, saccharomycetes, moulds and protozoans. A very important characteristic of Eugenol is due to presence of essential oil in it is its activity against microorganisms resistant to synthetic antibiotics. Microorganisms are unable to become resistant to essential oils. The Essential oil also shows significant inhibitory effect against hydroxyl radicals and acts as an iron chelator.^[16]

Eugenol is added to root canal sealers (Endomethasone, Caryosan), to temporary fillings and to pastes used for direct pulp capping (Caryosan, zinc oxide). It is used in the disinfection of the tooth canals in the treatment of pulp necrosis or as a precipitator while impregnating the dentin with silver nitrate.^[17]

Other Medicinal uses of Clove

- Clove is used as an anti-inflammatory agent, due to its high content of flavonoids.
- Clove is used as a carminative, to increase hydrochloric acid in the stomach and to improve peristalsis. Apply the paste of clove powder in honey to treat acne. Paste of clove powder in water promotes faster healing of cuts and bites. Eugenol helps in minimizing the harmful effects of environmental wastes that can cause cancer of digestive system.
- Cloves can effectively cure many digestive problems. It is having medicinal qualities to cure flatulence, loose motions, indigestion and nausea. Cloves are useful in relieving the symptoms of diarrhea, gastric irritability and vomiting.

- Clove and clove oil boost the immune system by purifying the blood and help to fight against various diseases. Eugenol is powerful enough for preventing blood clots.
- Cloves are good expectorants that promote the discharge of mucous and secretions in the respiratory passage. The aromatic clove oil, when inhaled can help soothe certain respiratory conditions like cold, cough, asthma, bronchitis, and sinusitis. It also helps in clearing the nasal tract. Cloves can effectively prevent the lung cancer as well as the skin cancer.
- Clove oil stimulates blood flow and circulation making it useful for the people having cold extremities. Cloves benefit the diabetic patients by controlling the blood glucose levels.

How to use clove oil

- Clove oil contains Eugenol which has healing properties and soothes the nerves that reside inside the tooth.
- Chew a few pieces of clove from the area of the offending tooth allow the oil to penetrate into the affected area.
- Alternately mix clove oil with few drops olive oil and apply on the effected tooth with a cotton swab.
- Rinse mouth with warm salt water to clear out bacteria and germs and any residual oil from the mouth.
- We can also use a whole clove don't have any clove oil handy. Place the oil on the affected area and leave it there until the pain comes down. If the effected clove oil is too strong, use olive oil to dilute it.^[18]

CONCLUSION

lavanga is 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.

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