



## MEDICINAL USES OF LAVENDER OIL (*LAVANDULA LATIFOLIA*) AND ITS EFFECT ON HUMAN HEALTH

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### Abstract

Lavender plant is perennial flowering aromatic herb that belongs to *Lavandula* genus native to Northern Africa and the upper hilly regions of Mediterranean for its flowers and extraction of oils. In India, it is cultivated in low rainfall regions and on slopes of Himachal Pradesh and Uttar Pradesh. However, it is successfully grown in Kashmir Valley region. Lavender oil mainly contains 40% linalyl acetate and 30% linalol. One is terpene alcohol and later one is the acetate ester of linalool and both having anti-microbial activities and provide a remarkable value to the lavender. Other constituents of the oil are cineol, pinene, limonene, geraniol, borneol and some tannin. In addition to cosmetic values, lavender has been found successfully a relief from anxiety, insomnia, depression, menstrual pain, headache, healing of wounds, muscle relaxation and pain after surgery. Recent studies by the researchers suggest that the lavender oil is effective in treatment of hair fall, acne and eczema for good skin health and consuming lavender as a tea has shown aromatherapy over can help digestive issues such as vomiting, nausea, intestinal gas, upset stomach, and abdominal swelling.

**Keywords:** Lavender, *Lavandula*, linalol, linalyl acetate, limonene, acne, eczema.

### Introduction

The word 'lavender' is composed from the Latin word 'lavare' means 'to wash' and species name 'latifolia' is also Latin that means 'broadleaf'. Genus *lavandula* consists of 47 different known species of flowering plants and belongs to the family Lamiaceae due to its pale bilabiated blossoms, aromatic oils, broad leaves and square stem. It is originated from Cape Verde and the Canary Islands, Europe across to northern and eastern Africa, the Mediterranean, southwest Asia to southeast India. Most of the species are grown at low temperature climates for ornamental value for gardening and covering land, or as aromatic herbs, and essentially for the oil. Essential oil is very popular due to its use in complementary medicine and cosmetic products preparation. Besides this, some products are being in use from several decades as a remedial agent with recent advances, the important oils obtained from such plants, being widely in use because of the anti-microbial property from the time of First World War. In general, True lavender (*Lavandula angustifolia*), Spike lavender (*Lavandula latifolia*) and Lavandin (*Lavandula x intermedia*), a sterile hybrid (*L. angustifolia* × *L. latifolia*) have been in cultivation.

### Chemical constituents of lavender oil

Lavender oil is commonly extracted by steam distillation and has found to be soluble in alcohol in all proportions and mainly contains upto 40% linalyl acetate and 30% linalol as well as cineole, pinene, limonene, geraniol, borneol, etc. but spike lavender have more camphor content in comparison to other species of *lavandula* genus.

### Linalol

It is a terpene alcohol having anti-microbial activity. Linalyl acetate- is chemically derived in the ester form of acetate from linalol and has a lovely, sweet, and fruity smell which alongside its anti-microbial activities provides lavender a remarkable value. Another aroma containing compound present in lavender oil is linalyl butyrate. Ester or aromatic value of lavender oil is affected by various cultural practices which includes varietal selection, soil type, harvesting of flower, distillation method and procedure. The

oil of spike lavender (*L. latifolia*) contains  $\alpha$ -pinene, camphene,  $\beta$ -pinene, sabinene, 1,8-cineole,  $\beta$ -cymene, camphor and linalool. All lavenders including *L. angustifolia*, *L. x intermedia*, *L. latifolia* and *L. stoeches* contain the antioxidant rosmarinic acid (McCoy, 1999).

Constituent	Lavender	Spike lavender
Linalool	31%	35%
Linalyl acetate	38%	Trace
1,8-Cineole	0.8%	31.5%
Camphor	0.2%	17%

### Synthesis cycle of Monoterpenes

**Spike lavender** (*Lavandula latifolia* Medicus) is one of the important ornamental herbs with increasing economic value because of its distillation extracts which are primarily consists of monoterpenes. The primary elements of the extraction from blooming parts are Linalool, Cineole and Camphor, whereas the leafy parts are source of Cineole and Camphor. Geranyl diphosphate molecule (GPP) is main source of all monoterpenes.

**Camphor synthesis:** Conversion of GPP to bornyl pyrophosphate by cyclization of linaloyl pyrophosphate which is now converts to borneol by hydrolysis reaction and on oxidation produces camphor (Poudereux *et al.*, 2017).

**Cineole synthesis:** Initially  $\alpha$ -terpineolis produced from GPP with action of  $\alpha$ -terpineol synthase and the primary precursor will produce cineole by the action of cineole synthase.

### How to Grow Lavender

Lavender requires hot, dry and sunny climate. To grow lavender, cuttings and seedlings are preferred as it is tough to raise it with seeds that need cold stratification for several weeks before planting. Normally, rooted plant cuttings are raised in small pots of 3-4 inches. Once roots become developed strong, plant these in field or garden with spacing of 2-3 feet between plants and 3-6 feet between the rows. Lavender grows well in loose, alkaline soil with good drainage. Avoid organic mulching as it increases fungal infections and weeds. Mulching with gravels and white sand gives better results. Water lavender once or two times a week

until plants mature and reduce watering to every two or three weeks until harvesting. To protect from over wintering in difficult winters, care plants with fabric row covers and wind

blockers. Harvest by cutting flower spikes just at blossoms with scissors in the morning time. Make bundles of 50-100 stems to dry in a cool, dark place.

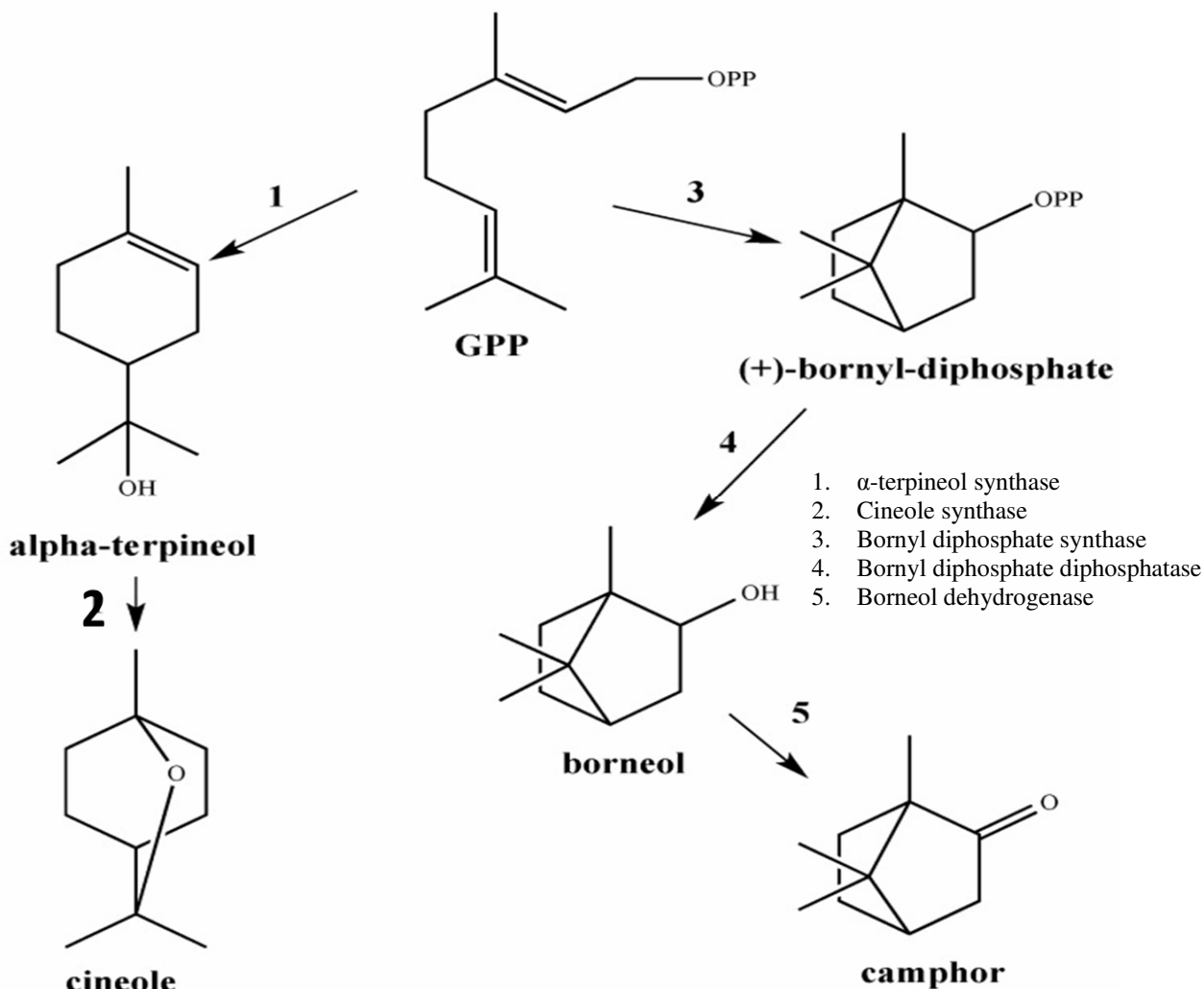


Fig. 1 : Basis of cyclisation and formation of prime Monoterpenes: Camphor and Cineole, Borneol.

#### Lavender oil: Uses and facts

Lavender oil has strong analgesic, carminative, sedative, anti-inflammatory and anti-depressive property; in addition to this it also has antimicrobial effects. Lavandula oil has been observed to be dynamic against numerous types of microscopic organisms, including those impervious to anti-microbial, for example, methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant *Enterococcus* (VRE) (Cavanagh and Wilkinson, 2002). The capacity of oil to disturb the porousness membranous structure of cell, in this way interfering with the chemosmotic control is the most conceivable explanation behind its deadly activity against bacteria (Miladinovic *et al.*, 2012). Due to lavender oil's antifungal property it has medicinal and also plant health benefits by inhibiting the growth of germ tube or control diseases (Cavanagh and Wilkinson, 2005). Recently it has been stated that most of the essential oils are tested for anti-fungal responses and oils derived from true lavender and *Lavandin* demonstrates the greater impact on growth of *Aspergillus nidulans* and *Trichophyton mentagrophytes*.

#### Other medicinal effects of lavender oil:

- 1. Fungal infections** - It has been observed in recent studies that the lavender oil is effective against anti-fungal resistant infections and is lethal to various strains causing skin diseases. The study concludes that the oil seems to inhibit fungal growth by acting on cell membranes of fungus.
- 2. Wound healing** - Lavender oil is also effective for healing the cuts and wounds. A comparison between the impacts of TENS (Trans-cutaneous Electrical Nerve Stimulation), brine solution, iodopovidone or PVP-1, lavender oil by applying on rats have done in the laboratory. The results show TENS and lavender oil gives more relief by healing wounds early (Kutlu *et al.*, 2013).
- 3. Loss of hair (*Alopecia areata*)** - Various treatments on hair fall problems show that combination of various plant oils including lavender, rosemary, cedar wood, thyme enhances the growth of hair by 44%.
- 4. Anxiety** - Lavender oil is traditionally in use for reducing tension and nervousness. In this fact, *Silexan-*

80 mg gelatinised capsules has been found effective against disorders related to anxiety (Kasper, 2013).

5. **Canker sores** –Applying few drops of oil 3 times on daily basis is effective to reduce sore swellings and pain by healing the canker sores at faster rate.
6. **Post-menstrual problems**–Inhalation of lavender fragrance in primary days of menstruation reduces the pain in stomach and backache. Aromatherapy massage with lavender oil in comparison with common massage is found to be more effective in post- menstrual related problems.
7. **Fall counteractive action**–There is a reduction of fall simply putting lavender oil on the pad at the neck line area of cloth.
8. **Post-surgical pains**–Few explorations demonstrate the fact that inhalation of essence of lavender along with accepting agony executioners intravenously gives a cut break in the pain after C section surgery in women (Wilson, 2018). One more research shows the effective response of lavender fragrance over the use of acetaminophan in pain relief after removal of tonsils in children of age 6-12 years old (Soltani *et al.*, 2013).

#### Possibly Ineffective for

- **Cancer-related pain** -Aromatherapy massage with lavender oil does not reduce pain in individuals suffering pain in relation with cancer.

#### Related Inadequate Evidences -

- **Itching and aroused derma (Dermatitis)** –Some of the early analysis shows the irresponsive nature of aromatherapy with the lavender oil over the dermatitis and restless sleep due to itching and aroused skin.
- **Infant crying due to colic** –A little examination demonstrates rubbing lavender in a blend with almond oil on the tummy of newborn babies for 10-20 minutes at beginning of colic reduces the time lapse of crying by seven hours of every week.
- **Dementia** –Utilizing lavender oil in diffuser around evening hours diminishes the disturbance related to dementia in many people but some researches show that the therapy appears to have no effect on mental capacity and no control on agitation.
- **Dejection**–Orally inhaling of lavender seems to be somewhat less viable than the normal medication. However, combining both enhances the anti-depressant response of the medicine and seems to be effective in reducing depression in women after labor.
- **High circulatory strain**- Utilizing a fundamental oil blend of lavender, lemon as fragrance based healing may lessen the systolic pulse but not the diastolic pulse in individuals with hypertension.
- **Restless sleep**-More commonly known as Insomnia can be cured by sleeping under presence of lavender essence in vapour state that can be achieved from oil with use of vaporiser.
- **Repellent to parasites**–Application of the mixture of oils obtained from tree of tea and lavender on skin prevents from lice attachment to body and also is lethal

to lice eggs. However, it is not yet clear about the anti-repellent property of lavender oil.

- **Menopause**–Inhaling fragrance of lavender two times a week for nearly three months may effectively decrease the number of flushes during menopause in women.
- **Headache**- Putting few oil drops on upper lip may reduce the chances of pain due to migraine and nausea.
- **Bone weakness**- Rubbing the oil on knee as per guidance might give relief from joint pain and reduce the chances of Osteoarthritis.
- **Eardrum diseases**–Putting the lavender oil as drops in ear reduce the infections in the ear and gives relief from the pain.
- **Agony**–Researches show the adequacy of lavender oil in lessening agony associated discomfort during inserting of needle and gynaecological tests.
- **Post labor issues**–Taking showers with lavender appear to lessen the red blood rashes within the space between vaginal part and anal part due to constrictions during labor. Since the therapy may likewise lessen the pain around the pubic regions yet the consequences are clashing. Breathing in the fragrance of lavender three times a day may also help in relieving from tiredness, nervousness or change the perspectives in the mind of ladies on primary day after labor.
- **Diminishing tension before surgical procedures**– Few individuals utilize lavender for decreasing nervousness before surgical or dental treatments. Some exploration demonstrates that it may help diminish uneasiness before dental treatments. However, it's not clear whether lavender aids for tension and stress associated issues.
- **General mental prosperity**- Various analysis demonstrate that mixing 2-4ml of oil blend containing 1 part of lavender and 4 part of grape seed oil in day by day showers delivers little upgrades in state of mind in contrast with showers having grape seed oil only. However, another analysis results in the fact that using lavender oil in aromatherapy massage will not be going to enhance the prosperity or personal satisfaction in people suffering from cancer.
- **Restless Limbs Syndrome (RLS)** –An investigation gives an exposure to the cure for the RL syndrome just by rubbing the lower limbs for only ten minutes with oil extracted from lavender in individuals experiencing dialysis after renal failure. This will be more effective if applied for two times on weekly basis treatment.
- **Stress** –Breathing in the fragrance of lavender oil preceding the gynaecological test appears to downsize the trouble following the test. However, it may not likewise reduce stress on the succeeding days after coronary artery bypass surgery.

#### Side Effects on human health& Safety on use:

Lavender is probably going to be anchored numerous grown-ups in sustenance sums and is likely secure to use while taking it orally, or applying to the derma, or breathed in healthfuldoses. At the other point when taken orally,

lavender may tends to increase the stomach problems, continuous pain in the head, and exaggerated appetency. While applying on the derma lavender generally causes itching that is not in common.

#### Particular safety measures and harmful effects:

- **For Children:** Application of the lavender items on the skin is conceivably insecure for sexually immature boys as it appears to show negative impacts on hormonal secretions which results in typical hormonal disturbance and unusual growth of breast in males.
- **For pregnant women:** No study on the effect of lavender in pregnant and breast feeding women. So, it's better not to prefer use of lavender.
- **Medical impacts:** Slowing down of sensory and nervous pathways when medicated along with anaesthesia is found in some medical procedures.

#### Chemical associations:

The National Institutes of Health (NIH) put forward some norms and guidelines to aware public about the combination of lavender with various drugs mentioned below:

- With Benzos and Barbiturates results in deep sleep,
- With Capoten, Vasotec and Cozaar cause reduction in blood pressure.

However, researchers are going to work on the segregating segments of lavender extract which are yet to be recognized and expecting of synergistic impacts of segments with biological factors (Wilson, 2018).

#### Conclusion

Lavender is typically believed to have mythical importance and considered as secure oil at very early days however it has been found lethal to human health in some consequences. Since conflicts are everywhere and further researches are need to be carried out to discover many more aspects on the aroma based impacts and resulting association of lavender oil with prescribed medical treatments. The Food and Drug Administration (FDA) has not yet accepted the medical allowance of lavender and mentioned to prefer the prescribed medical treatment rather than using lavender as a supplement in many cases. Observation from various researches also suggest that lavender has shown its anti-biotic

nature by acting on various microbial contaminations and on other hand it is being added in food supplements due its brilliant odour and aroma. Hence, lavender continues to be in general use by public and clinic staff.

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