

**Welcome to...**

Penny Price Academy  
of Aromatherapy

**Saturday Club**

Chemical Component Focus



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Nov 2023

# Why focus on single components?

- Understand how and why an EO does what it does (mechanism of action)
- Predict the properties of an untested EO - This means generalising the effects of single constituents to whole essential oils, which always has an element of uncertainty.
- Sometimes oils don't always fit their chemical "family" so understanding a single component can help us find where they fit.





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# Applying it to Aromatherapy

- Recent research in Europe has found a link between the alpha and beta pinene content in the coniferae oils being directly active on the male hormonal system.
- If the two chemicals are held in equal quantities, the oil will be able to help with low libido and testosterone levels, keeping the male healthy and balanced. A good example would be Pine oil.







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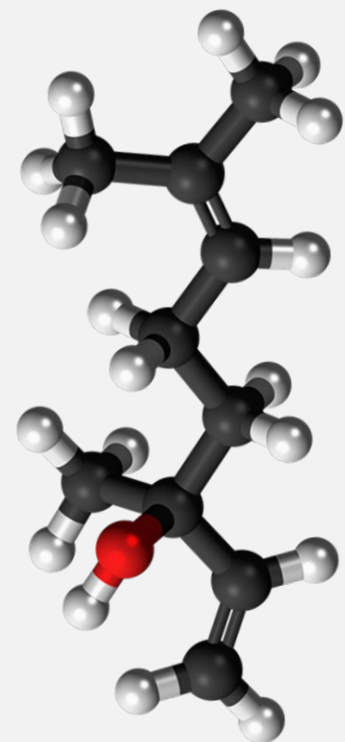
# Linalol or Linalool

However you read this it means the same constituent but there is an English and also an American spelling.

There are many ways linalool can be depicted so check that it is C<sub>10</sub>H<sub>18</sub>O.

Ho Leaf (*Cinnamomum camphora*) is 90% Linalool and is proven to be sedative also Coriander is 72% Linalool and is proven to be anxiolytic & sedative.

A comprehensive review on the effects of linalool (Aprotosoaie et al 2014) shows that the different isomers of this constituent effect 10 different pathways including anti inflammatory ones.





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# Linalol or Linalool Properties

**Pain-killing** - Anti-nociceptive. Ten different pathways affected, including anti inflammatory ones (in vitro, and in animal models).

**Anxiolytic** - Human studies suggest that inhaled R-linalool and mixed isomer linalool are anxiolytic, but not S-linalool. In rodents, S-linalool causes apparent anxiolytic effects whether inhaled or administered orally.

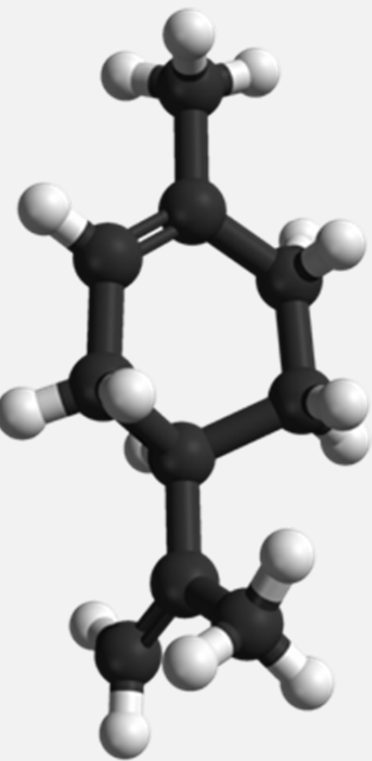
**Sedative** - Calming properties from linalool inhalation seen in both mouse and human studies. Mechanism likely to be modulation of neurotransmitters in the brain.





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# Limonene

Has a molecular mass of 136.238, it can penetrate the skin very quickly and helps drugs like haloperidol (antipsychotic drug used for schizophrenia) pass through the epidermis.

Doses of d-limonene in rats were found to protect against stomach ulcers caused experimentally (Moraes et al 2009). Giving evidence to the traditional method of citrus oils for digestive issues.

Both sweet and bitter orange are 95% limonene while grapefruit is 94%.





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# Limonene Properties

**Fat metabolism** – In a mouse study, HDL cholesterol was promoted over LDL cholesterol production and there was an overall reduction in fat accumulation (Jing et al 2013).

**Gastro protective** – as in previous slide doses of 245 mg/kg of d-limonene in rats were found to protect against stomach ulcers caused experimentally (Moraes et al 2009)

**Tumour Preventive** -The potential interference of limonene with breast cancer cell growth in rodents prompted a trial in women with early stage breast cancer. It was found that some of the markers of tumor growth were reduced, suggesting a preventive effect (Miller et al 2013)







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# 1, 8 Cineole (Eucalyptol)

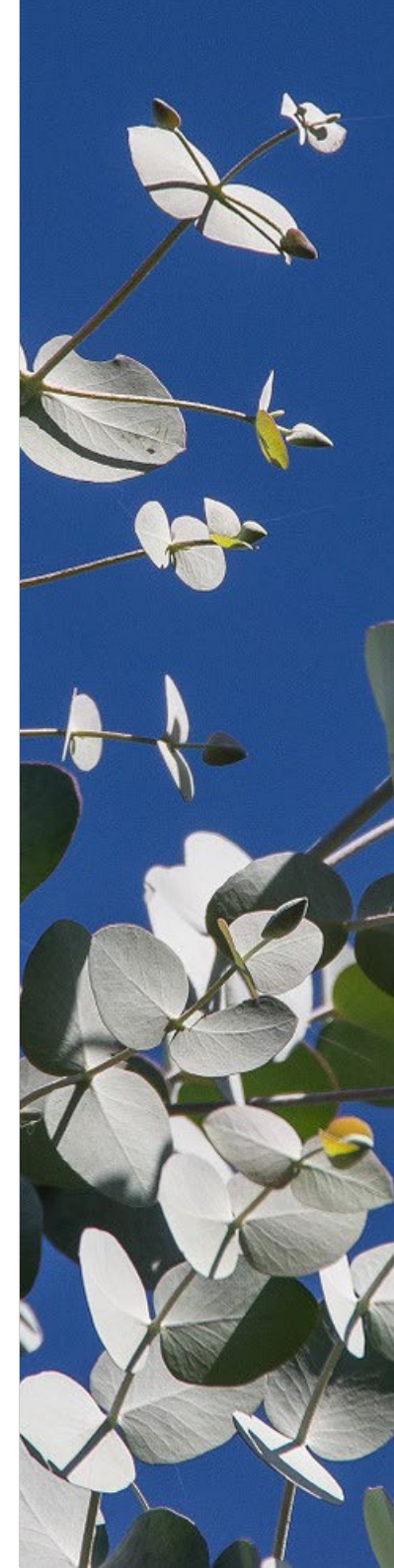
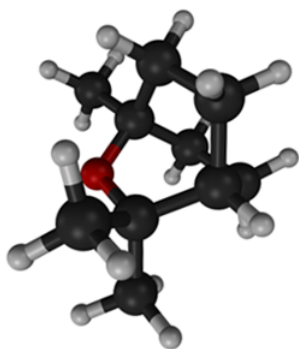
Formula:  $C_{10}H_{18}O$

Molecular mass: 154.249 g

Absence of  $C=C$  bonds makes it resistant to oxidation. Penetrates epidermis easily.

*Eucalyptus globulus* is 80% 1,8 Cineole and research has proven it to be anti-inflammatory and analgesic

*Rosmarinus officinalis* ct cineole is 47% and research has proven it to be anti-inflammatory and analgesic.







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# 1, 8 Cineole (Eucalyptol) Properties

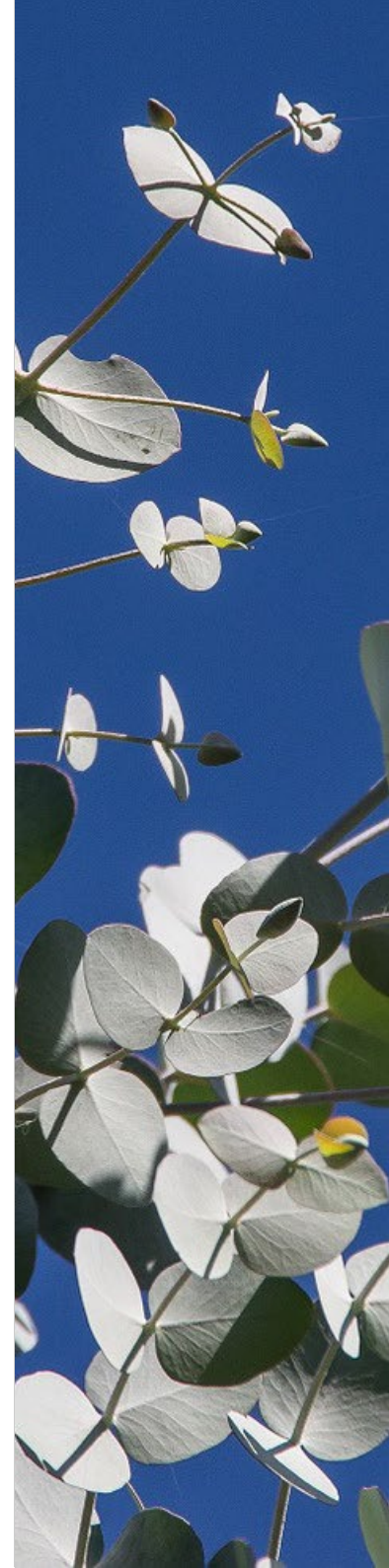
Many studies have shown that 1,8 Cineole is good for the respiratory system.

It is anti-inflammatory to the airways - Oral doses alleviated symptoms in COPD and asthma human trials.

**Anti-inflammatory** - Oral doses alleviated symptoms in COPD and asthma human trials.

**Analgesic** - 1,8-Cineole is an antagonist of TRPA1 (pain receptor). Rodent studies show synergy with morphine, though 1,8-cineole is not an opioid.

**Acetylcholinesterase inhibitor** - Potentially useful in helping increase alertness in people with reduced acetylcholine (e.g. people with early-stage Alzheimer's disease)





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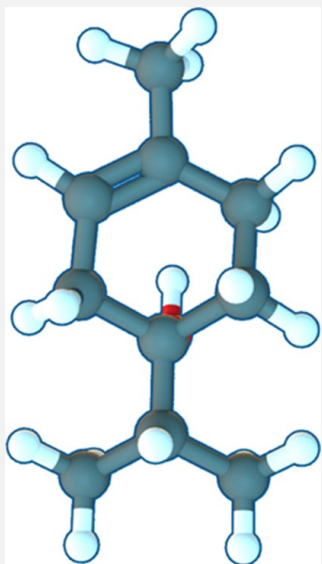
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# Terpinen-4-ol

Terpinen-4-ol is an isomer of terpineol with the chemical formula  $C_{10}H_{18}O$ . A primary constituent of tea tree oil.

Oxidizes at the site of the carbon double-bond ( $C=C$ ) in presence of oxygen and its oxidation products can be allergenic. It penetrates human epidermis moderately well.

Found in tea tree at 43%, plai at 41% and sweet marjoram and 21%.





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# Terpinen-4-ol Properties

**Antibacterial** - Gram-negative and Gram-positive bacteria are generally susceptible.

**Antifungal** - In vitro studies show effect against oral and vaginal *Candida albicans* (thrush), including strains resistant to antifungal medication.

**Anti-inflammatory** - In vitro studies show inhibition of inflammatory pathways. Terpinen-4-ol inhibited skin weals (wheals) caused by histamine in a human trial.







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# Linalyl Acetate

Linalyl acetate is a naturally occurring phytochemical found in many flowers and spice plants.

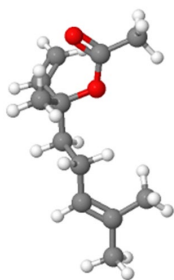
It is one of the principal components of the essential oils of bergamot and lavender.

Chemically, it is the acetate ester of linalool, and the two often occur in essential oils together.

Lavender true (*Lavandula angustifolia*) has 40-45% of linalyl acetate

Bergamot (*Citrus Bergamia*) has 17%

Clary sage (*Salvia sclarea*) has 58%



ChemEssen.com





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# Linalyl Acetate Properties

**Anti-inflammatory** - The results suggesting that linalool and linalyl acetate-producing species are potentially anti-inflammatory agents.

**Analgesic** - Significant differences in pain magnitude and urinary residual sense of indwelling catheters were observed among the three groups, with inhalation of linalyl acetate being significantly more effective than inhalation of lavender or vehicle. Inhalation of linalyl acetate is an effective nursing intervention to relieve pain and urinary residual sense of indwelling urinary catheters following their removal from patients who underwent CRC surgery (So Hyun Yu 2017)

**Anxiolytic** - The studies on the benefits of lavender's aroma have shown that linalool and linalyl acetate present in this plant can stimulate parasympathetic system.





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# Conclusion

EXCLUSIVE 10% OFF ALL PRODUCTS BELOW!

Bitter Orange

E. Globulus

Ho Leaf

Tea Tree

Marjoram Sweet

Lavender

Coriander

Sweet Orange

Grapefruit

Rosemary Cineole

Plai

Bergamot

Clary Sage

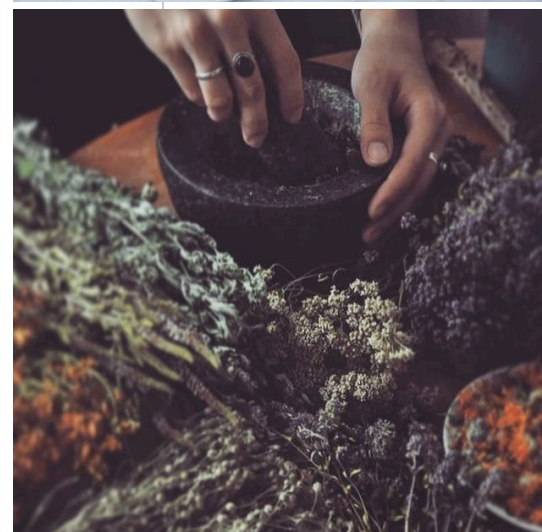
Pine

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