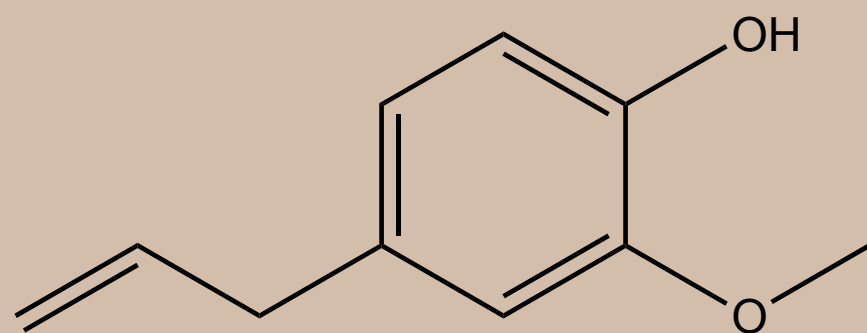


# THE CHEMISTRY OF CLOVES

## WHY DO CLOVES HELP TOOTHACHE?



EUGENOL

The essential oil of cloves is often touted as a remedy for dental pain; it is composed mainly of 70-85% eugenol, 15% eugenyl acetate, and 5-10%  $\beta$ -caryophyllene.

Eugenol has antiseptic and anti-inflammatory properties. As well as this, it has anaesthetic properties, due to its ability to inhibit movement of sodium ions in peripheral nerves. Additionally, it can act as an antifungal and antibacterial agent. However, the FDA believes there is currently not enough evidence of its effectiveness for it to be recommended in treating tooth pain - though some research has shown it may be of use in creams for the treatment of premature ejaculation.

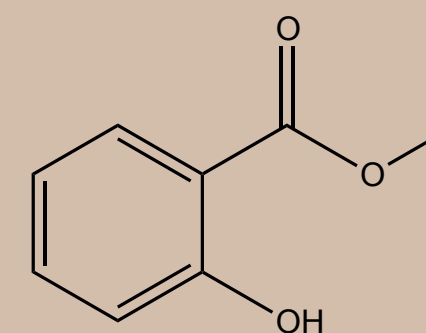
Eugenol can also have toxic side effects in larger quantities - as little as 5-10 ml of undiluted essential oil could cause these. It can damage the liver and respiratory system.



## WHAT GIVES CLOVES THEIR AROMA?



2-HEPTANONE



METHYL SALICYLATE

The aroma of cloves is partly influenced by eugenol, but minor compounds such as 2-heptanone and methyl salicylate are also significant contributors. Interestingly, 2-heptanone is also a compound secreted by honeybees; they secrete it when biting intruders in their hives, and the anaesthetic effect paralyses the intruding creature and allows it to be removed.