

# Cloves

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Cloves are unopened aromatic flower buds, commonly used as a spice and food preservative. Medicinally, they have been most notably used as an anaesthetic and antiseptic for toothache. Antispasmodic, carminative, antioxidant and antimicrobial activities have been reported.

**PREPARATIONS:** Various clove preparations are available, including whole, ground or powdered cloves (available loose or in capsule or gel formulations), and oil of cloves.

**COMMON NAMES:** Cloves, clove, tropical myrtle.

**LATIN NAME:** *Syzygium aromaticum* (synonyms: *Eugenia aromaticum*, *E. caryophyllus*, *E. caryophyllata*).

**ACTIVE CONSTITUENTS:** Eugenol and eugenol acetate are major components of clove. Other components include phenolic acids (gallic, caffeic, ferulic, elagic, salicylic) and flavonoids, such as kaempferol and quercetin.

**MANUFACTURER CLAIMS:** Clove oil has been recommended in dentistry as an antiseptic, anaesthetic and mouth freshener; and as an analgesic and anti-inflammatory in rheumatic pain, neuralgia, headaches, earache, and minor skin irritations. Cloves have also been claimed to enhance digestive health through its carminative and stimulant properties, to improve blood circulation, reduce blood pressure, and boost immunity. Cloves are also reported to have

## Summary Message

Eugenol contained in clove exhibits antimicrobial activity and has been shown to work synergistically with other conventional antimicrobials. There is evidence of clove's analgesic, anaesthetic, anti-inflammatory and antioxidant properties in low concentrations.

High concentrations are toxic and can lead to tissue damage and hepatotoxicity. Avoid inhaling clove smoke, and avoid use in pregnancy and breastfeeding due to lack of safety and toxicity data. Eugenol has been shown to inhibit platelet aggregation and use should be avoided with anticoagulants and antiplatelet agents.

potent antimicrobial and antioxidant properties.

**EVIDENCE FOR EFFICACY:** Eugenol is responsible for the analgesic and anti-inflammatory activity by acting as a capsaicin agonist and directly inhibiting COX-2 enzyme activity, respectively. In low concentrations, eugenol possesses potent antioxidant activity and in animal models has shown hepatoprotective activity against paracetamol-induced toxicity; however, high concentrations are pro-oxidant and can lead to hepatic damage. *In vitro* studies show promising antimicrobial activity, although eugenol works best when used synergistically with other conventional treatments. Clove oil has been shown *in vitro* to inhibit platelet aggregation and cause vasodilation.

**SAFETY/TOXICITY:** Generally regarded as safe when taken by mouth in food amounts. There is insufficient toxicity data to determine safe medicinal doses. High concentrations are toxic and direct application to tissue can result in extensive tissue damage. Inhalation of smoke from cloves may result in breathing difficulty and lung infections. Do not use if pregnant or breastfeeding.

**ADVERSE EFFECTS:** Eugenol is a primary irritant and can cause local skin irritation, allergic contact dermatitis, ulcer formation and tissue necrosis, as well as irritation of the eyes and respiratory tract. High oral concentrations may result in seizures, hepatotoxicity and coma.

**DRUG INTERACTIONS:** Cloves may slow blood clotting and therefore anti-coagulants and antiplatelet drugs are likely to interact, causing bleeding. It is recommended that cloves be stopped two weeks prior to elective surgery.

## Key references

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