



## The Therapeutic Effects of Isolated Eugenol of *Syzygium aromaticum*

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**Received:** 19 September 2019

**Accepted:** 12 October 2019

**ePublished:** 20 November 2019

**Keywords:** Eugenol, Phenolic compound, Herbs, Traditional medicine.

**Citation:** Jabbari N, Gheibi P, Eftekhari Z. The therapeutic effects of isolated Eugenol of *Syzygium aromaticum*. Plant Biotechnol Persa 2019; 1(1): 42-44.

### Core tip

Eugenol (4-allyl-2-methoxy phenol) is a phenolic compound of the clove family *Syzygium aromaticum* (L.) Merr. & L.M.Perry. In traditional and modern medicine, clove oil has been used as an antimicrobial, antiseptic, antispasmodic, antioxidant, anti-inflammatory, anesthetic, anti-carcinogenic, neuroprotective ability, hypolipidemic efficiency, and anti-diabetic effect, induce apoptosis by destruction the mitochondrial membrane and production of reactive oxygen species, household products, fragrance in soaps and cosmetics, skincare products, flavoring substances for food, dental and pharmaceutical products and etc.

**Dear editor**

Eugenol (4-allyl-2-methoxy phenol) is a phenolic compound of the clove family *Syzygium aromaticum* (L.) Merr. & L.M.Perry [1]. In traditional medicine, clove oil has been used as an antimicrobial, antiseptic and antispasmodic. Nowadays, there is also a wide range of use of eugenol for several purposes such as household products, fragrance in soaps and cosmetics, skincare products, flavoring substances for food, dental and pharmaceutical products [1]. Eugenol causes an enhancement in skin penetration of diverse drugs, agricultural applications to protect foods from microorganisms, treatment of skin infections, skin lesions, and inflammatory disorders [2]. The biochemical profile of this compound was confirmed as the antioxidant properties of the antioxidant action and antioxidant activity of eugenol was associated with anti-inflammatory activity [3]. Data from several studies show synergistic effects of eugenol and other antimicrobial compounds that allow the use of eugenol as a proper food additive. According to antimicrobial experiments, Eugenol also is potent to deteriorate the membranes of bacteria which may result in the increase of the penetration of some antibiotics [4]. Additionally, Eugenol can induce apoptosis by destruction the mitochondrial membrane and production of reactive oxygen species [5]. Certain pharmacological properties of the Eugenol have been detected include anesthetic activity, anti-carcinogenic effects, neuroprotective ability, hypolipidemic efficiency, and anti-diabetic effect.

Additionally it is vindicated to be effective against a number of lifestyle-related threats including nervous disorders, digestive complications, reproductive derangements, blood cholesterol irregularity, hypertension, elevated blood glucose level, microbial infections, inflammatory actions, and carcinogenesis [6]. Based on previous studies, due to the administration of Eugenol, activities of various enzymes involved in carbohydrate metabolism increased for instance hexokinase, pyruvate kinase, glucose-6-phosphate dehydrogenase while levels of glucose-6-phosphatase, fructose- 1, 6-bisphosphatase, AST, ALT, ALP, creatine kinase and blood urea were reduced [7]. In conclusion, Eugenol as a therapeutic agent can be incorporated into various foods and herbal medicines for contending considerable metabolic disorders. Additionally, derivatives of eugenol have unlocked a new era in the domain of pharmacology, kindling the research interests on this compound. Nevertheless, more studies are required to specify the dosage level of eugenol for various functional applications and to explore several other hidden potentials of eugenol for the betterment of mankind.

**Authors' contribution**

All authors contributed equally to the manuscript.

**Conflicts of interest**

The authors declared no competing interests.

**Ethical considerations**

Ethical issues (including plagiarism, data fabrication, double publication and etc.) have been completely observed by author.

### Funding/Support

None.

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