



## Plant Biotechnology Persa



## The Therapeutic Effects of Isolated Eugenol of Syzygium aromaticum

# Nazanin Jabbari<sup>1</sup>, Parisa Gheibi<sup>1</sup>, Zohre Eftekhari<sup>2\*</sup>

<sup>1</sup>Department of Biology, Science and Research Branch, Islamic Azad University, Tehran, Iran

<sup>2</sup>Research & Production Complex, Quality Control Department, Pasteur Institute of Iran, Alborz, Iran

### \*Correspondence to

Dr. Zohre Eftekhari z\_eftekhari.vet@alumni.ut.ac.i

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 effets of isolated Eugenol of *Syzygium aromaticun*. 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, anticarcinogenic, neuroprotective ability, hypolipidemic efficiency, and antidiabetic 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 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, anticarcinogenic 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]. previous studies, on Based due to 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, 6bisphosphatase, AST, ALT, ALP, creatine kinase and blood urea were reduced [7]. In conclusion, Eugenol as 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.

### References

- [1] Basch E, Gasparyan A, Giese N, Hashmi S, Miranda M, Sollars D, Seamon E, Tanguay-Colucci S, Ulbricht C, Varghese M, Vora M, Weissner W. Clove (*Eugenia aromatica*) and clove oil (eugenol). J Diet Suppl. 2008; 5:117-146.
- [2] Thompson DC, Constantin-Teodosiu D, Moldéus P. Metabolism and cytotoxicity of eugenol in isolated rat hepatocytes. Chem Biol Interact. 1991; 77:137-147.
- [3] Dawidowicz AL and Olszowy M. Does antioxidant properties of the main component of essential oil reflect its antioxidant properties? The comparison of antioxidant properties of essential oils and their main components. Natural Product Res. 2014; 28 (22): 1952–1963.
- [4] Singh G, Maurya S, DeLampasona MP, Catalan CA. A comparison of chemical, antioxidant and antimicrobial studies of cinnamon leaf and bark volatile oils, oleoresins and their constituents. Food Chem Toxicol. 2007; 45:1650-1661.
- [5] Jaganathan SK, Mazumdar A, Mondhe D, Mandal M. Apoptotic effect of eugenol in human 44

colon cancer cell lines. Cell Biol Int. 2011; 35:607-615.

- [6] Tao G, Irie Y, Lia D and Keung WM. Eugenol and its structural analogs inhibit monoamine oxidase A and exhibit antidepressant-like activity, Bioorg Med Chem. 2005; 13: 4777–4788.
- [7] Tahir HU, Sarfraz RA, Ashraf A and Adil S. Chemical Composition and Anti-Diabetic Activity of Essential Oils Obtained from Two Spices (*Syzygium aromaticum* and *Cuminum cyminum*). Int J Food Prop. 2016; 19: 2156–2164.