



Review on Thymus Vulgaris

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Abstract

The common thyme plant, *Thymus vulgaris* L., is cultivated all over the world, including Iran. It is a member of the Lamiaceae family and is found in various regions of the Mediterranean and Asia. The volatile oil content of common thyme ranges from 0.8 to 2.6% (often around 1%) and is made up of phenols, monoterpene hydrocarbons, and alcohols in varying concentrations. The main phenolic component of common thyme is often THYMOL. The essential oil derived from *THYMUS VULGARIS* leaves is used in drinks, the cosmetic and pharmaceutical sectors, and as a herb in food preparations. Thyme oil has a variety of therapeutic uses, including antispasmodic, carminative, antiseptic, anthelmintic, expectorant, antimicrobial (fungi and bacteria), antirheumatic, antioxidant, natural food preservative, and mammalian age delaying. According to reports, thyme VOLATILE OIL is one of the top ten essential oils that play a significant role in the developing global market..

Keyword: Thyme, Antidiabetic, Antilipidemic, Antitumor, Antimicrobial

Introduction

Over the past few decades, the world has tended to use medicinal plants and herbs such as celery, cloves, coriander, thyme, and black cumin to improve immune responses, reproductive efficiency, and general health. Thyme is an important aromatic plant in the Mediterranean flora and is used in traditional medicine and as a spice.

Several studies have reported that Thyme has the following active biological effects: Antifungal , Antibacterial , Antioxidant , Anti-Tavadism , antispasmodics and insecticides

Plants produce phytochemicals to defend themselves against bacteria, viruses and fungi, but when added to food they also prevent food from spoiling. In light of recent studies that point out, there is a lot of interest in the use of natural preservatives in food. In addition, natural preservatives improve human health as they protect against disease.

Today, the natural plant extracts industry drives millions of euros worldwide. Approximately 1340 plants are known to be potential sources of antioxidant and antimicrobial compounds, and over 250,000 plant species contain a wide variety of bioactive compounds. In 1999 alone, the global business selling natural nutritional supplements exceeded \$15 trillion, including \$7 trillion in Europe and \$3 billion in North America.

And sales are growing every year. Plant extracts belong to the group of additives "Aromas and Flavourings", which includes "all natural products and corresponding synthetic products" and can be consumed by all animal species without restrictions on product dosage. These products have been so well accepted by consumers that they represent one of the future potential replacements for synthetic preservatives and the search for new substances represents an important research area in the field of food additives. All of this has led to the use of natural preservatives either added directly to food or incorporated into the diet of the feeding species.



Review of Literature Chemical Composition

The Lamiaceae family includes the principal therapeutic herb thyme (*Thymus vulgaris* L.) (Masada, 1976).

The primary phenolic compounds of *Thymus vulgaris* are carvacrol (5-isopropyl-2-methyl phenol) and thymol (5-methyl-1-2-isopropyl phenol), which together make up around 20-55% of the extract of thyme. Numerous studies show that thyme volatile oil is one of the primary essential oils used in food production as well as cosmetics as antioxidants

and preservatives. The primary components of the essential oil of thymus vulgaris are the phenol isomer carvacrol and the terpenoid thymol, which have antimicrobial, antioxidant, antibacterial, antitussive, antispasmodic, and expectorant properties. Thymus vulgaris L. also has phenolic acid, terpenoids, and flavonoids glycosides.

The flavonoids (such as thymosin, cirsilineol, and 8-methoxycirsilineol), caffeic acid, triterpenoids, aliphatic aldehydes, long-chain saturated hydrocarbons, and "Labiatae tannin" (Rosmarinus acid) are additional active biochemical substances of the thyme species.

Antidiabetic Effects

Recently, there has been increasing interest among researchers in the medicinal plant for the treatment of hyperglycaemic conditions.

Several researchers have proposed the use of these plants for specific diseases such as diabetes, due to the different biological effects of these plants.

Thyme recommended among plants with antidiabetic activity. Aqueous

thyme extract showed antihyperglycemic effects in alloxan-induced hyperglycemic rabbits and had no effect on body weight. Because of the plant's ability to increase glucose clearance from circulation, reduce glucagon release or insulin surge, reduce glucose uptake from the gastrointestinal tract, or directly stimulate peripheral tissues for glycolytic processes.

Antilipidemic Effects

The antilipidemic potential of thyme might be due to its constituent of active biological agents, many researchers suggested that carvacrol and thymol could reduce plasma cholesterol concentration, it elevates the action of microsomal geranyl pyrophosphate pyrophosphatase. The constitutional variety of the isoprenoids could inhibit the synthesis of cholesterol due its ability to rise the effect of pyrophosphatase Thymoquinone is considered important derivative of thymol due to its antilipidemic activity. Several researchers revealed the antihyperglycemic and antilipidemic effects of volatile oil of Thyme. The decrement in LDL concentration may be attributed to the compounds of oil thyme that possess antioxidant potential that inhibit peroxidation of lipid, subsequent LDL declines, and inhibit fat decomposition, furthermore, the flavone is one constituents of thyme oil owning the antioxidant properties that decrease triglycerides and cholesterol concentration, causing lipid depression.

Antitumoral Activity

Antitumoral effects of thyme, specially the two pure compounds carvacrol and thymol, attributed to their cytotoxic action on tumour cells, several researchers showed thyme carvacrol is the most important cytotoxic product against P815 mastocytoma cell line, Indeed, essential oils with high amount of carvacrol have more cytotoxic activity .

It concluded that the essential oil of thyme has an important in vitro cytotoxic effects against human ovarian adenocarcinoma cells that are resistant to chemotherapeutic agents as well as a significant antitumor effect in mice, due to the biological active components of thyme like carvacrol and thymol. This multicomponent of natural products are effective in preventing growth of tumour in mice and subsequently delaying animal mortality.

The mechanism of thyme's cytotoxic action may be due to its lipophilicity, which causes the accumulation of volatile plant compounds in the cell membrane, leading to its increased permeability which then causes leakage of metabolites and enzymes.

Antimicrobial Activity

Thyme's antimicrobial activity depends on its chemical composition, especially the thyme essential oil. It demonstrated the efficacy of thyme essential oil

against food-borne bacteria and fungi. The antimicrobial activity of thyme essential oil is related to the content of phenolic compounds (thymol) or terpene hydrocarbons. The third main active ingredient in thyme is p-cymene, according to its proportions, which shows synergistic antibacterial effects in combination with gamma-terpinene and thymol. Thymol and carvacrol have antibacterial and antifungal effects. In addition, the antibacterial mechanism of carvacrol and thymol is based on their ability to lyse the bacterial outer membrane, affecting pH homeostasis and inorganic ion balance, resulting in lipopolysaccharide release and increased permeability.

Thyme essential oil has the ability to prevent the growth of *E. coli* in vitro. Other researchers found that thymol inhibited the growth of *S. typhimurium* and *E. coli*. Dorman and Deans, reported that thymol, the main component of thyme essential oil, has antibacterial properties. *Thymus serpyllum* and *Thymus vulgaris* essential. He found that the oil has antibacterial activities. This is directly proportional to his thymol content. Various essential oils of thyme are also used in vaporizers against various yeasts, human pathogens Gram-negative and Gram-positive bacteria. It found that extracts of Thyme oil failed to kill *Klebsiella pneumoniae* or *Salmonella cholerae* and *Staphylococcus aureus*, but successfully inhibited the growth of *Candida albicans* and *Pseudomonas aeruginosa* found that thyme oil was effective against canonical and clinical strains belonging to *Staphylococcus* spp., *Enterococcus* spp.

Antifungal Activity

Several studies have shown that thyme has antifungal activity. De Lira-Mota et al. reported that *T. vulgaris* essential oil was thought to be antifungal, causing disruption of ergosterol membranes, causing to lose its intracellular components and the production of sporangiospores. We have shown that it can be used to treat *Mucor* mycosis because it inhibits germination and development of mycelium. Thyme essential oil, rich in thymol and other antifungals, has been used at low concentrations to disinfect mouldy walls in apartments. Rasooli and Owlia found that the main targets of thyme oil were the cell walls and membranes of *Aspergillus parasiticus*, resulting in suppression of *Aspergillus parasiticus* growth and its aflatoxin production, and Organelles from fungal cells inactivate key enzymes that cause reactions with proteins in the cell membrane or functionally disrupt genetic material.

Conclusion

Thyme is a medicinal plant used as a flavouring agent in food, and its powders, extracts, oils and other products contain antioxidant, antidiabetic, antidiabetic, antioxidative, antidiabetic, antioxidative, thyme active ingredients such as carvacrol and thymol. It has lipidaemia, antitumor, and antibacterial effects. In combination, it is attributed to other biological components.

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