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AN OVERVIEW ON MEDICINAL IMPORTANCE OF *THYMUS VULGARIS*

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ABSTRACT

Herbs are ordering a comeback and natural "renaissance" is going on everywhere on the planet. Dazzle dependence on synthetics is over and individuals are coming back to the naturals items because of safety. Out of 2, 50,000 higher plant species on earth, more than 80,000 types of situation is declared in some important ways remedial and about 5000species have a characteristic value analeptic. Thyme (Thymus vulgaris L., Lamiaceae) is an aromatic and medicinal herb that has been widely used in folk medicine , food preservatives and phytopharmaceutical preparations. The therapeutic potential of thyme rests on contents of flavonoids, thymol, carvacrol, eugenol, aliphatic phenols as well as luteolin, saponins, and tetramethoxylated flavones. Various thyme extract pharmacodynamic activities and the essential oil, respectively, demonstrated in vitro, but availability of these compounds in the respective target organs has not been proven yet.

Keywords: *Thymus vulgaris,* Essential oil, Thymol, Medicinal plant.

1. INTRODUCTION

Medicinal plants are used in many countries as an alternative to synthetic drugs. Scientists are now paying attention towards herbal extracts to act as microbial agent due to rise in bacterial resistance to antibiotics which increasingly led to world health issue. Various spices and herbal extracts are used for preservation of food, also some are used as appetizers and many of them are used medicinally in old times (Mousavi *et al.*, 2011). Medicinal herbs are high natural source of medicinal products used in traditional medicine and chemical entities for modern drugs. Medicinal plants are largely used either directly (home remedies) or indirectly (modern medicines) by all sectors of population (Srinivasan *et al.*, 2001).

Among the economically important plants, medicinal and aromatic plants have played a key role in reducing human misery(Baquar, 2001). Other economic uses of medicinal plants include supplying fruits and vegetables, browse for livestock and timber for fuel. Medicinal plants contain synergistic and/or side effects neutralizing combinations which is the major reason for them to be used in medicines (Gilani and Atta-ur-Rahman, 2005). According to World Health Organization (WHO), the best source to obtain variety of drugs is medicinal plants. Traditional medicines that are utilized by 80% of the population in developed countries have compounds derived from herbal plants (Arunkumar and Muthuselvam, 2009). Morphine isolation from opium in early 19^{th} century led to the isolation of active compounds from plants that are used in medicine in recent years (Kinghorn, 2001).

Medicinal value of the plant is relies on the presence of different phytochemical components (tannins, alkaloids, terpenoids and phenolic compounds) that bring particular physiological effect in human body (Hill, 1952). This review is aims to draw attention toward the medicinal importance of *Thymus vulgaris*. Many medicinal activities of thyme can be attributed to its essential oil. Medicinal plants contain combinations of several chemical compounds having multiple biological activities. Medicinal plants have become the subject of recent extensive studies in terms of conservation and whether their traditional uses are supported by actual pharmacological effects or simply based on folklore.

1.1. *Thymus Vulgaris*

Thymus vulgaris (Thyme) is a little perpetual therapeutic botanical herb belongs to lamiaceae family which is one of the biggest families and generally notable blossoming plants, with around the range of 220 genera and practically 4000 species worldwide. Additionally it is known as common thyme and it is indigenous to Mediterranean region, to the North Africa and several parts of Asia along with carefully discriminating in areas of the entire world. Typically grow as a sub-shrub

Figure-1.*Thymus Vulgaris.*

from 5 to 30cm in height with fibrous ligneous root and small, greenish-grey leaves having narrow edged (Al-Rawi, 1988). It has numerous hard, branched stems (10-20cm tall) and flowers blooming from May to September having distinctive fragrance may white or purple in color (Figure 1). Due to its strong aroma that is because of thymol, it is grown widely as culinary herb.

1.2. Pharmaceutical Importance of *Thymus vulgaris*

Thyme has long history of been used in traditional medicine for treatment of various diseases for instance to treat respiratory diseases (whooping cough, bronchitis and asthma), in the form of tea, ointment, tincture, syrup or by steam inhalation. It is also used to prevent hardening of the arteries, treatment of toothache, urinary tract infection and dyspepsia (Hashim and Gamil, 1988). It also expels fungus from stomach and intestine and it has ability to increase appetite because of its important component thymol, which has ability to kill bacteria and parasites. Different studies were carried out in last decades to reveal reported pharmacological activities of *Thymus vulgaris* both of plant extracts and essential oil. In mice analgesic and antipyretic properties where reported for thyme extracts (Mohsin *et al.*, 1989). Thyme has changed from a traditional herb to a serious drug rational phytotherapy. It is incredible wellspring of iron, calcium, manganese, vitamin K and likewise upgrades blood flow and pushes an invigorating impact for the entire system. This herb invigorated activity on anxious framework made it as a cure for physical and mental weakness and additionally for diminishing insomnia. The remedial potential of *Thymus vulgaris* is due to the presence of flavonoids, thymol, carvacrol, eugenol, phenols, luteolin and tetramethoxylated. Its controls numerous valuable effects, such as, antispasmodic, bactericides, antiseptics, antioxidants, anthelmintic properties and has late been recommended as substitute as cancer prevention agent (Monira *et al.*, 2012).

1.3. Oil Constituents of *Thymus vulgaris*

The use of thyme oil is documented for medicinal purposes since 1589. From many decades, the essential oil of *Thymus vulgaris* been published in pharmacopoeias and standard text books of phytotherapy (Martindale, 1972). Volatile phenolic oil of thyme has been reported amongst the top 10 essential oils (Letchamo and Gosselin, 1996).

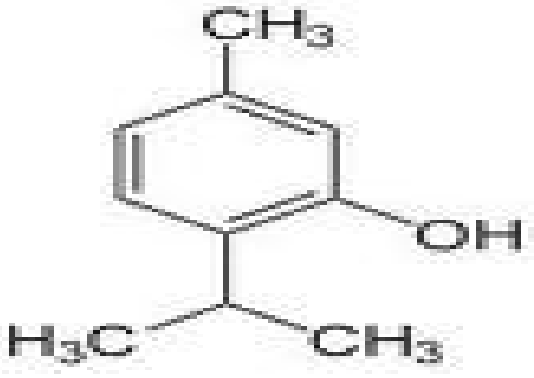
Thyme oil contains 46% phenols of which 44% thymol and 3.6% carvacrol and also important components It is confirmed by various studies confirmed that thyme oil contains polyphenolic acid (oleanic acid, rosmarinic acid, triterpene and caffeic acid). Thyme oil also contains other components such as thymol, borneol, gerniol, pinen, linalool, cineol, sabinen, myrcen limonene and cymene (Rizk, 1986).

2. CHEMICAL CONSTITUENTS

2.1. Thymol

Thymol (2-isopropyl-5-methylphenol**)** is monoterpenoid phenol, major compound put forth in *Thymus vulgaris* and different plants having a place with the Lamiaceae family (Buckingham, 1994). It is white-colored crystalline compound possessing aromatic odor and has strong antiseptic, antioxidant, antibacterial and antifungal properties (Aeschbach *et al.*, 1994; Cosentino *et al.*, 1999; Venturini *et al.*, 2012).

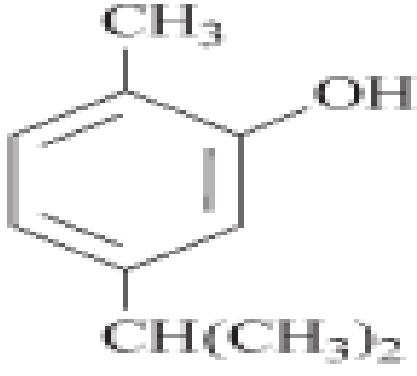
Figure 2. Thymol (Aly *et al.*, 2005).



2.2. Carvacrol

Carvacrol (5-isopropyl-2-methylphenol; mol. wt. 150.21) is also monoterpenoid phenol present in essential oil of *Thymus vulgaris* and many other aromatic herbs and spices. For carvacrol many biological effects are reported including antithrombotic (Enomoto *et al.*, 2001), anti-inflammatory (Sosa *et al.*, 2005), antimicrobial (Ben Arfa *et al.*, 2006) and acetyl cholinesterase inhibitory properties (Jukic *et al.*, 2007).

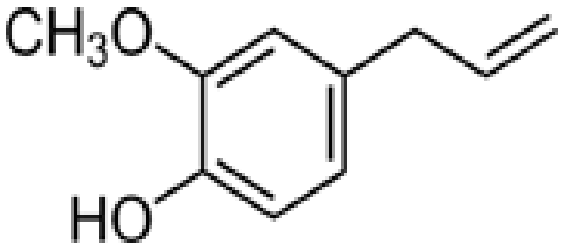
Figure 3. Carvacrol (De Vincenzi *et al.*, 2004).



2.3. Eugenol

Eugenol (2-methoxy-4-(2-propenyl) phenol) present in many medicinal herbs and is used in dentistry for decades due to its analgesic properties. It possesses activities of anti-convulsive and hypothermic agent. In addition, eugenol displays other pharmacological properties anti-inflammatory (Reddy and Lokesh, 1994), neuro-protective (Wie *et al.*, 1997), anti-bacterial (Laekeman *et al.*, 1990) and anti-anaphylactic (Jadhav *et al.*, 2004).

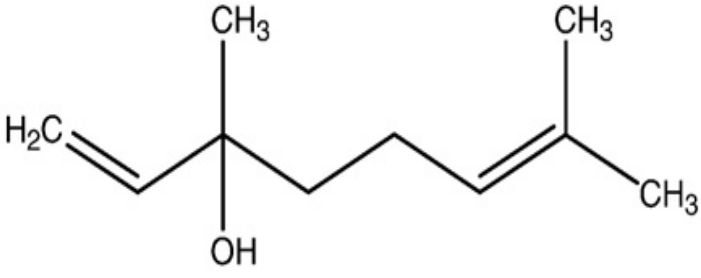
Figure-4. Eugenol (Park *et al.*, 2011)



2.4. Linalool

It is monoterpene alcohol compound which constitutes as major volatile component in several aromatic plant species essential oil and also present in *Thymus vulgaris* (Elisabetsky *et al.*, 1995). Studies indicates that this compound possesses antiviral effect, anti-inflammatory, antioxidant, anti-nociceptive properties as well as, analgesic and local anesthetic activities

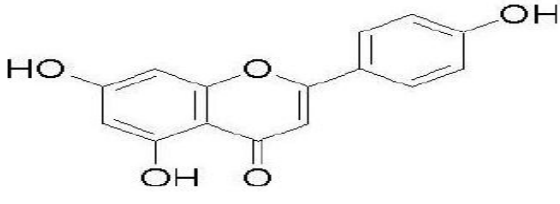
Figure 5. Linalool (Bagetta *et al.*, 2010).



2.5. Apigenin

Apigenin is a flavonoid (4', 5, 7,-trihydroxyflavone; Mol Wt. 270). Various studies confirmed that it exhibits anti-mutagenic, anti-carcinogenic, anti-inflammatory, anti-progression, anti-inflammatory, anti-viral and anti-oxidant properties (Birt *et al.*, 1986). In recent years, it gained particular interest as a useful and health promising agent as compared with other structurally related flavonoids because of its low intrinsic toxicity and prominent effects on normal vs. cancer cells.

Figure 6. Apigenin (Patel *et al.*, 2007).



2.6. Rosmarinic Acid

Rosmarinic acid (3, 4-dihydroxyphenyl-lactic acid) is present in *Thymus vulgaris* and many other plants including with the lamiaceae family. It possesses anti-mutagen, anti-oxidative, anti-inflammatory, anti-viral and anti-allergic. Rosmarinic acid is rapidly eliminated from the blood circulation after intravenous administration and shows low toxicity with LD_{50} in mice with 561 mg kg^{-1} (Parnham and Kesselring, 1985).

Figure 7. Rosmarinic acid (Petersen and Simmonds, 2003).

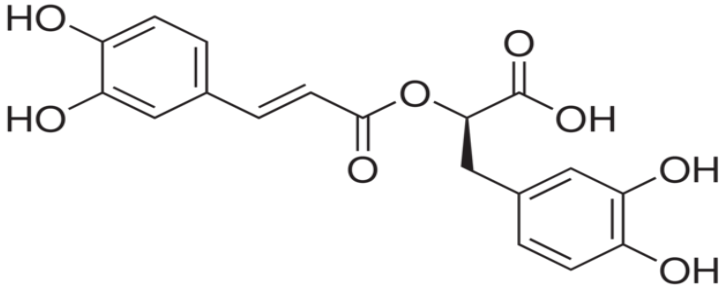


Table-1. List of selected Chemical Constituents in *Thymus vulgaris*

Chemical constituent	Biological activities	References
Thymol	Antiseptic, antibacterial, antifungal and antioxidant properties.	(Aeschbach *et al.*, 1994; Cosentino *et al.*, 1999; Venturini *et al.*, 2012).
Carvacrol	Antimicrobial, antithrombotic, anti-inflammatory, acetyl cholinesterase inhibitory properties.	(Enomoto *et al.*, 2001; Sosa *et al.*, 2005; Jukic *et al.*, 2007).
Linalool	Antiviral effect, anti-inflammatory, antioxidant, anti-nociceptive as well as analgesic activity.	(Elisabetsky *et al.*, 1995; Usta *et al.*, 2009; Bagetta *et al.*, 2010; Coelho *et al.*, 2011).
Apigenin	Anti-carcinogenic, anti-inflammatory, anti-progression, anti-inflammatory, anti-viral and anti-oxidant properties	(Birt *et al.*, 1986; Patel *et al.*, 2007; Shukla and Gupta, 2010).
Eugenol	Neuro-protective, anticancer, anti-bacterial and anti-anaphylactic activities	(Laekeman *et al.*, 1990; Atsusane, 1991; Wie *et al.*, 1997; Jadhav *et al.*, 2004).
Rosmarinic acid	Astringent, anti-allergic, anti-mutagen, anti-oxidative and anti-inflammatory.	(Parnham and Kesselring, 1985; Petersen and Simmonds, 2003).

3. CONCLUSION

Plants therapeutic amenities are utilized in different medication preparations, it is anticipated that universal Ayurveda, Chinese treatments and several additional will sold decades ahead of time globally. Due to vicinity of different chemical substances, herbs display their advantageous effects. In past, *Thymus vulgaris* is distinguished to have favorable consequences for diverse sort of illnesses and different bioactive constituents extracted have various helpful medicinal impacts. In

conclusion, the whole plant should receive particular attention in research to develop new agents of pharmaceutical importance.

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