

Review on *Thymus vulgaris* Traditional Uses and Pharmacological Properties

Prasanth Reddy V^{1*}, Ravi Vital Kandisa¹, Varsha PV¹ and Satyam S²

¹Department of Biotechnology, GITAM Institute of Technology, GITAM University, Visakhapatnam, India

²Department of Biotechnology, Mahatma Gandhi University, Nalgonda, India

Abstract

Medicinal plants have played an essential role in the development of human culture. Medicinal plants are resources of new drugs and many of the modern medicines are produced indirectly from plants. It is estimated there are more than 2,50,000 flower plant species. Studying medicinal plants helps to understand plant toxicity and protect human and animals from natural poisons. This article aims to provide a comprehensive review on the and pharmacological aspects of *Thymus vulgaris*. It is obtained from European countries, together with France, Svizzera, Spain, Italy, Bulgaria, Portuguese Republic and Ellas. *Thymus vulgaris* oil is a combination of monoterpenes and those will acts as antioxidative, antimicrobial, medicinal drug, antitussive, antispasmodic, and antibacterial activities.

Keywords: *Thymus vulgaris*; Thyme; Oxygenated Monoterpenes; Insecticidal activity; Carvacrol

Introduction

Thymus vulgaris is a flowering plant in the mint family Lamiaceae. It is growing upto 15-30 cm tall by 40 cm wide [1]. Thyme is cultivated in most of the European countries, together with France, Svizzera, Spain, Italy, Bulgaria, Portuguese Republic and Ellas. Yield and quality of oil varies in line with the genetic make-up of stuff, crop maturity at harvest, setting and distillation follow.

Plant description

Thyme is a tiny perennial shrub, with a semievergreen groundcover that seldom grows quite 40 cm tall it's each horizontal and upright habits. The stems become woody with age. Thyme leaves are terribly little, usually 2.5 to 5 mm long and vary significantly in form and hair covering, depending on the variety, with every species having a rather completely different scent. *T. vulgaris* leaves are oval to rectangular in form and some what fleshy aerial components are used for volatile oil production, principally by steam distillation. The contemporary and dried herb market uses it for cookery functions (Figure 1).

Thyme grows well during a temperate to heat, dry, sunny climate,



Figure 1: *Thymus vulgaris*.

and wherever the plants don't seem to be shaded. It desires full sun to grow to its best potential. Thyme doesn't like excessive wet as a result of its condition it will gets rot diseases. Thyme prefers lightweight, well-drained soils with a pH of 5.0 to 8.0. Thyme species do best in coarse, rough soils that may be unsuitable for several alternative plants.

The dried product should be processed to get rid of the leaves from the stems, and so sieved to get rid of dirt and to provide a consistent product. Many strategies exist from sun to classy driers. The employment of sun-drying strategies leads to poor quality of the volatile oil. Artificial drying strategies permit higher management of product quality. A forced air-flow drier could be a appropriate system to dry better-quality leaves. Thymeshould to be dried at temperatures not up to 40°C to cut back loss of flavor through volatilisation of volatile oil, and to keep up a decent inexperienced color. once drying, the leaves should be separated clear of the stems, sieved and hierarchic. Fresh turn out has got to be clean of foreign material and looking out recent and tender with a decent color and flavour.

There is an International Standard (ISO 6754:1996), prescribing quality necessities for dried thyme. The quality prescribes bound necessities of the finished product. The volatile oil content of the dried herb is a vital issue contributory to the flavour intensity. Whole thyme leaves should contain a minimum of 0.5% essential oil, that equals 5 ml/kg dried herb, and ground thyme should contain a minimum of 0.2% volatile oil to satisfy the wants. Thyme volatile oil should be hold on in a very cool, dry space till it's used. Keep it in dark, air-tight glass bottles and don't expose it to heat or serious metals. Once opened, refrigeration and tightly closing the cap can prolong its shelf-life. Deterioration begins if the liquid is far darker or a lot of viscous than traditional.

***Corresponding author:** Prasanth Reddy V, Department of Biotechnology, GITAM Institute of Technology, GITAM University, Visakhapatnam, India, Tel:+91-9848546520; E-mail: prasanthreddybio@gmail.com

Received July 05, 2014; Accepted August 20, 2014; Published August 26, 2014

Citation: Prasanth Reddy V, Ravi Vital K, Varsha PV, Satyam S (2014) Review on *Thymus vulgaris* Traditional Uses and Pharmacological Properties. Med Aromat Plants 3: 164. doi: 10.4172/2167-0412.1000164

Copyright: © 2014 Prasanth Reddy V, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Taxonomic Classification

Kingdom: Plantae
Class: Magnoliopsida
Order: Lamiales
Family: Lamiaceae
Subfamily: Nepetoideae
Genus: *Thymus* L.
Species: *Thymus vulgaris* L. [2]

Medicinal uses

Thyme has been thought of to be antiseptic, antimicrobial, medication, astringent, anthelmintic, medicinal drug, carminative, disinfectant, medicinal drug and tonic. Thyme is incredibly useful in cases of assorted intestinal infections and infestations, like hookworms, ascarids, gram-positive and gram-negative bacterium, fungi and yeasts as well as *Candida albicans*. Its active constituent, thymol, is active against enterobacteria and cocci bacteria. Thyme may also improve liver functioning, and act as an appetite stimulant. It will be used in treatment of cartilaginous tube, bronchial and urinary infections. Used as a gargle, Thyme is helpful in treatment of laryngitis and inflammation. The main component of the volatile oil of thyme, thymol, is active against enterobacteria and cocci bacteria.

It is used for skin issues like oily skin, sciatica, acne, dermatitis, skin condition and bug bites. In aromatherapy, the distinct types, thymol, 'red thyme oil', linalol kind for its terribly light soft action and thuyanol for antiviral properties are used. A corrected product, 'white thyme oil' is also used, and it's milder on the skin. Applied to the skin, thyme relieves bites and stings, and relieves neuralgic and rheumatic aches and pains.

Anti Inflammatory Property

Thymus vulgaris oil is a combination of monoterpenes. The most compounds of this oil are the natural terpenoid thymol and its phenol chemical compound carvacrol [3,4] that have antioxidative, antimicrobial, medicinal drug, antitussive, antispasmodic, and antibacterial effects [5,6]. Terpenoids, flavonoid aglycones, flavonoids glycosides, and synthetic resin acids were additionally found in *Thymus* spp.

Anti bacterial activity

The essential oils obtained from *Thymus vulgaris* L. harvested at 4 biological process stages were evaluated for their biological activity and chemical components. The thyme volatile oils were analysed for their inhibition effects against 9 strains of gram-negative bacteria and 6 strains of gram-positive bacteria. The bioimpedance methodology was chosen for finding out the antibacterial activity of the essential oils and also the parameter chosen for outlining and quantifying the antibacterial activity of the thyme oils was the detection time. The plate counting technique was used to studying the inhibitory effect by direct exposure. All the thyme essential oils examined had a significant bacteriostatic activity against the microorganisms tested. This activity was additional marked against the gram-positive bacteria. The oil from thyme fully flower was the foremost effective at stopping the growth of the microorganism species examined. The oils tested were conjointly shown to possess smart antibacterial activity by direct contact, that gave the impression to be a lot of marked against the gram-negative

microorganism. some a number of of the species were capable of recovering a minimum of 50% of their metabolic function once contact with the inhibitor, whereas most of the strains were shown to have been inactivated almost completely [7].

Chemical Composition of the Essential Oil

The essential oil from *T. vulgaris* showed a high content of oxygenated monoterpenes (56.53%) and low contents of monoterpene hydrocarbons (28.69%), sesquiterpene hydrocarbons (5.04%) and oxygenated sesquiterpenes (1.84%) [8]. The predominant compound among the essential oil components was thymol (51.34%) while the amount of all other components of the oil was less than 19%.

Anti viral property

Silke Nolkemper et al. conducted an experiment with aqueous extracts from species of the Lamiaceae family were examined for their antiviral activity against Herpes simplex virus (HSV). Extracts from thyme (*Thymus vulgaris*) has shown inhibitory activity against Herpes simplex virus type 1 (HSV-1), type 2 (HSV-2) and an acyclovir-resistant strain of HSV-1 was tested in vitro on RC-37 cells in a plaque reduction assay [9].

Antioxidant properties

An antioxidant is a molecule that inhibits the oxidation of different molecules. oxidation is a chemical process that transfers electrons or hydrogen from a substance to an oxidizing agent. oxidation reactions will produce free radicals. In turn, these radicals will begin chain reactions. once the chain reaction happens in a cell, it will cause damage or death to the cell. Antioxidants stops these chain reactions by removing free radical intermediates, and inhibit different oxidation reactions.

The leafy parts of thyme and its oil are utilized in foods for the flavor, aroma and preservation and additionally in folk medicines. El-Nekeety conducted an experiment to work out the elements of *Thymus vulgaris* L. oil and to evaluate the protecting effects of this oil against aflatoxin-induced oxidative stress in rats. The results indicated that the oil contains Carvacrol (45 mg/g), Thymol (24.7 mg/g), β -Phellandrene (9.7 mg/g), essential oil (4.1 mg/g), Humulene (3.1 mg/g), α -Phellandrene (2.3 mg/g) and Myrcene (2.1 mg/g) [10]. However, α and β -pinene, Myrcene, α -thujone, Tricyclene, 1, 8-cineole, and β -sabinene were found in very lower concentrations. Treatment with aflatoxins alone disturbs lipid profile in blood serum, decreases total antioxidant capability, increase creatinine, uric acid and nitric oxide in blood serum and lipid peroxidation in liver and excretory organ attended with a sever histological changes within the liver tissues. The oil alone at the 2 tested doses didn't induce any important changes within the biochemical parameters or the histological image. The combined treatment showed important enhancements altogether tested parameters and histological footage within the liver tissues. Moreover, this improvement was additional pronounced within the cluster received the high dose of the oil.

Insecticidal activity

The insecticidal activity of thyme volatile oil, thymol and carvacrol was evaluated in laboratory against completely different larval stages of lesser mealworm. The sooner and later larval stages were reared on diets containing one or two acetone solutions of tested compounds. Insecticidal activity of thyme volatile oil and pure monoterpenes against *A. diaperinus* larvae relied on the dose and age of larvae. the growth of younger larvae was considerably affected, whereas those of

older larval stage was less influenced and only by pure oil components. In young larvae the application 1% thyme oil, thymol and carvacrol, caused mortality of 50.0, 86.67 and 85%, respectively [11].

Conclusion

The present study showed that the extract of *Thymus vulgaris* plant contain high amount of flavonoids, and exhibited antioxidant and antibacterial activity. So, thyme can be used as an easily available source of natural antioxidants and antibiotics in food products and drugs. However many experiments illustrating its potentiality towards many diseases, more clinical and pathological studies must be conducted to investigate the unexploited potential of the *Thymus vulgaris* plant.

References

1. Christopher Brickell (2008) RHS A-Z encyclopedia of garden plants. Dorling Kindersley, United Kingdom.
2. http://bioweb.uwlax.edu/bio203/s2012/disrud_sama/classification.htm
3. Amiri H (2012) Essential oils composition and antioxidant properties of three *Thymus* species. Evid Based Complement Alternat Med 2012: 728065.
4. Nickavar B, Mojab F, Dolat-Abadi R (2005) Analysis of the essential oils of two *Thymus* species from Iran. Food Chemistry 90: 609-611.
5. Höferl M, Buchbauer G, Jirovetz L (2009) Correlation of antimicrobial activities of various essential oils and their main aromatic volatile constituents. Journal of Essential Oil Research 21: 459-463.
6. ESCOP (2007) ESCOP Monographs: The Scientific Foundation for Herbal Medicinal Products. The European Scientific Cooperative on Phytotherapy in collaboration with Georg Thieme.
7. Marino, Marilena, Bersani, Carla Comi, et al. (1999) Antimicrobial Activity of the Essential Oils of *Thymus vulgaris* L. Measured Using a Bioimpedometric Method. J Food Prot 62: 1017-23.
8. Maher Ali Ahmed Al.Maqtari, Saeed Mohammed Alghalibi, Ebtesam Hasan Alhamzy (2011) Chemical composition and antimicrobial activity of essential oil of *Thymus vulgaris* from Yemen. Turk J Biochem 36: 342-349.
9. Silke Nolkemper, Jürgen Reichling, Florian C. Stintzing, Reinhold Carle, Paul Schnitzler (2006) Antiviral Effect of Aqueous Extracts from Species of the Lamiaceae Family against Herpes simplex Virus Type 1 and Type 2 in vitro. Planta Med 72: 1378-1382.
10. El-Nekeety AA, Mohamed SR, Hathout AS, Hassan NS, Aly SE, et al. (2011) Antioxidant properties of *Thymus vulgaris* oil against aflatoxin-induced oxidative stress in male rats. Toxicol 57: 984-991.
11. Szczepanik M, Zawitowska B, Szumny A (2012) Insecticidal activities of *Thymus vulgaris* essential oil and its components (thymol and carvacrol) against larvae of lesser mealworm, *Alphitobius diaperinus* Panzer (Coleoptera: Tenebrionidae). Allelopathy Journal 30: 129.