
Research Article



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TO STUDY THE HERBALISM OF THYME LEAVES

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Abstract

Thyme is commonly used as a culinary herb and is characterized by its volatile oil containing Thymus vulgaris L. Thymus zygis L. (Labiatae/Lamiaceae). Documented pharmacological actions support some of the traditional medicinal uses, which have been principally attributed to the volatile oil and flavonoid constituents. Thyme should not be ingested during pregnancy and lactation in quantities greater than those found in foods. Thyme is stated to possess carminative, anti-asthmatic, antispasmodic, antitussive, expectorant, secretomotor, bactericidal, anthelmintic and astringent properties. Traditionally, it has been used for dyspepsia, chronic gastritis, asthma, diarrhoea in children, enuresis in children, laryngitis, tonsillitis (as a gargle), and specifically for pertussis and bronchitis.

Key words: Clinical studies, Side effect, Toxicity, Preclinical data, Contraindications warnings.

Introduction

Herbalism is the study of medicinal properties and usage of plant and their related Activity and biological background as well as safety approaches to needs clinical tests and prevalence use of health livings. This article is about leaves and oils of the Herbalism of thyme plant. For the genus of thyme Plants, Thymus (Genus). For the Active ingredient in thyme oil and thymol.

Thyme extract is known to possess spasmolytic effects on isolated trachea and to increase ciliary activity. A small part of this effect is mediated via β -2 receptors, but other receptors are supposed to be involved. Endothelin has a pathophysiological impact in asthma with

respect to hyper-reagibility and contracting isolated trachea smooth muscles and was, therefore, investigated. Thyme extract inhibited endothelin-induced contraction. E_{max} decreased depending on the concentration of thyme extract indicating a non-competitive inhibition. Bosentan, an endothelin receptor antagonist (positive control), acted as a competitive inhibitor. The interaction/combination of thyme extract and bosentan was additive but not supra-additive indicating an interaction with the endothelin system. Thymol (one of the major compounds of thyme extract) did not interact with the endothelin system¹. It is concluded that thyme extract may help in diseases related to

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endothelin hyper-reagibility of the bronchus system such as asthma and COPD (chronic obstructive pulmonary disease), although thymol is not involved in this effect. However, robust clinical research assessing the efficacy and safety of thyme is limited. The oil is toxic and should not be ingested and only applied externally if diluted in a suitable carrier oil. It has been suggested that standardised thyme extracts based on the phenolic volatile components may not be appropriate because antispasmodic actions previously attributed to these compounds may be attributable to other constituents isolated from herbs such as thyme members of the menthane family in which the cyclohexane structure has been oxidized to an aromatic (phenolic) ring. Oils containing these phenolic terpenes have been shown to be particularly effective as antibacterial agents. thyme contain lipophilic methylated flavones aglycones².



Thyme and Thyme oil¹

Thymus vulgaris and *Thymus Zygis* are mixtures of both are official in the EP and BP. The drug consists of whole leaves and flowers with stems exceeding specified Limites a 10 % .The minimum requirement for volatile oil content is 1.2% v/w with a phenol value of not less than 0.5% Expressed as thymol and calculated with reference to the anhydrous Drug. The phenols in the isolated oil are determined by reaction with aminopyrazolone and potassium ferricyanide in ammoniacal solution with subsequent measurement of absorbance at 450 nm. A number of chemical races, e.g. 'thymol' and 'carvacrol' types are known and it is the pheno that are held largely responsible for the antiseptic, antitussive and expectorant properties of thyme. The spasmolytic effect may be due to the flavonoids of the leaves. Biphenyls reported in 1989 have deodorant properties.(*T.serpyllium* wild thyme),included in the BHP. is not admitted bythe B P and is detected by chalacteristic Long trichomes at the base of leaves Which are Weakly Pubescent in other parts. The volatile oil of *T. serpyllium* contains more linalool and P-cymol than do the official species.

Thyme oil BP.

Thyrne oil BP is obtained by stean.distillation from the fresh aerial parts and contains thymol 36-55%, Carvacrol 1-4% , P-cymene 15-28%, gamma- terpene 5-10% together with linalool. Beta –mycrene and terpinen-4 -ol as determined by gas chromatography. Spain accounts for some 90% of the world production of thyme oil.

Species (Family)

- *Thymus vulgaris* L.
- *Thymus zygis* L. (Labiatae/Lamiaceae)

Synonyms

Common Thyme, French Thyme, Garden Thyme, Rubbed Thyme

Geographical Source

T. vulgaris is grown and cultivated abundantly in many parts of Europe, Australia and North Asia.

Legal Category (Licensed Products)

GSL(G37)

Constituents

Volatile oils 0.8–2.6%. Pharmacopoeial standard, not less than 1.2%. Phenols as major components (20–80%) primarily thymol and carvacrol; others include p-cymene and g-terpinene (monoterpenes), linalool, α-terpineol, and thujan-4-ol (alcohols); biphenyl compounds of monoterpene origin. Flavonoids Cirsilineol, 8-methoxycirsilineol, thymonin and eriodictyol.

Other constituents : Caffeic acid, oleanolic acid, ursolic acid, rosmarinic acid, resins, saponins and tannins.

Isolation of Thyme oil from thymus***Vulgaris*²**

Preparation Thymol may be extracted from **thyme oil** by agitation with dilute aqueous alkali solution (= 5% w/v in water). The aqueous layer is first separated and subsequently made acidic with dilute acid, when **thymol** gets separated as an oily layer floating on the surface that may be recovered either by extraction with ether or by steam distillation.

Another means of obtaining **thymol from thyme oil** is to subject the latter to very low temperature (–25°C) when thymol separates as crystals.

Description

Colour : Transparent, colourless

Odour : Aromatic thyme—like odour

Taste : Pungent taste

Solubility : In water (1: 1200); in alcohol (1:1), in glycerol (1: 1000); Freely soluble in ether, chloroform, carbon disulphide, benzene and glacial acetic acid; soluble in fixed oil and volatile oil.

Chemical Test ²

1. **Thymol** when fused with phthalic anhydride develops bright violet red to intense red colouration, and on adding dilute alkali it gives an intense blue colouration due to the formation of thymolphthalein.

2. **Thymol** on being dissolved in concentrated sulphuric acid yields the corresponding thymesulphuric acid [C₆H₂(SO₃H) (CH₃).(C₃H₇).OH], which produces a distinct violet colour with ferric chloride solution.

3. An alcoholic solution of **thymol** on being treated with FeCl₃ solution does not produce any coloration.

Note: Carvacrol on identical treatment gives a green colouration.

4. A small crystal of **thymol** is dissolved in 1 ml of glacial acetic acid and to this is added one drop of HNO₃ and six drops of sulphuric acid, when it exhibits a deep bluish green colour.

5. Dissolve 0.1 g of **thymol** in 2 ml of NaOH solution (10% w/v) and heat in a water bath to produce either a clear colourless solution or a pale red solution, that ultimately turns darker in shade on keeping without the separation of oily drops. If the resulting solution is shaken with a few drops of chloroform it gives a violet coloration.

6. **Thymol** forms definite derivatives with various reagents e.g., naphthylurethane derivative (m.p. 160°C); phenylurethane derivative (106-107°C).

Uses

Herbal Use

- Astringent properties,
- Carminative,
- Antispasmodic,
- Antitussive,
- Expectorant,
- Secretomotor,
- Bactericidal,
- Anthelmintic

Indicated Usage

Internal

Asthma, Tuberculosis	Bronchitis
Candidiasis	Colds, flu
Cough	E. Coli / Food poisoning
Fever	Migraine
Mouth ulcers, canker sores	Nightmares
Sore throat, laryngitis	Spastic colon

External

Crabs, lice	Deodorant
Fungal infections	Muscle spasms, cramps
Skin infections, old sores, ulcers	Sty, conjunctivitis

Traditionally, it has been used for dyspepsia, chronic gastritis, asthma, diarrhoea in children, enuresis in children, laryngitis, tonsillitis (as a gargle), and specifically for pertussis and

bronchitis. The German Commission E approved internal use for treating symptoms of bronchitis, whooping cough and catarrh of the (upper respiratory tract). Thyme is used in various combinations with anise oil, eucalyptus oil, fennel oil, fennel fruit, Iceland moss, lime flower, liquorice root, marshmallow root, primrose root and star anise fruit for catarrh and diseases of the upper respiratory Tract. Thymol when dissolved in NaOH solution and treated with an I₂-KI solution it forms thymol iodide that finds its use as an anti-infective and antifungal agent. according to chemical structure The phenolic OH moiety present in **thymol** enables it to form salts of acetate and carbonate easily which are used as antiseptic and anthelmintic respectively².

Typical Preparations

Teas, tinctures, baths, gargles, toothpaste.

Dosage

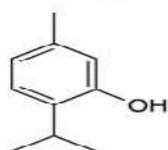
Dosages for oral administration (adults) for traditional uses recommended in older and contemporary standard herbal and pharmaceutical reference texts are given below.

Dried herb 1–4 g as an infusion three times daily; 1–2 g

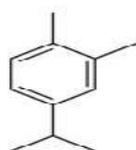
Liquid Extract of Thyme (BPC 1949) 0.6–4.0 mL.

Elixir of Thyme (BPC 1949) 4–8 mL.

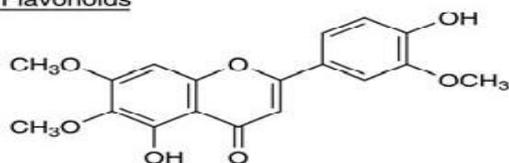
Tincture 2–6mL (1 : 5 in 45% alcohol) three times daily, four drops.

Monoterpenes

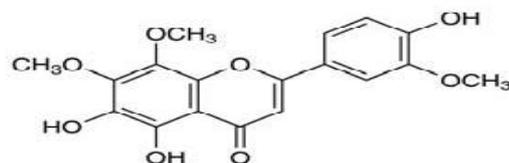
thymol



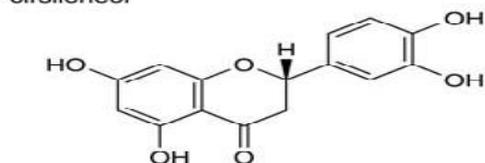
carvacrol

Flavonoids

cirsileneol



thymonin



eriodictyol

Pharmacological Actions

1. Antitussive, expectorant and antispasmodic actions are considered to be the major pharmacological properties of thyme³ and have been associated with the volatile oils (e.g. thymol, carvacrol) and flavonoid constituents. Thyme oil has produced hypotensive and respiratory stimulant effects in rabbits following oral or intramuscular administration, and in cats following intravenous injection; an increase in rhythmic heart contraction was also observed in rabbits.
2. It is a vital component in several analgesic and topical antiseptic formulations in low concentrations ranging between 0.1 to 1% in personal health care products².
3. In vitro antispasmodic activity of thyme and related *Thymus* species has been associated with the phenolic components of the volatile⁴ and with the flavonoid constituents; their mode of action is thought to involve calcium-channel blockage^{3,4,5}. The flavonoids thymonin, cirsileneol and 8-methoxycirsileneol have potent spasmolytic activity in guinea pig trachea preparations in vitro.
4. Analgesic and antipyretic properties in mice have been reported for a thyme extract⁷. Thymol possesses anthelmintic (especially hookworms), antibacterial and antifungal properties. Thymol and thyme oil have antibacterial activity against certain organisms and thymol, carvacrol and thyme oil have antifungal activity against a range of organisms. Thyme oil inhibits prostaglandin synthesis; rosmarinic acid has anti-inflammatory activity, inhibiting complement in rats and some of the functions of polymorphonucleocytes. Rosmarinic acid reduced oedema produced by cobra venom factor in rats, and inhibited passive cutaneous anaphylaxis and impairment of in vivo activation of mouse macrophages by heat killed *Corynebacterium parvum*. Activity may relate to complement inactivation.

Clinical Studies

Generally, well-designed clinical studies assessing the effects of thyme are lacking. A randomized, double-blind, controlled trial involving 60 patients with productive cough compared syrup of thyme and bromhexine over a five-day period. Both groups were similar in self-reported symptom relief.

Side-effects, Toxicity

Clinical Data

There is a lack of clinical safety and toxicity data for thyme and further investigation of these aspects is required. Thyme oil is a dermal and mucous membrane irritant. Toxic symptoms documented for thymol include nausea, vomiting, gastric pain, headache, dizziness, convulsions, coma, and cardiac and respiratory arrest. Thymol is present in some toothpaste preparations, and has been reported to cause cheilitis and glossitis. Hyperaemia and severe inflammation have been described for thyme oil used in bath preparations.

Pre-Clinical Data

A concentrated extract of thyme decreased locomotor activity and caused a slight slowing down of respiration in mice following oral administration of doses of 0.5–3.0 g/kg, equivalent to 4.3–26.0 g dried plant material. In rats, oral LD50 values stated for thyme oil include 2.84 g/kg and 4.7 g/kg in rats, and >5 g/kg following dermal administration⁸. In mice, oral administration of a concentrated ethanol extract of herb in sub acute toxicity tests resulted in increased weights of liver and testes. Also in mice, a dose of 0.9 g daily for three months resulted in mortality rates of 30% and 10% in males and females, respectively. Thyme oil had no mutagenic or DNA-

damaging activity in either the Ames test or Bacillus subtilis rec-assay.

Contra-indications, Warnings

Thyme oil is toxic and should be used with considerable caution. It should not be taken internally and only applied externally if diluted in a suitable carrier oil. Drug interactions None documented. However, the potential for preparations of thyme to interact with other medicines administered concurrently, particularly those with similar or opposing effects, should be considered. Pregnancy and lactation There are no known problems with the use of thyme during pregnancy and lactation, provided that doses do not greatly exceed the amounts used in foods. Traditionally, thyme is reputed to affect the menstrual cycle and, therefore, large amounts should not be ingested.

Result and Conclusion

Thyme leaves having Thymol and thyme Oil effect on Asthmatic, tonsillitis and whooping of cough at minor concentration of Used this oil and also consideration this having sharp effect at this stage if we have suffering from dry and non-dry cough means productive and non-productive types of cough . Antitussive, expectorant and antispasmodic actions are considered to be the major pharmacological properties of thyme. Thymol possesses anthelmintic (especially hookworms), antibacterial and antifungal properties. Thymol and thyme oil have antibacterial activity against certain organisms and thymol, carvacrol and thyme oil have antifungal activity against a range of organisms.

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