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## **The effect of thymus vulgaris extract on the rate of calcium oxalate inhibition in vitro**

### **Abstract**

We all hear about kidney stones but, actually what are kidney stones? Kidney stones are hard deposits made of minerals and salts that form inside your kidneys. On 11 September, the Chinese central government and Ministry of Health informed that several thousands of Chinese had been diagnosed with kidney stones. About 54 000 citizens have been examined, 13 000 of them are in hospitals and four deaths have been reported so far. kidney stones are formed due to dehydration, changes in the diet, hormonal changes, and infections in kidney. They present with renal pain, blood in urine, pus in urine, and fever. If the concentration of the kidney stones increased, it leads to affecting the function of the kidney and other parts of the human body. If the concentration of the kidney stones increased, it leads to affecting the function of the kidney and other parts of the human body and sometimes leads to death. As the kidney stones are a real and series problem, several treatments were developed and found. As examples for these treatments: medication, lithotripsy, tunnel surgery, ureteroscopy and more. They all have common disadvantages as high cost, unsafety and feeling lot of pain. We made a solution that is an depends on an extraction from natural plant which is thymus vulgaris that is used to fragment the kidney stones. That is an efficient, safe and economical solution.

### **Key Words**

[Kidney stone, Thymus vulgaris, Inhibition, Fragmentation]

### **Brief Background**

Brief Background Thyme has been used medicinally for thousands of years. Beyond its common culinary application, it has been recommended for a myriad of indications, based upon proposed antimicrobial, antitussive, spasmolytic and antioxidant activity. To date there are no well-defined controlled clinical trials to support thyme monotherapy for therapeutic use in humans. Thymol, one of the constituents of thyme, is contained in antiseptic mouthwashes, with limited clinical studies in the available literature to corroborate its efficacy as a monotherapy in dental outcomes, such as reductions in plaque formation, gingivitis and caries. Although no well-defined clinical data exist, traditional health practice patterns, expert opinion, and anecdote suggest that the herb is generally well tolerated in common doses; the majority of adverse events appear to be related to dermatologic or allergic reactions. The essential oil of thyme should not be used orally since it has been associated with toxic reactions ranging from nausea to respiratory arrest. kidney stones (renal lithiasis, nephrolithiasis) are hard deposits made of minerals and salts that form inside your kidneys, Kidney stones have many causes and can affect any part of your urinary tract from your kidneys to your bladder. Often, stones form when the urine becomes concentrated, allowing minerals to crystallize and stick together. Kidney stones occasionally cause kidney failure. Stones that are large in size, cause blockages or infection, and stones that recur frequently are all more likely to cause developing this very serious complication and this kidney failure may lead to death in some specific conditions. The existence of kidney stones was first recorded thousands of years ago, and lithotomy for the removal of stones is one of the earliest known surgical procedures. In 1901, a stone discovered in the pelvis of an ancient Egyptian mummy was dated to 4,800 BC. Medical texts from ancient Mesopotamia, India, China, Persia, Greece, and Rome all mentioned calculous disease. Part of the Hippocratic Oath suggests there were practicing surgeons in ancient Greece to whom physicians were to defer for

lithotomies. The Roman medical treatise *De Medicina* by Aulus Cornelius Celsus contained a description of lithotomy, and this work served as the basis for this procedure until the 18th century the solution of Fragmenting kidney stone.

### **Expert Opinion and Folkloric Precedent**

Thyme leaf is renowned for being a culinary spice and has also been used cosmetically and medicinally. Traditional uses of thyme include for coughs and upper respiratory congestion; it continues to be one of the most commonly recommended herbs in Europe for these indications. The German expert panel, the Commission E, has approved thyme for symptoms of bronchitis, whooping cough, and catarrh (inflammation of upper respiratory tract mucous membranes). Topically, thymol (a major constituent of thyme), has been used for various bacterial infections. Recent studies of combination products including thymol, such as Listerine®, have shown antibacterial activity when used as a mouthwash to reduce oral bacteria. Monograph from Natural Standard 51 Experts have recommended the use of thymol in treatment of actinomycosis, onycholysis (separation or loosening of a fingernail or toenail from its nail bed), and paronychia (inflammation of the tissue surrounding a fingernail or toenail) due to its antifungal properties. Anecdotal reports of successful healing date to the 1960s,<sup>3</sup> although there are no well-designed clinical studies to advise for human therapeutic use.

### **Interactions**

#### **Thyme/Drug Interactions**

Thyroid Replacement Therapy, Anti-Thyroid Agents: An extract of *Thymus serpyllum*, a related species to *Thymus vulgaris*, has been shown to exert anti-thyrotropic effects in rats, causing decline in thyroid stimulating hormone and prolactin.<sup>18</sup> Therefore, in theory, thyme may decrease levels of thyroid hormone, although this has not been systematically studied

or demonstrated in humans. Estrogen, Progesterone: Thyme has demonstrated estradiol and progesterone receptor-binding activity in vivo, 19 although this has not been systematically studied or demonstrated in humans. 5-fluorouracil (Topical): Topical thymol significantly enhanced percutaneous absorption of 5-fluorouracil through porcine epidermis compared to control.<sup>21</sup>

### **Thyme/Herb/Supplement Interactions**

Herbs with Estrogen or Progesterone Receptor Activity: Thyme has demonstrated estradiol and progesterone receptor-binding activity in vivo, 19 although this has not been systematically studied or demonstrated in humans.

### **Thyme/Food Interactions**

Insufficient available evidence.

### **Thyme/Lab Interactions**

Thyroid Stimulating Hormone (TSH): TSH levels have been suppressed by administration of thyme extract in rats.<sup>18</sup> Effects in humans are unknown.

Thyroid Hormones (T3, T4): Thyroid hormone levels have been reported to decrease after single intravenous injections of thyme extract in rats.<sup>18</sup>

Prolactin: Based on pre-clinical data, prolactin levels theoretically may be decreased at high thyme doses.<sup>18</sup>

## **History**

Thyme has been used historically for cosmetic, culinary and medicinal purposes. Ancient Sumerian and Egyptian cultures employed thyme for medicinal purposes and to embalm the dead. Romans burnt thyme to deter dangerous animals, and used thyme to flavor cheese and alcoholic beverages. Roman soldiers bathed in thyme, as this was believed to provide vigor.





Thyme's common name may be derived from a Greek word meaning to fumigate, based on its use as incense, or may come from the Greek word thymon, meaning courage. In Medieval times, women sometimes embroidered a sprig of thyme on gifts for knights. In modern times, thyme oil is commonly used in manufacturing as a constituent of soaps, cosmetics, mouthwash and toothpaste. Red thyme oil is used in perfumes.

### **Discussion**

*T. vulgaris* L. (garden thyme). and *T. comosus* Heuff. belong to Lamiaceae family. In Romania, *Thymus* genus contains one cultivated species and 18 wild species. *Thymus vulgaris* L. is only species cultivated as aromatic plant and *Thymus comosus* Heuff. is one of the most important spontaneous species. The constituents of these species are: volatile oil with a variable content (thymol, methylchavicol, cineol, borneol), flavonoids, phenyl-propane derivatives, tannins. The thyme volatile oil is strongly antiseptic, the main constituent – the thymol, in particular, is a most effective antifungal. The oil is also an expectorant, it expels worms and have tonic effect, supporting the body's normal function and countering the effects of aging. Thymol, methylchavicol and flavonoids relieve muscle spasms.1–6

## Materials

Table 1

Name	Image	Name	Image
Thymus vulgaris (15 L.E)		Distilled water (0 L.E)	
Sodium chloride (0 L.E)		Kidney stone (0 L.E)	

## Procedures:

There are four steps for our projects that helps fragmenting the kidney stone

1. First of all, preparing for the thymus vulgaris solution: adding 1 liter of distilled water of temperature between 49C to 50C to 9 grams of sodium chloride. After that, take 100 milliliter of the water and add it to 9 grams of thymus. Then mixing them in the mixture and leave them for 24 hours. The coming step is to filtrate them and then put them in the refrigerator.
2. get the kidney stone and analyze it to know the type of the stone
3. putting the kidney stone into the extract of thymus by 60 ml of thymus and 2ml of ethyl alcohol.
4. observing and measuring the mass of the kidney stone in (Ib) every 24 hours for 5 days to know the rate of fragmenting.

## Results:

The test of our project was of putting the kidney stone in the extraction and observing its rate of change in its mass for 5 days every 24 hours. The kidney stone was at first 1.36 grams.

Day treatment	Mean percent of inhibition $\pm$ SD
Second day	1.031, $\pm$ 0.01
Third day	1.039, $\pm$ 0.02
Fourth day	1.048, $\pm$ 0.01
Fifth day	1.057, $\pm$ 0.01

Second day	1.30
Third day	1.255
Fourth day	1.20
Fifth day	1.14

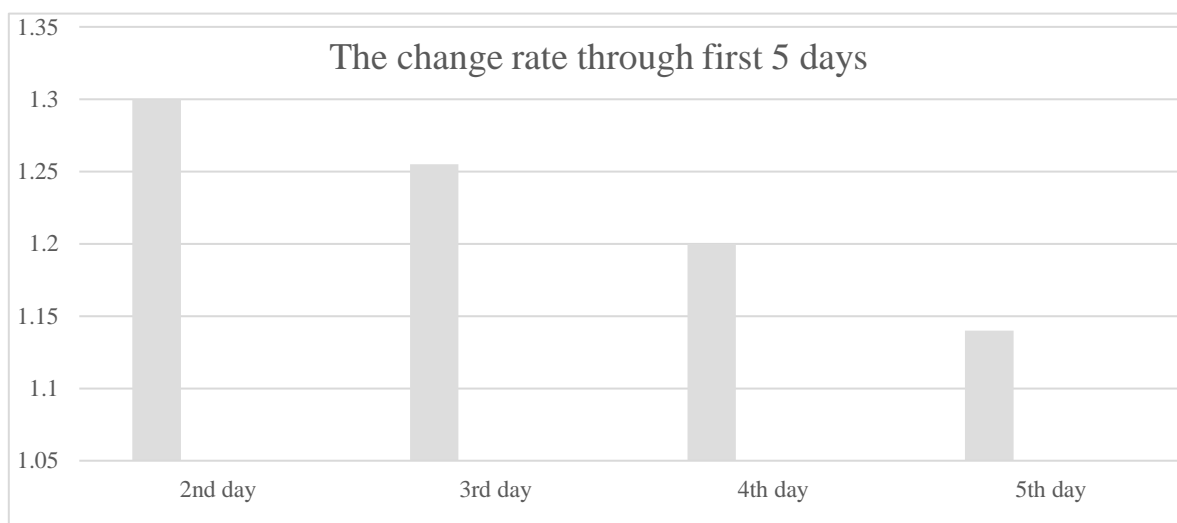


Fig.1. The change rate through first 5 days

## Applications:

This research is very important to the public health by this extraction we can save a lot of money, effort furthermore the pain that the patient feels, by this extraction after a few weeks the kidney stones will be fragmented completely. As an application for this extraction, we can manufacture it in the form of medication capsules. These capsules also are safe and contain phytochemicals that inhibit stone formation.

## **Conclusion:**

Our project aims to solve the problem of the public health. The project works on the fragmenting of the kidney stones. The project is an efficient solution, economical that is low in cost and natural friendly to the human that don't have side effects on the health of human. Additionally, it is painless way to get rid of kidney stones.

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