

An Investigation of Thyme Effect on Helicobacter Pylori

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Abstract: The consumption of thyme plant in Iranian societies long ago and with respect to its widespread attention around the world and the effect of it on enteric system, we decide to study antibacterial effects of helicobacter pylori, as one of the main causes of gastric ulcer. For achieving our goal, we used a trade manufacturing syrup named "Gastrolic". For determining sensibility content to various antibiotics, a set of different standard microbial type was prepared first and then bacteria moved to the mentioned medium (environment), in addition to using another medium as a witness, which is being set in standard laboratorial circumstances. After passing 24 h, we investigate the culture to find presence of any sensible non-sensible or resistant aureole. By constructing a table, we studied and set resistance of various microbes in culture and determined type of antibiotics. The results show the most sensibility for salmonella and least for klebsiella. After doing the above mentioned study, results indicate that thyme plant has a partial or complete anti-flatuuous, anti-phlegmasia effect, in addition to regulating digestion system, as well as anti bacterial effect on the main factor of gastric ulcer, helicobacter pylori and other illness producing bacteria.

Key words: Thyme % Helicobacter pylori % gastric ulcer

INTRODUCTION

Thyme is one of the Sanatory plants, which work wonders in curing processes now and then. So it should be considered among the most precious plants around the world [1].

Thyme is enemy of poison. It is anti spasm and pain. It eases flood blowing and invokes sexual activities and promotes consciousness and intelligence as well. It is useful for liver disorder.

Meanwhile, it is used in pulmonary infections, catarrh, bronchitis, angina, indigestion, stomach sore and inflation [1].

It is eatable for remedy of whooping cough and other types of coughs and diarrhea or digestive disorders [2].

It is consumed externally for healing of wounds and has superior effect in this regard and notably is antiseptic and appetizing. It changes intestinal flora.

As regard to the above mentioned characteristics [2, 3] we decide to study its antibacterial effects on salmonella, shigella, ecoli, celebsiela, aerase staph, helicobacter pylori.

MATERIALS AND METHODS

For executing this phase, we use of thyme products named "Gastrolic drop". Thymol, which is extracted from it, owns about 4.1 mg of the extracted substance in each ml.

For measuring partial sensibility with various antibiotics, at first standard microbial type of salmonella, shigella, ecoli, aerase staph, was prepared by Microbiological dept. of the Paramedical University.

For doing various stages of antibiograph, after preparing jetdiffusion and molerhinton and by using Macfarlane half dark method, a sensibility test was conducted and then antibiotic discs like ciproflaxazine (CP) and cephalaxine (CF) as witness antibiotics sensible on salmonella, shigella, ecoli, pathogen and ampicillin as resistant witness and cotrimoxazole (SXT) discs as semi-sensitive witness were used.

About sensibility test on the above mentioned bacteria by thyme plant, after culturing them a cavity of 4mm dimension was separated from molerhinton environment and 2 drops of thyme-extracted juice having thymol replaced instead and then put in the 37°C

Table 1: The results were investigated regarding existence of sensitive, semi-sensitive and resistant aureole

| Drug | Bactria | | | | | | |
|-------|----------|------------|----------|--------------|------------|---------------------|---------------------|
| | Yersinia | Salmonella | Shigella | Aerous staph | Celebsiela | Ecoli Entropathogen | Helicobacter pylori |
| Thyme | S | S | I | S | S | I | S |
| CF | R | I | I | R | R | R | S |
| CP | S | S | S | S | I | R | S |
| SXT | I | S | S | I | R | R | R |
| GM | I | S | S | S | I | S | I |
| AM | R | R | R | R | R | R | R |

S = Sensitive R = Resistance I = Intermediate

Table 2: Inhibition of *Helicobacter pylori* by various plant extracts

| Plant extract type | Inhibition zone (in mm) | |
|--------------------|-------------------------|-----------------|
| | Water extract | Alcohol extract |
| Majorane | 22 | 18 |
| Inula | 5 | 12 |
| Rosemary | 10 | 8 |
| Licorice | 11 | 14 |
| Camomille | 5 | 5 |
| Cinnamon | 9 | 47 |
| Laurel | 8 | 8 |
| Melissa | 18 | 14 |
| Thyme | 24 | 19 |
| Sage | 10 | 9 |
| Garlic | 5 | 7 |

incubator for 24 h and finally the results were investigated regarding existence of sensitive, semi-sensitive and resistant aureole, which is shown in Table 1.

RESULTS

In European Patent Application No. 93.401638.7 it was described a pharmaceutical composition containing an aqueous or organic extract of the plant Thyme for the same purpose. It was surprisingly found according to the present invention, that only an organic extract of Cinnamon, is useful for preventing the growth of *H.pylori* bacteria in addition to the cinnamaldehyde and cinnamaldehyde which are the main constituents of the Cinnamon plant.

In the following Table 2, there are summarized the results of inhibition of said bacteria by some plants [4].

DISCUSSION

Thyme, which is consumed, as a traditional custom of Iranian societies, especially in winter with turnip, has

appropriate aroma and sufficient benefits. Volatile essence of it, consisted of thymol, grant a pleasant odor to the plant and so make it to be used by public.

There are many useful effects like anti inflammation and calmativ of spasmodic cough effects, which are previously reported, in addition to other remedial effects like

Whooping cough and various coughs as well as digestive discomforts.

In the present study anti microbial effects of thyme are investigated with respect to other antibiotics.

The thyme, in addition to anti flatulent and anti inflammation effects and adjusting digestive system, has another complete, sensitive and semi-sensitive effects on the main cause of gastric ulcer, helicobacter pylori, as well as other bacteria like salmonella, shigella, aerouse staph and pathogenic ecoli.

The antimicrobial activity of thymol, carvacrol, cinnamaldehyde and eugenol alone or combined was tested by micro methods on eight oral bacteria. The compounds showed an inhibitory activity on seven microorganisms and a synergistic effect was observed with certain combinations. The four compounds can be used alone or combined, as eugenol and thymol, eugenol and carvacrol, thymol and carvacrol, during the treatment of oral infectious diseases [5].

An incomplete anoxic fermentation of livestock waste results in offensive odor emissions. Antimicrobial additives may be useful in controlling odor emissions and pathogens. Natural antimicrobial compounds, carvacrol or thymol at 16.75 mM (2.5 g lG¹) completely inhibited the production of the offensive odor compounds, isobutyrate, valerate, isovalerate and cresol and significantly reduced other short-chain volatile fatty acids and gas emissions from swine waste. Fecal coliforms were reduced from 6.3×10 [6] to 1.0×10 [7] cells per ml 2 days after treatment with carvacrol (13.3 mM) and were not detectable within

14 days. Total culturable anaerobic bacteria were reduced from 12.4×10^{10} [10] to 7.2×10^1 [1] cells per ml after 2 days and were suppressed below this level for 28 days. Lactate production was not prevalent in untreated swine waste indicating that the microbial populations differ from those in cattle waste. Carvacrol and thymol were stable in swine waste under anoxic conditions for 62 days with 90 to 95% of the additive being recovered in the waste solids. In conclusion, carvacrol and thymol are not metabolized in anoxic swine waste and they are potentially useful in controlling odor emissions and pathogens in swine waste [8].

Wastes generated from the production of cattle and swine in confined facilities create the potential for surface and groundwater pollution, emission of greenhouse gases, transmission of pathogens to food and water sources and odor. It is our hypothesis that something, which inhibits microbial fermentation in livestock wastes, will be beneficial to solving some of the environmental problems. Our work has concentrated on the use of antimicrobial plant oils, thymol, thyme oil, carvacrol, eugenol and clove oil. Anaerobic one-liter flasks with a working volume of 0.5 L cattle or swine manure were used to evaluate the effect of thymol and eugenol on production of fermentation gas, short-chain volatile fatty acids, lactate and bacterial populations. Either oil at 0.2% in both wastes essentially stopped all production of gas and volatile fatty acids and eliminated all fecal coliform bacteria. In cattle but not swine waste, thymol prevented the accumulation of lactate. However, eugenol stimulated lactate formation in cattle and swine wastes. Thus, eugenol may offer a distinct advantage over thymol, because lactate accumulation in the wastes causes the pH to drop more rapidly, further inhibiting microbial activity and nutrient emissions. We conclude that plant oils may offer solutions to controlling various environmental problems associated with livestock wastes, assuming that they are cost-effective [9].

Extracts of several plants were tested for inhibitory activity against *Helicobacter pylori*. Among these plants thyme (aqueous extract) and cinnamon (alcoholic extract) were the most effective. Since aqueous extract of thyme is easier to produce and consume, it was further investigated. Compared with several antibacterials, the thyme extract had a significant inhibitory effect on *H. pylori*, reducing both its growth and potent urease activity. From the results of this study, the aqueous extract of thyme possesses a therapeutic potential which merits validation by clinical studies [10].

The invention relates to the use of either an aqueous extract or an organic extract of the plant *Thymus* to prepare a pharmaceutical composition useful to inhibit the growth of *Helicobacter pylori* and the urease activity of *Helicobacter pylori*. In case of an aqueous extract, a minimum amount of 0.5 mg of the dry plant in the extract is required but the preferred amounts are above 1.2 mg. The aqueous extract may be used either as a drink, with or without additional ingredients, or transformed into a capsule or a paste. The invention also relates to in-vitro methods for inhibiting the growth of the urease activity of *Helicobacter pylori* [11].

Of interest, extracts of a variety of plants, such as garlic, thyme and East African herbal plants, inhibit the growth of *H. pylori* in the test tube [7, 12]. Whether such extracts will prove useful in the treatment of infected patients remains to be demonstrated. Thyme honey, with its low pH and high osmolarity, is most effective in eliminating *in vitro* *Helicobacter pylori* [13].

Side effects: Used as indicated above, thyme herbal preparations are generally safe. However, a spasmodic cough, particularly in a young child, may be dangerous and a healthcare professional should be consulted before deciding on the proper course of treatment. The use of thyme by pregnant or breast-feeding women is considered to be safe. Thyme oil should be reserved for topical use, as internally it may lead to dizziness, vomiting and breathing difficulties [6]. Some people may be sensitive to use of thyme oil topically on the skin or as a mouth rinse.

CONCLUSIONS

With respect to investigation of achieved outcomes, *Helicobacter pylori* is also sensible to thyme and might be used as a chosen drug.

MIC content of thyme need to be investigated more by tube delution method.

In addition, anti microbial character of thyme would exterminate aerouse staph and since this bacteria is a cause of food poisoning, we are able to produce protective layer to be dispersed on food stuff in order to prevent growth of aerouse staph.

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