

A study to find thyme oil dose that kill 50% of mice and minimal dose that kill all mice and maximum non-lethal dose

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Abstract: Thyme plant is one of the natural plants that have Aromatic Perfumes liked by human being, and one of the natural resources that sought by lot of researchers and scientists to use it in scientific research and studies of perfumes and pharmaceuticals and used as flavour in making a lot of industrial products. Components of thyme oil sold as a spice in the Libyan market extracted by steam distillation, the ratio of aromatic volatile of thyme oil was 2.548% and specific gravity up to 0.9609, while the optical refractive index 1.5111 where thyme oil extracted will be used as input in some food products for human consumption, the study required conduct some laboratory experiments with respect to toxicity to find the dose that kills 50% of the experimental animals, and then to prove that it has no damage when used repeatedly, in this study, the dose that kills 50% of mice and minimal dose lethal to all mice and maximum non-lethal dose was reached, the use of Libyan volatile thyme oil because of its great and direct relationship, especially its use in the manufacture of soft drinks, we are confident now that the use of 0.1 ml of thyme oil to prepare 1 liter of soft drink for human consumption is safe even if used repeatedly by man every day, and the dose reached was 3.84 mg, which killed 50% of mice, weighing 25 grams. This experiment was conducted at faculty of Medicine in Libya.

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1. Introduction

Thyme is Herbaceous plant of the platoon species, grows in mountainous areas, used as a beverage instead of or with tea, added to some food to give it an acceptable flavor, the plant is used in folk medicine frequently where it is prescribed to treat mouth infections, stomach, intestine and airways, coughing and gastroenteritis and expel intestinal worms, as well as to strengthen the heart¹. Thyme oil can be separated easily from the plant, and this oil contains phenolic substances such as thymol, as well as carfirkrol substance and impurities such as resins, in addition to the substances listed, the plant contains tannin and many other materials¹.

Experiments have shown that thyme has an antibacterial effect² has loosening effect on stomach muscles³⁻⁴, trachea⁴, strengthening the heart⁵, lowers blood pressure and analgesic⁶, lowering blood cholesterol⁷, anti-oxidant⁸, and is useful for the treatment of certain skin diseases⁹ it was found that the muscles loosening substances in thyme is a flavonoid³.

Experiments conducted on laboratory rabbits using aromatic oils extracted from some plant species have proved that 1 mg / kg of solution at a concentration 0.5 -5% is safe and led to heart activation and lower blood pressure¹⁰.

As the thyme oil has an acceptable taste, it can be added to soft drinks, and although thyme is

used frequently as a beverage, yet, it is necessary to conduct some experiments to find the dose of thyme oil added to the drinks, which kills 50% of the experimental animals, and then to prove that it has no damage when frequently used.

Experiment:

In the initial study, the simplified method was used¹¹, where 2 mice were taken (weighing between 22 to 25 grams) that is for each group, were injected with a volume of solution of 0.1 ml per mouse, exponentially concentrations of dilutions in the Peritoneal cavity to reach the dose that kills all the rats and emphasize a higher dose, then immediately mice were observed in terms of behavior and return to normal state when placed on its back and the presence of any thrills or shakes and breathing for a period of 5 hours then every hour for 12 hours and then at 16 hours and then at 24 hours and registration of death if occurred from doses given, the dose that killed 50% of the mice and a dose lower than the dose larger ones were selected and give these doses into three groups of mice each composed of a number 8 mice, and thus determine the dose that kills 50% of the mice in a group larger in number than the previous.

Since the thyme oil does not dissolve well in water, a drop of TWEEN 80 was added to 1 ml of solution Which is non-toxic and has no effect of any

kind, knowing that thyme oil was tested by dissolving in alcohol and water is added to dilute, but found that ethanol at the added concentrations to a solution of the oil in itself has a detrimental effect on mice and it was replaced with TWEEN 80 .

Summary of Results:

- 1- Solution diluted 5 times: lead to loss of coordination and consciousness in less than 15 minutes and death before 5 hours.
- 2- Solution diluted 10 times: lead to poor movement before half an hour followed by head falling on both sides during walking then death before 8 hours.
- 3- Solution diluted 20 times: lead to poor movement and death before 9 hours, when repeated with 8 mice, all died before 16 hours, this was the minimal concentration killed all mice.
- 4- Solution diluted 30 times: walking was somehow abnormal; no death at 24 hours or even after a week, the experiment was repeated with 8 mice, this was the maximal concentration tolerated by mice with no death.
- 5- Solution diluted 25 times: this experiment was made with 8 mice, 4 of which died before 16 hours and 4 remained alive even after 24 hours and even at one week, this was the dose that killed 50% of mice.

Summary: from this experiment it turned out:

- 1- The least lethal dose is the solution diluted 20 times.
- 2- Dose that kill 50% of mice is the solution diluted 25 times.
- 3- Maximum non-lethal dose is the solution diluted 30 times.

As oil density was 961 g/l this means that 1000 ml of oil contains 961g, if the solution diluted 25 times, then 25000 ml contains 96100 mg
i.e. 25 ml contains 961 mg
if 0.1 ml contains 961 X 0.1/25 = 3.84 mg
this is the dose that killed 50% of mice weighing 25 g

Therefore : dose for every 1g is 3.84
 $X1000/25 = 153.6\text{mg/kg}$

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