

# Effectiveness of Coat Button Plants in Eliminating Foot Odor

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## 1. Introduction

Body odor has always been displeasing and a bother, yet is a common problem for everyone, particularly during their teenage years. Body odor may be hard to avoid as it is caused by hormones that appear especially during puberty. People tend to avoid others who give off a foul odor, hence making people find lots of ways to prevent the emergence of odor from their body. One of the most common parts of the body where odor emerges is on the feet.

Oftentimes, body odor appears when sweat is produced. In feet sweat, bacteria, such as *Bacillus subtilis*, can be found as it digests and produce foul-smelling gas. Eliminating the bacteria that produces the acid would eliminate body odor. Hence, the use of antibacterial agent may solve this.

Nowadays, many natural resources such as plant extracts are often used for antibacterial agents. Coat button plants (*Tridax procumbens*) are wild plants that grow abundantly, yet it is often used for medicinal purposes, meaning that it has lots of useful substances in it. Therefore, coat button plants may be a candidate for the elimination of bacteria that cause of foot odor.

According to the problem stated above, a research has been started with the title “The Effectiveness of Coat Button Plants (*Tridax procumbens*) as an Antibacterial Agent towards Bacteria Found on Feet (*Bacillus subtilis* and *Staphylococcus spp.*)”. Through this research, another usage of wild plants is proposed for antibacterial purposes.

## 2. Problem Statement and Purpose

Foot odor is a problem faced by lots of people and is often sought to be eliminated. Coat button plants are also abundant and not much used. Hence a solution is needed in order to solve the foul-smelling odor and the abundance of wild plants.

The purpose of this research is as stated below.

1. Study antibacterial activity of coat button plants extract towards bacteria *Bacillus subtilis*
2. Identify bacteria found on the feet
3. Determine whether the extract may work on other bacteria on feet

## 3. Research Methodology

The antibacterial test data was obtained quantitatively through pour plate method and agar disk diffusion method. The bacteria identification was done qualitatively through observations and tests.

Coat button plant extract was obtained by using all parts of the plant through soxhlet with ethanol. Different concentrations of the extract (25%, 50%, 75%, 100%) were then made.

Antibacterial test was then done on *Bacillus subtilis*. The test was done with pour plate method by agar disk diffusion. Clear zones that appeared were then measured. Part of the clear zone was then inoculated to determine bacteriostatic or bactericidal antibacterial agent.

Bacteria sample was taken from feet and inoculated in nutrient broth. Bacteria were then grown on agar plate to form colonies. Bacteria were identified by gross colony, agar slant, gram staining, and catalase test. Each colony was then inoculated.

Antibacterial test was done on each colony through spread plate with agar disk diffusion method. Clear zones were then measured and analyzed.

#### 4. Result and Analysis

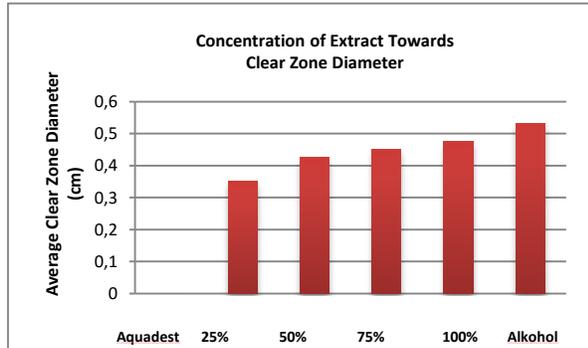


Fig 1. The average clear zone diameter of each concentration and control of antibacterial test on *Bacillus subtilis*

Clear zones formed surrounding all the extracts, proving that the extract does have antibacterial activities. Among the extracts, the 100% concentration had the largest clear zone. A trend was seen that the higher the concentration, the larger the clear zone, though the difference is not significant, indicating that antibacterial activity only differs slightly. Yet the extracts were still below alcohol meaning that it did not reach lethal doses.

Swab taken from the clear zone was found to be able to grow again, meaning extract works as bacteriostatic antibacterial agent.

Based on its components, coat button plant extract may work as it messes up protein, alters the outer membrane, inhibit enzyme activity, permeability of cell membrane, and synthesis of bacteria cell.

Through identification, the bacteria taken from the feet formed colonies and can be classified as *Staphylococcus* that are also known to be found in feet.

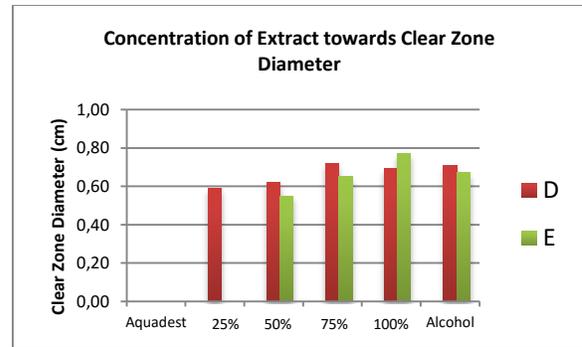


Fig 2. The clear zone diameter of each concentration and control of antibacterial test on *Staphylococcus D and E*

The extract only worked on 2 types of *Staphylococcus* found and yet not with a clear trend of clear zone diameter result. This shows that the extract does not work on all types of bacteria and that it might be due to media that does not support maximum growth of all bacteria.

#### 5. Conclusion and Recommendation

Based on our research titled "The Effectiveness of Coat Button Plants (*Tridax procumbens*) as an Antibacterial Agent towards Bacteria Found on Feet (*Bacillus subtilis* and *Staphylococcus spp.*)" a few conclusions were withdrawn as follows.

1. *Tridax procumbens* extract can work as a bacteriostatic agent towards bacteria *Bacillus subtilis*, with the 100% concentration as the most effective
2. *Staphylococcus spp.* Can also be found on the feet.
3. Coat button plant extract can work as an antibacterial agent towards several types (not all) of bacteria found on feet

As this research was done within a limited amount of time and facility, hence we recommend a few suggestions for the next researchers studying this topic.

1. Use statistics on clear zone results
2. Redo antibacterial test with repetition