



**THE STUDY OF THE ANTIMICROBIAL PROPERTY OF FIXED OIL FROM THE
DIFFERENT SPECIES OF CUCURBITACEAE FAMILY**

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ABSTRACT

This research presents the results of which among the three species of Cucurbitaceae Family namely Squash (*Cucurbita maxima*), Luff (*Luffa acutangula*), and Cucumber (*Cucumis sativus*) exhibit antimicrobial property. There are different tests conducted like the physical test, determining the color, odor and appearance of the three plant sample oil. The solubility test using 0.5 ml of the following solvents: water, alcohol, ether, chloroform, and acetone. Squash (*Cucurbita maxima*) is highly immiscible in all solvents used. Cucumber (*Cucumis sativus*), two of the solvents used is miscible with ether and chloroform while immiscible with distilled water, 95% ethanol and acetone while Luff (*Luffa acutangula*) is immiscible with the distilled water, 95% ethanol, ether and miscible with chloroform and acetone. Percentage yield was also determined, percentage yield of the extracted fixed oils of Luff (*Luffa acutangula*) was 46.93%, Squash (*Cucurbita maxima*) 35.80% and Cucumber (*Cucumis sativus*) 31.36%. With the stain test, all of the oil from the seed of squash, cucumber and Luff give permanent stain on the paper. The result obtained in specific gravity of the Fixed oils from luffa was 0.67, Cucumber 0.67 and Squash 0.69. Three concentrations of the fixed oil extract (250mg/ml, 500mg/ml, and 1000mg/ml) were used in this study to conduct the microbial assay of the fixed oil extract. The collected concentrations of the fixed oil extract were used for the anti-microbial property assay against *staphylococcus aureus* for gram positive bacteria, *Escherichia coli* for gram negative bacteria and *candida albicans* for fungi. Agar well diffusion method was used in this study using 45 plates for the microbial assay of the fixed oil. The researchers used ciprofloxacin as the positive and negative control for gram positive and gram negative bacteria, and fluconazole as the positive control for fungi. Sterile water was used as the negative control in this study. Based on the result of the study, the researchers concluded that the extracted fixed oil from the seeds of cucumber, squash and Luff did not exhibit any antimicrobial property.

KEYWORD: Cucurbitaceae Family, Antimicrobials, Fixed oil, seeds oil.

INTRODUCTION

Plants, especially medicinal plants, offer vast resources of natural compounds with biological activities. Many medicinal plants have been screened extensively for their antimicrobial potential worldwide. (Kaur & Arora, 2009). According to World Health Organization (P.R.V. Santos., et al., 1995) medicinal plants would be the best source to obtain a variety of drugs.

The *Cucurbitaceae* family, or the gourd family, is said to have a variety of economically useful food plants such as Cucumber, Melon, and Watermelon. It provides a lot of functions to humans and animals.

Luffa (*Luffa acutangula*), or ridged gourd, is primarily used as a vegetable, but can also be used as a sponge when its fiber is dried. However, the plant is grown

rarely because of its spongy characteristics. The oil from the seeds is used in soap manufacture, it is credited for its emollient and anthelmintic properties. It is also used as emetic and cathartic, as well as for treating skin problems.

Squash (*Cucurbita maxima* Duchesne), or pumpkin, originated in the Americas, is said to possess high levels of vitamins and minerals, particularly the seeds.

Cucumber (*Cucumis sativus*), is a widely cultivated plant from the family Cucurbitaceae. It is said that Cucumbers have chemicals that possess preventive properties such as flavonoids, lignans and triterpenes, which have antioxidant, anti-inflammatory, and anti-cancer benefits. (livescience.com).

The researchers desired to attain the antimicrobial property of the fixed oils from the seeds of Luffa, Squash, and Cucumber using *Escherichia coli*, *Candida albicans* and *Staphylococcus aureus*. The important facts and information from the said plant samples lead the researchers to further explore the capability of the fixed seed oil extracted to have antimicrobial properties to the given bacteria above. Hence, this study could be one of the solutions to be an alternative inhibiting the proliferation of these bacteria in the human body leading to different diseases.

MATERIALS AND METHOD

1. Collection and preparation of the sample seeds.

The collected seeds underwent maceration. Each sample was placed in an Erlenmeyer flask by completely submerging the plant sample to the n-hexane for 48 hours. They were filtered through the use of muslin cloth. The extract was transferred into an Erlenmeyer flask and was subjected to rotary evaporator for 1-2 hours to the solvent. Then further evaporated in a water bath until pure sample is achieved.

Microbiological Assay for the Antimicrobial activity of Fixed Oil

About 20ml of specified agar in their specified labeled plate was in a smooth base layer of uniform depth. With the use of sterilized cork bore, the three holes were made in each petri dish with a sufficient distance to each other. The inoculum was streaked into the surface of the agar. The agar plates were filled with the assigned antimicrobial and the others were with oil extract with 250 mg/ml, 500 mg/ml and 1000 mg/ml concentrations. The plates were placed in room temperature at 32°C for 24 to 48 hours. The zone of inhibition was measured in millimeters and was recorded based on values.

RESULTS AND DISCUSSION

1. The Squash, Luff, and Cucumber seed fixed oil had a positive result for the physical test, the three seed oils are yellow in color, with peanut-like odor and turbid in appearance. For the solubility test, the extracted oil of Squash (*Cucurbita maxima*) is immiscible in all solvents used. The extracted oil from Luff (*Luffa acutangula*) was miscible in chloroform and acetone and immiscible in distilled water, 95% ethanol, and ether. The extracted oil from Cucumber (*Cucumis sativus*) is immiscible in distilled water, 95% ethanol, and acetone and miscible in n-hexane and chloroform. For the stain test, the three plant oils gave a permanent stain. The specific gravity of Squash is 0.69, Luff is 0.65, and Cucumber is 0.67. For the refractive index, The USP Specification for Squash is 1.466-1.469 and the actual reading is 1.467, for the Luff, the USP Specification is 1.470 and the actual reading is 1.469, and for the Cucumber, the USP Specification is 1.470-1.480, and the actual reading is 1.470. For the result of acid value, Squash exhibited 3.7026, Luff, 4.8246, and Cucumber, 5.3856.

2. The Squash, Luff and Cucumber seed fixed oil did not exhibit an antimicrobial activity at 250 mg/mL, 500 mg/mL, and 1000mg/ml.

CONCLUSION

Based on the results of the study, the researchers concluded that the extracted fixed oils from the seeds of Cucumber (*Cucumis sativus*), Squash (*Cucurbita maxima*) and Luff (*Luffa acutangula*) did not exhibit any antimicrobial property.

RECOMMENDATIONS

1. To determine other therapeutic activity of plants.
2. To conduct other microbiological tests for antimicrobial property.
3. To make use of other constituent in the plant sample that exhibits a greater amount of yield and antimicrobial property.
4. To extract the fixed oils using other solvents aside from n-hexane and compare which among the used solvents will further purify the plant constituent.

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