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Antimicrobial Activity of Origanum Majorana Plant Extract against Bacterial Strains

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Abstract: ***The present study was done to find out the antimicrobial activity of Origanum majorana L plant. It is a medicinal plant used in various medicines. Keeping this in mind the antimicrobial analysis was done in three different mediums i.e ethanol, methanol and aqueous. The best result was observed in the methanol in both the organisms.***

Keywords: *Origanum majorana L*, Antimicrobial activity

1. Introduction

Microbial invasion create problems in the day to day life to all human beings specially to women during menstruation. Growth of bacteria can occur every twenty minutes under most favorable conditions multiplying every single bacterium into eight million bacteria within eight hours. . Humid and warm environment still aggravate the problem. Infestation by microbes cause cross infection by pathogens and development odour where the fabric is worn next to skin. In order to protect women from this poor pathogens and to reduce the cross infection, a special durable herbal antimicrobial finish on textiles has become a necessity. The use of herbal medicated textile products helps to reduce the contamination and infectious microbes. As textiles are known as the second skin, the use of natural antimicrobial agents helps to design functional textiles with no side effects. the staining and loss of the performance properties of textile substrates are the results of microbial attack. Basically, with a view to protect the wearer and the textile substrate itself antimicrobial finish is applied to textile materials. The Origanum majorana leaves were tested for antimicrobial activity. As it is a medicinal plant, used for treating many diseases.

2. Material and Methods

Collection of herbal plant: the leaves of Origanum majorana were collected from local area . The collected leaves were properly washed and then dried in shade at a temperature range of 38-40°c. the moisture content of the leaves collected was reduces to less than 14% with proper drying. The dried plant sources were grinded in the mixer grinder to make its fine powder. The extraction process was done in three stages i.e drying, grinding and extraction, three type of medium were prepared i.e. Aqueous, Methanol and ethanol for finding their microbial activity.

Aqueous Extraction procedure: 1 gm. plant source was mixed with 25 ml. of water kept for 24 hr. it was centrifuge for 30 min. then solution was filtered with the help of whattman paper the collected extract was stored in airtight bottle at 4° c in refrigerator for further experiments.

Ethanol and methanol extraction: 1 gm of the source powder was mixed thoroughly with 70 % methanol and ethanol kept in airtight conical flask. The conical flask was incubated for 24 hr. in the room temp. After 24 hr. the solution is centrifuge and filtered using whattman filter paper then kept in an airtight bottle at 4° c for further experiments.

Test organisms: two bacteria were used in this study one gram positive and one gram negative. Theses bacteria were obtained from the deptt. of Biotechnology, MPUAT, Udaipur.

Preparation of bacteria culture: Four to five colonies from pure growth of each test bacteria were transferred to 10 ml. of nutrient broth. The broth was incubated at 35- 37° c for 18-24 hr. the turbidity of the culture with 0.5 Mc forland Nephelometer standards to get 10^5 to 10^6 CFU/Ml.

Preparation of Agar Media: Nutrient Agar was prepared by adding 28 gm. Nutrient agar in one lt. of distill water and shake it till the powder completely dissolve in water. The prepared medium was autoclave at $121^{0\ c}$ for 15 min. the sterilized medium was kept into LFR and allow it to cool 40^0 -50^0 c pour the agar into sterilized Petri dish, and allow it to solidify. Dry the prepare plates at 30-37° c in an incubator with partly covered lid for 20-30 min. or until excess surface moisture were evaporated.

Analysis of Antimicrobial activity by disc diffusion method: the antimicrobial activity was quantitatively evaluated against staphylococcus aureus (ATCC 6538), a gram positive organism and Escherichia coli (ATCC 8739) gram negative organism. Both these were separately spread with the help of glass spreader.

The herbal treated sample in all the three herbal solvent were placed on the agar plate. The agar plate is incubated for 36-48 hr. at a temp. of 30 -37° c . After this zone inhibition was measured.

3. Result and Discussion

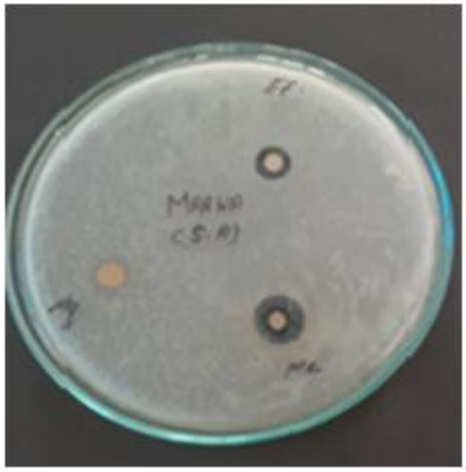

Plate 1

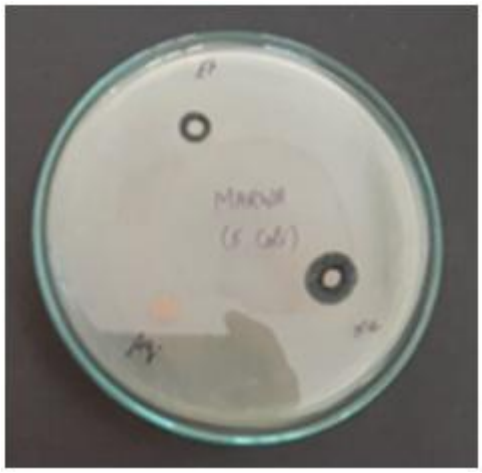

Plate 2

Plate 1 shows that there was a 5mm zone of inhibition developed in the methanol Origanum majorana extract, while 2mm was measured in ethanol medium and aqueous possess no affinity towards Origanum majorana antimicrobial property. Hence methanol gave the best result among all the three mediums against staphylococcus aureus (ATCC 6538), a gram positive organism.

Plate-2 shows that there was a 6mm zone of inhibition developed in the methanol Origanum majorana extract, while 2mm was measured in ethanol medium and aqueous possess no affinity towards Origanum majorana antimicrobial property. Hence methanol gave the best result among all the three mediums against Escherichia coli (ATCC 8739), gram negative organism.

4. Conclusion

Traditionally, marwa plant has been used as a folk remedy against asthma, indigestion, headaches and rheumatism it also helpful in easing sore muscles and swollen joints while stimulating peristaltic movement of the digestive system for poor apatite as well for menstrual cramps. The results of antimicrobial activity show that methanol was the best medium for both the organism i.e gram positive and gram negative. The maximum zone of inhibition was formed in the methanol medium than to ethanol and no zone was formed in the aqueous medium.

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