

Antibacterial and antifungal effects of plant extracts against the strains of pathogenic organisms

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ABSTRACT

Introduction: Current project was targeted the extraction and assay of antimicrobial drug resistance from the peels of lemon (*Citrus limonum*) and orange (*Citrus reticulata*). Strips were dried and against microbial metabolites were extricated. **Materials and Methods:** Extraction was finished by solvents such as ethanol, phenol, and (CH₃)₂CO. Test life forms were developed on reasonable culture media by “Spread plate strategy.” Concentrates were exposed to microbial defenselessness measure by “Agar well dispersion technique.” The MIC is identified and also by sequential weakening strategy. **Results and Discussion:** Every one of the concentrates of lemon and orange was observed to be viable against the utilized bacterial and contagious pathogens. Phenol, lemon, and orange extracts shown maximum zone of inhibition of nearly 15 mm in *Salmonella* sp. **Conclusion:** Isopropyl alcohol extract of lemon shown less inhibition zone in fungus *Penicillium gladioli*.

KEY WORDS: Acetone, Agar well diffusion method, Antimicrobial drug resistance, Ethanol, Minimum inhibitory concentration, Phenol, Serial dilution method, Spread plate technique

INTRODUCTION

Antimicrobial activity of plants plays a major role in research. The increase of disease is mainly based on pathogens and can be rectified using drugs and also by its resistance power. Most of the diseases are produced by organisms and again it can be solved using drugs produced by beneficial.^[3] The agar which is used to do the test should contain macronutrients and selective medium for particular drugs or organisms.^[1] Instead of using medicines, the secondary metabolites are highly useful in antibiotic sensitivity tests.^[2]

In recent days, fruits contain more antioxidant activity and it is widely used to cure many infections.^[4] The present work mainly concentrated to produce an antioxidant activity against certain microorganisms and also cost effective.^[5]

Materials Required

Preparation of crude extraction^[6]

- Solvents
 - Phenol
 - Acetone
 - Isopropyl alcohol.

Preparation of agar medium

- Nutrient agar
- Potato dextrose agar
- Autoclave
- Incubator
- Mueller-Hinton agar (susceptibility test and agar well diffusion method).

Preparation of broth medium

- Nutrient broth
- Potato dextrose broth
- Distilled water
- Autoclave
- Incubator.

Other needed materials

- Distilled water
- Beakers
- Incubator
- Petri plates
- Test tubes
- Cotton (absorbent and non-absorbent)
- Glass rod
- Conical flask
- Filter papers
- Micro tips
- Pipettes
- Surgical spirit or ethanol for cleaning working surface.

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MATERIALS AND METHODS

Sterilization

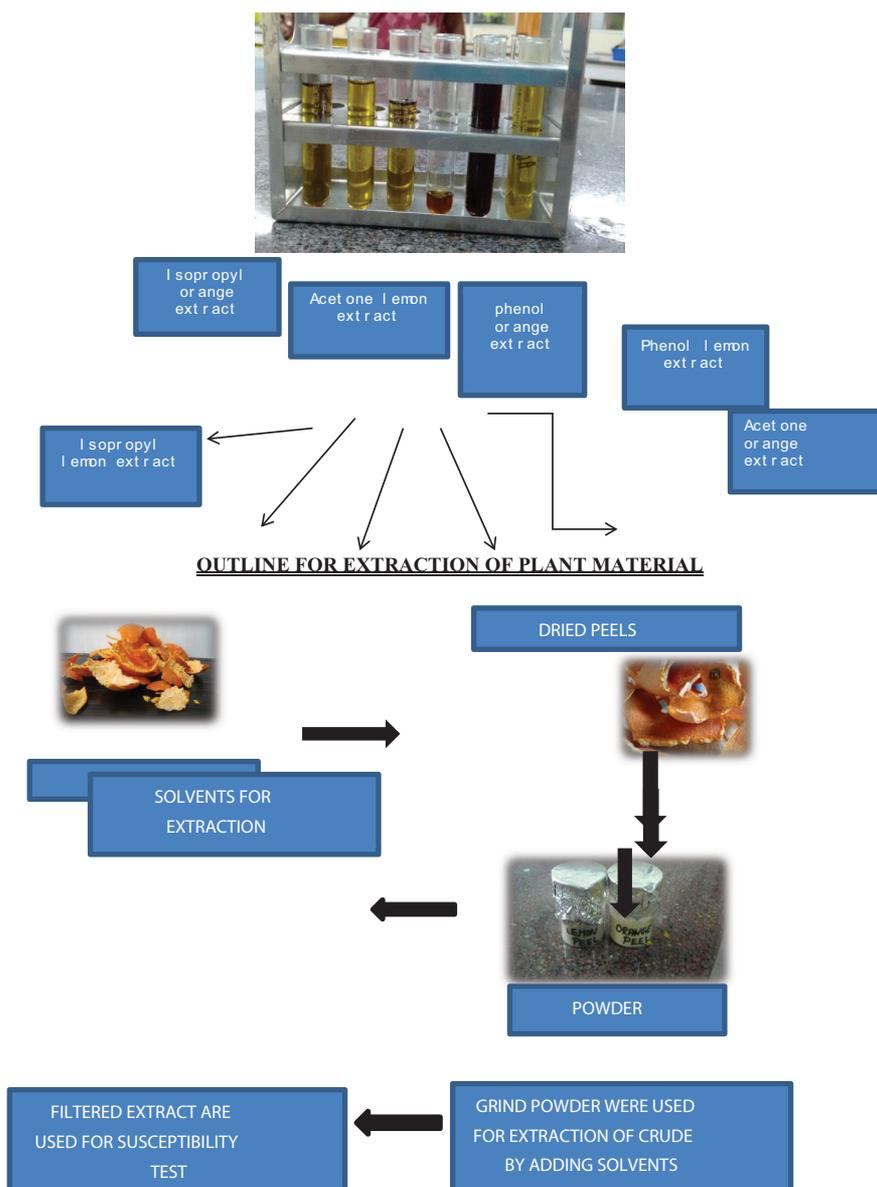
The sterilization is a term referring to any process that eliminates (removes) or kills (deactivates) all forms of life and other biological agents such as prions, as well as viruses which some do not consider to be alive. Sterilization is distinct from disinfection,

sanitization, and pasteurization in that sterilization kills, deactivates, or eliminates all forms of life and other biological agents.^[15] The aim of sterilization is the reduction of initially present microorganisms or other potential pathogens.^[7]

1. Wet method
2. Hot air oven
3. Operation.

Procedure

Preparation of antimicrobial and antifungal agents



Solvents Extract

Plant material	Solvent
Lemon peel	Isopropyl Acetone Phenol

RESULTS

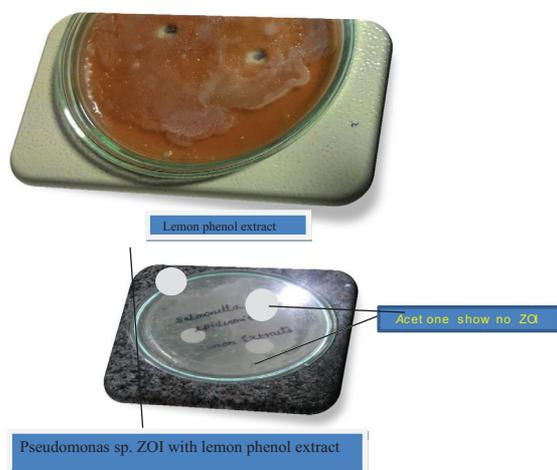
Lemon Extracts with Different Solvents^[8]

1. Antibacterial susceptibility assay of lemon (*Citrus limonum*) peels
Ethanol, acetone, and isopropyl alcohol extracts of lemon results are presented in the table below:

Microorganisms	Zone by phenol extract	Zone by acetone extract	Zone by isopropyl alcohol extract
<i>Salmonella epidermis</i>	15 mm	0	0
<i>Pseudomonas aeruginosa</i>	10 mm	0	9

2. Antifungal susceptibility assay of orange (*Citrus reticulata*) peels
Ethanol, acetone, and isopropyl alcohol extracts are presented in the table below:

Organisms	Zone formed in phenol extract	Zone formed in acetone extract	Zone formed in isopropyl alcohol
<i>Aspergillus niger</i>	0	0	0
<i>Aspergillus flavus</i>	0	0	0
<i>Penicillium gladioli</i>	0	0	5



DISCUSSION

Citrus natural products are of enthusiasm in antibiotics in substantial amount. So, the scientists however the strips have been less contemplated. Hence, the present investigation focused on strip production with cost-effective methods. Strips were dried and antimicrobial metabolites were dipped in solvents such as phenol, (CH₃)₂CO and isopropyl liquor, and other comparable ones.

Concentrates were exposed to antibacterial and antifungal examination by agar well dispersion strategy. Phenol concentrates were compelled with the exception of carbonyl groups and isopropyl liquor. Phenol concentrate of lemon and orange indicated most extreme zone of restraint of 15 mm and 13 mm in *Salmonella* species. In any case, concentrates of lemon have no impact against in contagious pathogen. Isopropyl liquor removes from lemon demonstrated less restraint zone.

CONCLUSION

The solvents produced can be applied in clinical research and pharmacological studies. The next step of momentum is to look into incorporate further cleansing of concentrate and its assessment for the presence of photochemical parts and their distinguishing proof.

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