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GARLIC EXTRACT EFFECT ON STAPHYLOCOCCUS AUREUS IN DIFFERENT SOLVENTS

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INTRODUCTION

Form the Ayurvedic Perspective, an individual who is balanced and healthy has a strong immune system and, therefore, it will be difficult for microbial infection to take hold. Balance, in Ayurveda is equivalent to health, which is equivalent to a strong and well- functioning immune system capable of defending against microbial infection. The Ayurvedic Approach is to treat the whole person, including application of correct diet, life style recommendations, and herbal supplements. When a person develops an infection, the design of an Ayurvedic herbal formula reflects the holistic approach, based on traditional use, herbs are selected an combined for their ability to inhibit microbial overgrowth in various part of the body and support those organ systems responsible for detoxification and immune function.

- **Resistance in pathogens against antibiotics -**

  The scientific community grossly underestimated the remarkable ability of micro-organism through mutations and genetic transfer, to develop resistance to antibiotics. Although it has been known for some time that bacteria can develop resistance to a particular antibiotic.

- **Medicinal role of garlic (Allium Sativam)**

  Garlic has an exquisite defense system composed of as many different components as the human immune system. Garlic enzymatically produces allicine when it is injured thus allicin is mother natures insecticide. Allicin ws discovered in 1944 by cavallito, who first noted it's potent antimicrobial activity.

- **Antibacterial activity**-Garlic juice & allicin inhibited the growth of Staphylococcus aufeus at low concentrations. Using Glass Powder garlic preparations was found to be effective antibiotic agents many bacteria, the studies demonstrated it's efficacy in inhibiting the growth of some bacteria which had become resistant to one or more of the antibiotics.

AIM

The use of herbal medicines by mankind has long history. There has been revival in interest in the use of herbal medicines because of observed and proven efficacy of some herbals and being free from serious toxic effects associated with synthetic drugs, now-a-day health, food and cosmetics, nutritional supplement based on herbals are more and more popular. The present investigation was carried out to promote the use of herbal medicines against human pathogens.

MATERIALS AND METHODS

- **Collection of bacteria (**Staphylococcus Aureus**)-** bacteria sample was taken from pathological labs & hospitals. Sample was aseptically transfer to culture tube and keep in ice box to maintain their viability sample was collected from urinary tract infection of patients. Five samples per patient were collected samples were carried to the laboratory earlier for treatment and further investigation. Staphylococcus Aureus is a type of bacteria found on Human skin in the nose, Armpit, and other area.

TYPES IDENTIFICATION

- Clinical samples were aseptically streaked on suitable culture plants for obtaining discrete colonies and pure cultures. After 48 hours growth plates were identified morphology and color of bacteria colony were observed and variations in different bacterial colony were studied or further identification bacterial colony were first subjected to gram staining and examine under microscope.

TYPES OF INFECTION

Staphylococci are gram positive aerobic organisms. staphylococcus aurous is the most pathogenic, it typically causes skin infections and sometimes Pneumonia, endocarditic and osteomyelitis. Infections (Septic) arthritis it commonly leads to abscess formation. Some strains elaborates toxins that cause gastroenteritis, scalded skin syndrome and toxic shock syndrome.

Diagnosis is by gram strain and culture.

Treatment is usally with penicillin's. resistant beta-lactams, but antibiotic resistance is common.

Skin infections are the most common from of staphylococcal disease. Superficial infections may be diffuse , with vesicular pustules and crusting (impetigo) or sometimes cellulites or focal with nodular abscesses (Furuncles and carbuncles) deeper cutaneous abscesses are common. severe necrotizing skin infections may occur.

PREPARATION OF CULTURE MEDIUM

- In this experiment we required nutrient agar medium (NA) for bacteria. Those media prepared by following protocol.
- Nutrient agar - pH.7.0
- Peptone - 5.0g.
- Beef extract - 3.0g.
- Nacl - 8.0g.
- Agar - 15g.
- Distilled water - 1000 ml.

COLLECTION OF HERBAL SAMPLES

- Herbal sample used for the experiment is garlic. These herbal materials were collected from crop fields.

PREPARATION OF HERBAL EXTRACT

1. **By using glass powder:-** Garlic part material was reduced to small pieces, ground material 10gm with glass powder in 100ml. Sterile distilled water filter the mixture through filter paper to remove glass powder. Centrifuge the filtrate at 3000 rmp for 30 min. for further removing of glass particles and plant tissue. Collect supernatant, again centrifuge at 10,000 rmp for 30 min. at 4 ^{o}C in digital centrifuge for cell free extract collect supernatant carefully preserve it 4 ^{o}C.
2. **Preparation of herbal extract in different solvent by using vacuum-evaporation method.**

- **Solvents**

1. Distilled water
2. Ethanol
1. Acetone
2. 50% Methanol in chloroform,
3. Methanol

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AQUEOUS (DISTILLED WATER) EXTRACTION

herbal used in this process was garlic the plant part material was reduced to small pieces, dried under shade for at lest twenty (20) days ground the material in electronic grinder to obtain fine powder take 25 gm. Garlic powder in 1000ml. Erlenmeyer flask with paraffin film or Aluminum foil. Keep the flask on electronic shaker for 72 hours with intermittent agitation and soaking at 30^0C for the least 3 days. The mixture was filtered by using whatman's filter paper No. 1. filtrate was centrifuge at 2000 rmp. for 30 min for the cell free extract. Collect supernatant and concentrated under reduce pressure in a rotatory vacuum evaporator until semi solid substances were obtained. This was dried inside the crucible under a controlled temperature (45^0C) to obtain solid extract.

METHOD

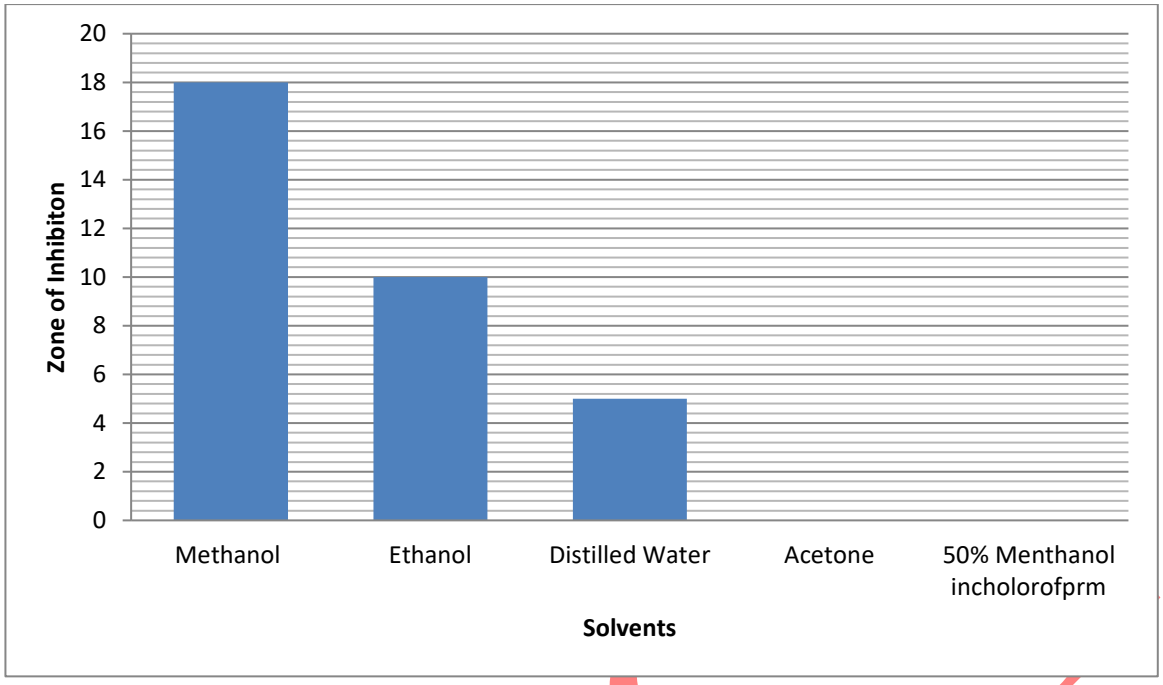
The antibacterial activity of herbal extract in different solvents were determined by Agar well diffusion method. In this method, pure isolate of bacterium was cultured in peptone water for 18 hours these were inoculated by spreading technique on sterile nutrient agar plates containing 7 mm (diameter) wells. At least 25 µl extract was introduced into the well. The plates were incubated for 48 hours at 37 ^{o}C for bacteria after which the zone of inhibition was observed and measured.

OBSERVATION

Table: Effect of Garlic extract in different solvents on the Staphlococcus Aureus after 48 hours.

Solvants	Zone of Inhibition (mm)
Distilled Water	5 mm
Methanol	18 mm
Ethanol	10 mm
Acetone	(-)
50% Methanol in Chloroform	(-)

- mm - millimeter,
- (-) Show no zone of inhibition
- Well diffusion method was followed
- 25 µl crude (undiluted) extract was taken in each well.
- Each plate was incubated at 37 ^{o}C for 48 hours



Comparative effect of garlic extract different solvents on the growth of Staphylococcus Aureus after 48 hours.

RESULTS

- **The results obtained are summarized below :-**

1. Garlic extract shows inhibition zone of 18 mm against Staphylococcus Aureus in Methanol.
2. Garlic extract was different in their effectiveness depending on the solvents used.
3. Garlic extract in Acetone and 50% methanol in chloroform was not able to inhibit the growth of Staphylococcus Aureus.
4. Garlic extract in Ethanol shows 10mm inhibition zone against Staphylococcus Aureus.
5. Garlic extract in Distilled Water shows inhibition zone of 5mm against Staphylococcus Aureus.

The best antibacterial activity was recorded of Garlic exact in Methanol against Staphylococcus Aureus.

FUTURE PROSPECTS

Now-a-day health, foods, cosmetics and Nutritional supplements based on herbals are becoming more and more popular.

The most potent medicine quinine, morphine, atropine, and vincristine and other valuable drugs were discovered by a systematic scientific study of herbal medicines.

Scientific research is in progress to discover new antimicrobial, antifertility, antidiabetic, and anticancer compound etc. from plants.

Simultaneously, all over the world, efforts are in progress to put to use the existing traditional herbs of well proven activity as decoctions, infusion, juices or herbal teas and capsules etc. for several ailments.

All these above-mentioned points shows that we have lot of scope in research work on herbal preparations against human pathogens, food technology and pharmaceuticals industries.

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