(IJISE) 2015, Vol. No. 1, Jan-Jun **e-ISSN: 2454-6402, p-ISSN: 2454-812X**

ANTIBACTERIAL EFFECT OF GARLIC EXTRACT IN DIFFERENT SOLVENTS AGAINST PSEUDOMONAS AERUGINOSA

***Dr. N.L. Sharma, **Anuj Kumar**

**Associate Professor, Meerut College, Meerut*
***Research Scholar, Calorx Teacher's University, Ahmedabad*

INTRODUCTION

Ayurveda is the system of traditional medicine prevalent India since 2000 BC. Ayurveda means the "Science of Life,. Ayurveda derives medicine from nature After through study, experimentation and documentation of hundreds of plants over a period of more than a thousand years. India's ancient sages have come to accurate conclusions about the efficacy of different plants and hearbs. Although efficacy of Ayurveda for a variety of human ailments is well known in around india. Most of the world is not aware of the benefits that could be derived from the unique indian system of medicines. Most of the Ayurvedic preparation are free from side effects or reactions. Ayurveda provides rational means for the treatment of many internal diseases according to Ayurveda is a combination of senses, mind, soul and body. So it is clear that Ayurveda is not only limited to body or physical symptoms but also gives a comprehensive knowledge about spiritual, mental and social health. Ayurveda is a form of treatment by natural remedies, which makes use of the power of nature to restore human beings to a state of balance.

- **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 component 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 pseudomonas aerugiosa 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 & OBJECTIVE

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.

OBJECTIVE

1. Collection, Isolation and identification of human pathogen by regularly visiting to the pathological labes & hospitals.
2. Preparation of herbal extract in Distilled water by using glass powder grinding method.
3. To study the comparative effect of herbal extract in different solvents by well diffusion method.

MATERIALS AND METHODS

- **Collection of bacteria (Pseudomonas aeruginosa)-** 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. Pseudomonas Aeruginosa bacteria is commonly found urinary tract infection especially in females.

Identification

- Clinical samples were aseptically streaked on suitable culture plats 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 for further identification bacterial colony were first subjected to gram staining and examine under microscope.

Signs and Symptoms of Psendomonas aeruginosa

Symptoms of P. aeruginosa very based on the type of infection.

: Infections of the lungs (Pneumonia) may couse:

- Fever and chills
- Difficulty breathing

- Chest pain
- Tiredness
- Cough, Somtimes with yallow, green and bloody mucus.

: Urinary tract infections can cause:

- Storage urge to urinate frequently
- Painful urination
- Unpleasant odor in urine
- Pain in the pelvic area

: Would infections can cause:

- Inflamed wound site
- Fluid leakage from wound

: Ear infections (Swimer's ear) can cause:

- Ear pain
- Decreased hearing
- Redness or swelling of outer ear
- Fever

Causes and risk factors of P. aeruginosa:

P. aeruginosa is spread through improper hygiene, such as from the unclean hands of health care workers or via contaminated medical equipment that wasn't fully sterilized.

Preparation of Culture Medium

- In this experiment we required nutrient agar medium (NA) for bacteria. Those media prepaned 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 Sample

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

Preparation of Herbal Extract

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.

- **Solvents**

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

Antibacterial Activity of Extract

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.

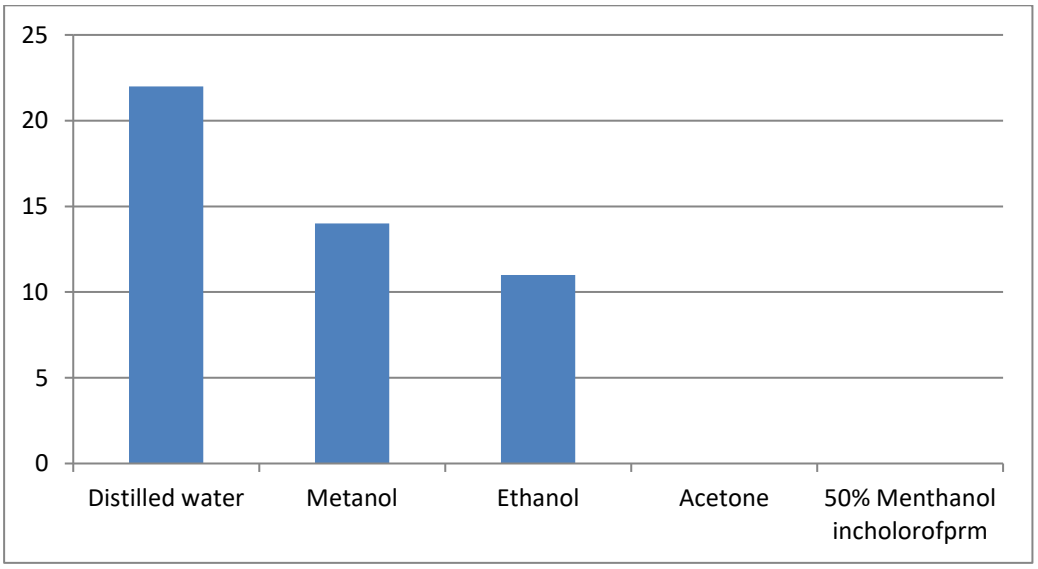
OBSERVATION

Table: Effect of Garlic extract in different solvents on the pseudomonas aeruginosa after 48 hours.

Solvants	**Zone of Inhibition (mm)**
Distilled Water	22 mm
Methanol	14 mm
Ethanol	11 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 Pseudomonas Aerugionsa after 48 hours.



RESULTS

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

1. Garlic extract shows inhibition zone of 22 mm against Pseudomonas aeruginosa in Distilled water.
2. Garlic extract was different in their effectiveness depending on the solvents used.
3. Garlic extract in Acetone and 50% methanol in choloroform was not able to inhibit the growth of Psendomonas aeruginosa.
4. Garlic extract in Methanol shows 14mm inhibition zone against Pseudomonas aeruginosa.
5. Garlic extract in ethanol shows inhibition zone of 11mm against Pseudomonas aeruginosa

The best antibacterial activity was recorded of Garlic exact in Distilled water against Pseudomonas aeruginosa.

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.

REFERENCES

1. Adetumbi, M.A. and Lau B.H. 1983. "Allum Sativam (Garlic) a natural antibiotic,, Med. Hypothesis. 12:227-237.
2. Agarwal A.K., Singh M. Gupta N. "Managerment of giardiasis by an immuno-modulatory herbal drug pippali rasayava,, J. Ethauopharmacol 44:143-146.
3. Cowan, 1999. "Plant products as Antimicrobial Agents clinical microbiology reviews 12:564-582.

4. Kapoor L.D., 1990, "Handbook of Ayurvedic medicinal plants"
5. Prasad G. and Sharma V.D. 1980, "Efficacy of Garlic (Allium Sativum) treatment against experimental candidiasis in chicks." Br. vet. J. 136:448-51.
6. Sharma V.D. et al. 1977, "Antibacterial Property of Allium Sativum Linn: in vivo studies" ind. J. exp.biol., 15:466-8,