ANTI-BACTERIAL ACTIVITY ON GAUR LEAF

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ABSTRACT

The antibacterial activity against the GAUR LEAF was scrutinized against two bacteria staphylococcus aureus and Escherichia coli using Agar diffusion method. The GAUR leaf oil in undissolved form have not shown the antibacterial activity against these organism when it is extracted by using water as solvent.

KEYWORD: Antibacterial activity, gaur leaf, S.aureus, E-coli.

INTRODUCTION

1. Introduction to bacteria and antibacterial

Antibacterial agents or compounds are used to treat bacterial infections. The toxicity to human and other animal from antibacterial is generally considered low. The discovery, development and clinical use of antibacterials during the 20th century has substantially reduced mortality from bacterial infections. antibacterials are among the most commonly used drug. However, antibacterials are also among drugs commonly misused by physicians, such as usage of antibiotic agents in viral respiratory tract infections.

1.1 Escherechia coli

Bionominal name – Escherechia coli.

Synonym – bacterial coli.

E. coli bacteria were discovered in the human colon in 1885 by German bacteriologist Theodor Escherich. Dr. Escherich also showed that certain strains of the bacterium were responsible for infant diarrhea and gastroenteritis, an important public health discovery. Although E. coli bacteria were initially called Bacterium coli, the name was later changed to Escherichia coli to honor its discoverer.
*E. coli* is often referred to as the best or most-studied free-living organism. More than 700 serotypes of *E. coli* have been identified. The “O” and “H” antigens on the bacteria and their flagella distinguish the different serotypes. It is important to remember that most kinds of *E. coli* bacteria do not cause disease in humans. Indeed, some *E. coli* are beneficial, while some cause infections other than gastrointestinal infections, such as urinary tract infections.

![Fig. no 1 E.coli](image1)

1. *Staphylococcus aureus*

*Staphylococcus aureus* is a gram-positive coccal bacterium that is a member of the *Firmicutes*, and is frequently found in the human respiratory tract and on the skin. It is positive for catalase and nitrate reduction. Although *S. aureus* is not always pathogenic, it is a common cause of skin infections (e.g. boils), respiratory disease (e.g. sinusitis), and food poisoning. Disease-associated strains often promote infections by producing potent protein toxins, and expressing cell-surface proteins that bind and inactivate antibodies. The emergence of antibiotic-resistant forms of pathogenic *S. aureus* (e.g. MRSA) is a worldwide
problem in clinical medicine. *staphylococcus* was first identified in 1880 in Aberdeen, Scotland, by the surgeon Sir Alexander Ogston in pus from a surgical abscess in a knee joint.

**1.3 Ceftriaxone injection I. P.**

Ceftriaxone is an antibiotic used to treat a wide variety of bacterial infections. This medication is known as a cephalosporin antibiotic. It works by stopping the growth of bacteria.

Class: antibiotic, anti-infective agent.

Molecular formula = $C_{18}H_{18}N_{8}O_{7}S_{3}$

Molecular mass = 554.58 gm/mol

![Fig 3 ceftriaxone](image)

**IUPAC NAME**: $(6R,7R)-7-\{[(2Z)-2-(2-amino-1,3-thiazol-4-yl)-2-(methoxyimino)acetyl]amino\}-3-\{[(2-methyl-5,6-dioxo-1,2,5,6-tetrahydro-1,2,4-triazin-3-yl)thio]methyl\}-8-oxo-5-thia-1-azabicyclo[4.2.0]oct-2-ene-2-carboxylic acid.

**1.4 Gaur leaf**

synonym: gavar leaf, cluster beans.

biological source: obtained from plant *Cyamopsis tetragonoloba*.

family: fabaceae.

Chemical constituents: its kernel consist of a protein – rich germ (43-46 %) and a relatively large endosperm (34-40%) , containing big amount of the galactomannan. The latter is polysaccharide containing polymers of manose and galactose in a ratio of 2:1.
Phenolics of gavar

![Genistein](image)

![Quercetin](image)

Sterols of gavar leaf

![Beta-sitosterol](image)

Uses
Leaves are used in asthma and to cure night blindness where as the pods and seed are used to cure inflammation, sprains (Khare, 2004), arthritis (Katewa et al, 2004), as anti-oxidant, antibilious, laxatives and in polluting boiling. As per Ayurveda the plant is used to reduce fire and can be used as cooling, digestive, tonic, galactogogue, useful in constipation, dyspepsia, anorexia, galatia, hyetalopia and vitated condition of kapha and pitta.

Product description
The origin of *Cyamopsis tetragonoloba* is unknown, since it has never been found in the wild. It is assumed to have developed from the African species *Cyamopsis senegalesis*. It was further domesticated in India and Pakistan, where it has been cultivated for many centuries. Guar grows well in arid to semiarid areas, but frequent rainfall is necessary.
This legume is a very valuable plant within a crop rotation cycle, as it lives in symbiosis with nitrogen-fixing bacteria. In fact, agriculturists in semi-arid regions of Rajasthan follow crop-rotation and use guar as a source to replenish the soil with essential fertilizers and nitrogen fixation, before the next crop. Guar as a plant has a multitude of different functions for human and animal nutrition agent-containing seeds (guar gum) are today the most important use.

**Fig no 4 Guar leaf**

**MATERIAL AND METHOD**

**Extract the essential oil from leaf of gavar:** extraction of gaur leaf is done by simple swaras preparation. For this purpose water is used as a solvent.

1. Approximately Weigh 30 gm of freshed guar leaf.
2. Then take it into mortar, for trituration.
3. Take a few drops of distilled water into mortar and triturate it. transfer this material into muscline cloth and curt it to get liquid.
4. Finally we got a extract of gavar leaf.

**2.1 determination of antimicrobial activity**

**AGAR-WELL DIFFUSION METHOD**

**Principle =**

The antimicrobial present in the oil are allowed to diffuse out into the medium and interact in a plate freshly oil with the test organism. The resulting zones of inhibition will be uniformly circular as there will be a confluent lawn of growth. The diameter of zone of inhibition can be measured in millimeters.
Reagents and Requirement =

- **Nutrient agar plate** = It is prepared by dissolving 2.8gm of nutrient agar in 100ml of distilled water and into that 2gm of agar-agar powder added for solidification. The dissolved medium was autoclaved at 15 lbs pressure at 121°C for 15 minute. The autoclaved medium was mixed well and poured into 3 petriplates upto 100mm while still molten.
- **Macconkey Nutrient medium** = It is prepared by dissolving 2.5gm of macconkey medium in 50ml of distilled water. The dissolved medium was autoclaved at 15 lbs pressure at 121°C for 15 minute. The autoclaved medium was mixed well and poured into 3 petriplates upto 100mm while still molten.

Procedure =

- Six sterile petriplate containing 25 to 30 ml of nutrient medium were seeded with 24 hour culture of bacterial strain.
- The procedure is taken sterile petriplate into that nutrient medium were added in aseptic area or aseptic condition to avoid microbial contamination.
- After adding of nutrient medium the bacterial strains are incorporated into that sterile petriplate.
- Then kept this plate into an incubator for 24 Hr. For growth of microbes.
- After 24 Hr. Remove the plate from incubator and in aseptic condition or in between two burner and bore the plate.
- Into that bore add sample that is oil from gaur leaf.
- Each plate of nutrient agar and macconkey media is prepared according to this manner and sample were added.
- In plate no. 1 & 2 bacterial strains is taken i.e. S.aureus and into the bore of that plate 0.1 ml of oil is added. The plate were kept into an incubator for 24 hr. For the growth of microbes. The growth is observed and noted the zone of inhibition. This plate are nutrient agar plate for S.aureus.
- In plate no. 3 & 4 bacterial strains is taken i.e. E-coli and into the bore of that plate 1 ml of oil is added. The plate were kept into an incubator for 24 hr. For the growth of microbes. The growth is observed and noted the zone of inhibition. This plate are macconkey plate for E-coli.
- The plate no. 5 & 6 is taken as standard for the both medium and the plate were kept into an incubator for 24 hr.
RESULT AND DISCUSSION

Table No. 1) Antibacterial activity of gaur leaf oil

<table>
<thead>
<tr>
<th>Test sample</th>
<th>dose (0.1ml)</th>
<th>Zone of inhibition (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>S.aureus</td>
</tr>
<tr>
<td>Gaur leaf oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard Drug (Ceftrixone)</td>
<td>9</td>
<td>7 to 9</td>
</tr>
</tbody>
</table>

The gaur leaf oil have not shown the zone of inhibition in dose of 0.1 ml against S.aureus as compared with standard Ceftrixone i.e. 9 mm.

The gaur leaf oil have not shown the zone of inhibition in dose of 0.1 ml against E-coli as compared with standard Ceftrixone i.e. 7 to 9 mm.
CONCLUSION
In the present study, the drug gaur leaf was subjected to swaras preparation and resultant extract was evaluated for antibacterial activity using agar well diffusion method. The study reveals no antibacterial property to swaras preparation of gaur leaf oil extracted by using solvent as water have not possess any antibacterial activity against bacteria (S.aureus & E-coli).

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REFERENCES


12. Indian Hydrocolloids


