Studies on Antimicrobial Activity of Syzygium Cumini and Syzygium Alternifolium

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ABSTRACT:

Background: Antibiotic defiance in bacterial is a satisfactory obstacle in the latest wor ld. Day-to-day novel dopes are being intact to defeat this drawback. The goal of this is trained used to be to check antimicrobial resistance of the Syzygium cumini Syzygium Alternifolium fruit. The dried fruit of Syzygium Cumini Syzygium Alternifolium fruits are located in a southern state of India.

Method: The extract of dried fruit and seed of Syzygium Cumini Syzygium Alternifolium was once ready through using specific solvent of Ethyl Acetate. These ready extracts have been used for evaluation of antibacterial ability in opposition to three Gram-positive bacterial stains (Escherichia coli, Salmonella typhi, Pseudomonas aeruginosa) and two gram-negative bacterial stains (Streptococcus, Staphylococcus aureus).

Results: The antimicrobial ability was appraised by Disc diffusion assay of Syzygium Cumini Syzygium Alternifolium. The zone of inhibition used to be determined at the concentration of (500µg/ml) in G.Gummi-gutta Streptococcus & Pseudomonas aeruginosa (14mm), Staphylococcus aureus & Salmonella typhi (9mm), Escherichia coli (8mm). The zone of inhibition was once determined at the concentration of (500µg/ml) in G.Sylvestre. The Streptococcus (11mm), Staphylococcus aureus & Escherichia coli (9mm), Salmonella typhi (10mm), Pseudomonas aeruginosa (8mm) respectively.

Conclusion: Due to the fact, the extract confirmed a wide spectrum of the antimicrobial undertaking of each Gram positive and gram negative bacterial isolates. Comparative reports of the. Syzygium Cumini Syzygium Alternifolium fruit and seed. The nice one among Syzygium Alternifolium. Can be utilized as a bio preservative or therapeutic agent to prevent a few illnesses. The dried fruit of Syzygium Alternifolium would characterize a novel antimicrobial obtain with steady, adoptive energetic compounds that may prove a scientific base for the consumer in recent treatment.

Keywords: Antimicrobial activity, Gram positive, Gram negative


INTRODUCTION:

The demand for medicinal plants in health care is about 70-80% [1]. It is believed that the use of plants or plant based materials for medicinal purposes has been associated with fewer side effects [2]. The therapeutic effects of medicinal plants were shown to be associated with their chemical constituents [3]. The natural compounds are
reported to have different pharmacological activities antimicrobial, antiulcer, anticholinesterase, anticancer, spasmodytic, antiviral, antioxidant and analgesic [4,5]. The genus *Syzygium* (Family: Myrtaceae) comprises about 500 species throughout the globe and most of them are evergreen trees and shrubs[6,7]. Several species are grown as ornamental/tree crops for glossy foliage and a few produce edible fruits. *Syzygium alternifolium* (Wt.) Walp. (SA) is an endemic aromatic tree, distributed in Assam and Andhra Pradesh states, India [8,9,10]. In local language (Telugu) it is known as mogi/ movi. The plant parts used in traditional medicine to cure various diseases viz., tender shoots, fruits and leaves for dysentery, diabetes, seeds for diabetes, ulcers, dysentery, burning sensations in stomach and joint pains [11,12,13]. Several *Syzygium* species were reported to possess antibacterial antifungal anti inflammatory and antioxidant activities. *S. alternifolium* was reported to possess hypoglycemic and antihyperglycemic activity and antimicrobial activity[14]. The phytochemical studies revealed that only flavonoids and terpenoids were reported from the plant and the plant material has been unexploited much for detailed studies [15,16]. Based on review of literature, it was found that, very few reports were noticed on antimicrobial activity of the fruit [17]. Hence, the present study designed to evaluate the antimicrobial activity of *Syzygium Cumini* and *Syzygium Alternifolium* fruit.

**MATERIALS AND METHODS:**

**Sample collection**

The dried fruits of *Syzygium Cumini* and *Syzygium Alternifolium* which was readily available within the retail outlets (Vernacular title: Novel seed) was once bought from a neighborhood place in Kanyakumari. The regional botanist has authenticated the sample. These two samples have been maintained in particular room temperature.

**Extraction procedure**

The dried fruit (200gm) has been successively extraction by the soxhlet apparatus. Ethyl acetate solvent used to extraction was carried out. The extract has been centered and distilling in a rotary evaporator. The extract was preserved in the container kept at 4-5 mins and further use.

**Chemicals, Media and Antibiotic**

Ethyl acetate solvent, Nutrient broth, and Nutrient agar, Muller Hinton agar (MHA), antibiotic Ampicillin has been bought from Life Tech Research center, Chennai.

**Test organisms**

The antibacterial properties were investigated the selected five human pathogenic bacteria to include Gram-negative (*Escherichia coli* (MTCC B1560), *Salmonella typhi*, *Pseudomonas aeruginosa* (MTCCB2297), and Gram-positive (*Streptococcus* (MTCC B2274), *Staphylococcus aureus* (MTCC B3160) bacteria. The entire bacterial strains were pure isolates got from and had been maintained in nutrient agar.

**Preparation of Inoculums:**

Nutrient agar slant used to the stock culture was maintained at 4°C. Then the culture was transferred to the tubes. The tubes contain nutrient broth incubated at 24hrs at 37 °C.

**Determination of Antimicrobial Activity**

**Sensitivity discs**

Whatman no1 filter paper used to the sterile sensitivity disc (5 diameters) prepared. The disc was sterilized and autoclaving at a particular temperature for 121°C for 5 mins. The discs were soaked within the extracts for 10 minutes and allowed to dry. The dried discs carrying the bioactive compounds were used for disc diffusion assay.

**Preparation of Bacterial Suspension**
The peptone water used to the pure isolated colonies of bacterial colonies had been inoculated and incubated at 37°C for 48 hrs and have been used as inoculums for lawn culture on Mueller Hinton Agar (Hi-Media) for assaying the antibacterial recreation of the extracts.

**Agar Disc Diffusion Method:**

The Muller Hinton agar (MHA) medium was used to the disc diffusion approach of antibacterial extracts. The Muller Hinton agar (MHA) medium was poured in the Petri plate. After that, the medium was inoculated solidified and the plate with a sterile swap with the bacterial suspension. The different concentration (Concentration: 1000µg, 750µg, and 500 µg) the disc were placed at MHA plates and add 20 µl of the sample. Finally, the antimicrobial properties were determined with the measuring of the zone of inhibition (diameter)

**Zone Analysis**

After incubation, the antibacterial activity of the extracts in opposition to each bacterial stain was once assayed through the nearest mm the zone of inhibition has measured the diameter. Then the results have been recorded and when compared.

**RESULTS AND DISCUSSION:**

**Antibacterial activity of Syzygium Cumini**

![Antibacterial activity of Syzygium Cumini](image)

Fig 1: Zone of inhibition of dry rind of *Syzygium Cumini* Gram Positive & Gram Negative Test organisms

<table>
<thead>
<tr>
<th>Organisms</th>
<th>Zone of Inhibition (mm)</th>
<th>Antibiotic (µg/ml)</th>
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<tbody>
<tr>
<td></td>
<td>Concentration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1000</td>
<td>750</td>
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<tr>
<td><em>Streptococcus</em></td>
<td>28</td>
<td>23</td>
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<tr>
<td><em>Staphylococcus aureus</em></td>
<td>14</td>
<td>9</td>
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<tr>
<td><em>Escherichia coli</em></td>
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<td>8</td>
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<tr>
<td><em>Salmonella typhi</em></td>
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<td>9</td>
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<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>28</td>
<td>23</td>
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Table 1: Invitro Antibacterial properties of *Syzygium Cumini* on Test organisms (Identified by the diameter of Inhibition zone)

Antibacterial activity of *Syzygium Alternifolium*

Fig 2: Zone of inhibition of *Syzygium Alternifolium* Gram Positive & Gram Negative Test organisms

<table>
<thead>
<tr>
<th>Organisms</th>
<th>Zone of Inhibition (mm)</th>
<th>Antibiotic (1mg/ml)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>9</td>
</tr>
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<td><em>Salmonella typhi</em></td>
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<td>10</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 2: Invitro Antibacterial properties of *Syzygium Alternifolium* in Test organisms (Identified by the diameter of Inhibition zone)
DISCUSSION:
The antibacterial activity of Ethyl acetate extract of *Syzygium Cumini* and *Syzygium Alternifolium* has assayed Invitro through agar disc diffusion method in opposition to bacterial species. Table 1&2 summarizes microbial growth inhibition. The huge antibacterial endeavor of the plant extract was once similar to Ampicillin (20µg/ml). The Antimicrobial pastime of the bacterial strains was prepared. Comparative study of antibacterial activity of those medicinal crops. *Syzygium Alternifolium* confirmed very best antibacterial activity against gram-positive and gram-negative organisms. The Antimicrobial endeavor of ethyl acetate in opposition to gram positive and gram negative organisms increases as the volume of extracts increases.

CONCLUSION:
*Syzygium Cumini* and *Syzygium Alternifolium* Posses’ significant antibacterial activity. Extra study is needed for the isolation and identification of energetic precept present within the extracts which could almost certainly be exploited for pharmaceutical use. Additional studies have got to be equipped to determine the rate of toxicity, their mode of motion and dose-dependent activity against various strains of microorganism. From the above be knowledgeable concluded that the dried scale of fruit of *Syzygium Cumini* and *Syzygium Alternifolium* could characterize a new antimicrobial supply, with steady biologically lively accessories that may set up a scientific base for the use in modern-day remedy. Furtther experiences are needed to remote and represent the bioactive requisites to increase new antimicrobial drug from *Syzygium Cumini* and *Syzygium Alternifolium*

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REFERENCE:


