Antibacterial activity of *Amorphophallus commutatus*, an endemic plant of Western Ghats, South India.

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**ABSTRACT**

*Amorphophallus commutatus* (Schott) Engl (Araeaceae), is a rare cormous herb. Aqueous and organic solvent extracts of the tubers were investigated for anti-bacterial activity properties by using disc diffusion method, against pathogenic strains of gram negative bacteria (*Escherichia coli, Proteus vulgaris, Pseudomonas aeruginosa* and *Salmonella typhii*). The different extracts differed significantly in their anti-bacterial properties with the benzene extract being very effective followed by petroleum ether, chlorofrom and ethyl acetate extracts. Aqueous and methanol extract showed very least activity. The results of this study support the use of this plant in traditional medicine.

**Key words:** *Amorphophallus commutatus*; anti-bacterial activity; human pathogens.

1. **INTRODUCTION**

Plants still continue to be almost the exclusive source of drugs for the majority of world’s population (Sokmen et al., 1999). Substances derived from higher plants constitute 25% of prescribed medicine and 74% of the 121 bioactive plant – derived compounds currently in worldwide use were identified via research based on leads from ethnomedicine (Farnsworth prescribed medicine and 74% of the 121 bioactive plant –derived compounds currently in Nutrient agar slants. Chanderghat. The bacterial strains were grown in Muller Hinton plates at 37ºC and maintained in room temperature. The mixture was extracted by agitation on a rotary shaker. The extract blended for each solvent. The blended material was transferred to a beaker and soaked separately according to the method described by (Harbone,1998) with little modifications. Seventy five grams of plant material were air-dried, crushed and blended in to powder using an electric blender for each solvent. The blended material was transferred to a beaker and soaked separately in temperature. The mixture was extracted by agitation on a rotary shaker. The extract obtained was vacuum- dried and used for further test.

2.2. Preparation of extracts

Organic solvents in the increasing order of polarity (Petroleum ether, benzene, chloroform, Ethyl acetate, methanol) and aqueous extract (hot water) of the plant materials were prepared according to the method described by (Harborne,1998) with little modifications. Seventy five grams of plant material were air-dried, crushed and blended in to powder using an electric blender for each solvent. The blended material was transferred to a beaker and soaked separately in room temperature. The mixture was extracted by agitation on a rotary shaker. The extract obtained was vacuum- dried and used for further test.

2.3. Microorganisms tested

A total of four bacterial cultures (*Escherichia coli, Proteus vulgaris, Pseudomonas aeruginosa* and *Salmonella typhii*) were used in this study. The cultures were procured from MTCC, Chandigarh. The bacterial strains were grown in Muller Hinton plates at 37ºC and maintained on Nutrient agar slants.

### Table 1. Anti-bacterial activity of *Amorphophallus commutatus*

<table>
<thead>
<tr>
<th>S.No</th>
<th>Organism</th>
<th>Parts</th>
<th>Zone of inhibition (mm)</th>
<th>Disc diffusion method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>E.coli</em></td>
<td>Tub</td>
<td>81</td>
<td>S1</td>
</tr>
<tr>
<td>2</td>
<td><em>Proteus vulgaris</em></td>
<td>Tub</td>
<td>89</td>
<td>S2</td>
</tr>
<tr>
<td>3</td>
<td><em>Pseudomonas</em></td>
<td>Tub</td>
<td>14</td>
<td>S3</td>
</tr>
<tr>
<td>4</td>
<td><em>Salmonella typhii</em></td>
<td>Tub</td>
<td>17</td>
<td>S4</td>
</tr>
</tbody>
</table>

S1: Petroleum ether; S2: Benzene; S3: Chloroform; S4: Ethyl acetate; S5: Methanol; S6: Hot water.

There are reports on other Araeaceae species extracts that exhibit antibacterial activity. Although these tested plant extracts may contain antibacterial constituents further phytochemical and pharmacological studies by bioassay guided fractionation will be necessary to isolate the active constituent and evaluate the antibacterial activity against a wide range of microbial population.

Khan et al., (2008) have reported the antibacterial activity of 3,5-diacytambulin, a flavonoid isolated from the chloroform fraction of *Amorphophallus campanulatus*. Another report indicates the antibacterial activity of ambyline, a triterpenoid isolated from the petroleum ether soluble fraction of *Amorphophallus campanulatus*. (Khan et al., 2008). Analyses of our reports indicate that both petroleum ether chloroform and benzene has established good values on antibacterial activity compared to the other extracts. Therefore our results are in coherence with the above said reference. The antibacterial activity of the petroleum ether extract might be due to the flavonoid ambyline. Similarly the chloroform fraction might contain 3,5-diacytambulin as a lead molecule exhibiting antibacterial activity. This is the first step in Bioassay guided fractionation. The petroleum ether, chloroform and benzene extracts require further fractionation and analysis to identify the active principle.
In fine the tuberous extracts of plant had potential antibacterial properties with significant growth inhibition against Pseudomonas and Salmonella, exhibited by petroleum ether, chloroform and benzene extracts.

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6. REFERENCE


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