*Biosciences, Biotechnology Research Asia* Vol. **7**(1), 453-456 (2010)

# Antibacterial activity of seeds, stems and roots of *Leea aequata*

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(Received: August 02, 2008; Accepted: September 13, 2008)

**ABSTRACT**

A vigorous search of medical plants during the last century has resulted in the discovery of huge number of plants which have been found to be of great use in the treatment of diseases and promotion of health. The medical plants have been under investigation and related compound which are mainly the products from above ground parts of seed plants are insufficiently explored for their Antibacterial activities. Recently some workers have demonstrated Antibacterila substances in some seed plants. The present investigation is a carried out to examine the Antibacterial activity of various successive extracts obtained from the stems and roots of leea aequata.

**Key words:** Antibacterial, Medicinal plants, *Leea aequata*, Microorganism.

## INTRODUCTION

The medicinal plants have been under investigation and related compounds which are mainly the products from above gournd parts of seed plants are insufficiently explored for their antimicrobial activities[1-2].But still more investigations are needed because many of the micro-organisms are able to produce more potential antimicrobial substances like antibiotics. Recently some workers[1-7] have demonstrated antimicrobial substances in some seed plants.

The micro organisms potentially pathogenic to man and animals can also survive saprophytically in nature, particularly in the habitats of man, animals and cultivated fields. It is now well established that the micro-organisms in all habitats live in an atmosphere of various organic compounds, which may be produced by themselves or by the decomposition of organic wastes. Further these natural products are known to play an important role against microorganism. Most of these natural products belong to higher series of alcohols, aldehyde and acetylenic products[8]. Many of these substances are inhibitary rather than simulatory to micro-organisms[9]. The present investigation was carried out to examine the Antibacterial and antibacterial activity of various successive extracts obtained from the stems and roots of *Leea aequata*[10-12].

Powdered (1 Kg.) seeds, stems and roots of *Leea aequata* were successively extracted with various solvents (1 Litre) from non-polar i.e. petroleum ether, benzene, solvent ether, chloroform, acetone and alcohol in soxhlet apparatus for 30 hours, Then solvents were evaporated under reduced pressure and residues were redissolved in the same solvents (500 mg/ml) and used to study their antibacterial activity. The antibacterial activities were assayed following cups or well method as described by Vincent & Vincent[14].

**Culture Media**

For antibacterial studies, the nutrient agar medium having the following composition was used:

| | | | |
|---|---|---|---|
| 1. | Beef extraxct | - | 5.00gms |
| 2. | Peptone | - | 5.00gms. |
| 3. | Agar | - | 20 gms. |
| 4. | Sodium Chloride | - | 5.00gms |
| 5. | Distilled water | - | 1000ml. |

**Table 1: Antibacterial Activity of seeds of Leea aequata**

| S. No. | Organism | Diameter of growth of Inhibition (mm)Including the Diameter of well (10 mm.). Seeds extract in Different solvents control | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Petether | Benzene | Solv.ether | Chloroform | Acetone | Alcohol | 500ppm |
| 1. | *Salmonella paratyphi* (1st strain)(-) | - | - | - | 14 | - | 18 | 28 |
| 2. | *Salmonella paratyphi* (IIstrain)(-) | 14 | - | 16 | 12 | - | 15 | 28 |
| 3. | X.malvacearum (1st stain)(-) | 22 | 17 | - | 16 | 24 | 18 | 28 |
| 4. | X.malvacearum (II stain)(+) | 20 | 15 | 12 | 18 | 16 | 30 | 28 |
| 5. | *Staphylococus albus* (+) | 18 | 14 | - | 16 | 15 | 22 | 22 |
| 6. | X.compestria(-) | - | - | - | - | - | 14 | 26 |
| 7. | *Bacillus anthracis* (+) | 19 | 16 | 18 | 20 | 26 | 22 | 36 |
| 8. | *Bacillus pumilis* (+) | 23 | 30 | 12 | 38 | 18 | 16 | 38 |

**Table 2: Antibacterial Activity of seeds of Leea aequata**

| S. No. | Organism | Diameter of growth of Inhibition (mm) Including the Diameter of well (10 mm.). Seeds extract in Different solvents control | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Petether | Benzene | Solv.ether | Chloroform | Acetone | Alcohol | 500ppm |
| 1. | X.malvacearum (1st stain)(-) | 12 | 12 | 16 | 16 | 56 | 24 | 28 |
| 2. | X.malvacearum (II stain)(+) | 12 | 14 | 15 | 12 | 16 | 18 | 28 |
| 3. | *Salmonella paratyphi* (1st strain)(-) | 16 | 16 | 18 | 30 | 26 | 18 | 28 |
| 4. | *Salmonella paratyphi* (IIstrain)(-) | 20 | 22 | 18 | 16 | 56 | 18 | 28 |
| 5. | *Staphylococus albus* (+) | 12 | 38 | 16 | 14 | 34 | 39 | 22 |
| 6. | *Bacillus anthracis* (+) | 20 | 22 | 17 | 16 | 36 | 32 | 36 |
| 7. | *Bacillus pumilis*(+) | 16 | 18 | 20 | 12 | 30 | 20 | 38 |
| 8. | X.compestria(-) | 14 | 16 | 12 | 12 | - | 18 | 26 |

**Table 3: Antibacterial activity of roots of Leea aequata**

| S. No. | Organism | Diameter of growth of Inhibition (mm) Including the Diameter of well (10 mm.). Seeds extract in Different solvents control | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Petether | Benzene | Solv.ether | Chloroform | Acetone | Alcohol | 500ppm |
| 1. | *Salmonella paratyphi* (1st strain)(-) | 15 | 16 | 21 | - | - | 20 | 28 |
| 2. | *Salmonella paratyphi* (IIstrain)(-) | 37 | 12 | 18 | - | - | 19 | 28 |
| 3. | *Bacillus anthracis* (+) | 28 | 13 | 14 | 21 | 15 | 18 | 36 |
| 4. | *Bacillus pumilis* | 14 | 15 | 17 | 19 | 14 | 39 | 38 |
| 5. | *Staphylococus albus* (+) | 11 | - | - | - | - | 17 | 22 |
| 6. | X.malvacearum (II stain)(+) | 18 | - | 15 | - | - | 11 | 28 |
| 7. | X.compestria(-) | 13 | - | - | 15 | 16 | 23 | 26 |
| 8. | X.malvacearum (1st stain)(-) | 12 | - | - | - | - | 22 | 28 |

**Sterilization**

The media and the slants for preparing for sub-cultures of organisms will be sterilized by autoclaving at 15 lbs. pressure for 30 minuts. The petri dishes were sterilized by keeping overnight in an electrically heated air over at 140°C.

**Test organisams**

The following eight human and plant pathogenic bacteria were used for of the activity of successive seeds extractives.

*Bacillus anthracis* (+), *Bacillus pumilis* (+), *Samonella paratyphi* (1st strain) (-), *Samonellla paratyphi* (II strain) (-), *Staphylococus albus* (+), *X. compestria* (-), *X. malvacearum* (1st strain) (-), *X. malvacearum* (II strain) (+).

**Preparation of agar plate**

Four percent (v/v) of the spore suspension of each organism will be mixed in sterilized nutrient agar medium. 20ml. of this were poured in each sterilized petridish (90 mm diameter) and allowed to gel. After half an hour, cups or wells were made in agar plates as described by Vincent and Vincent (1944) and 0.02 ml. of sample extract was dispensed into the cups. In the same way controls were run with 500 ppm. Solution of Acromycin and streptomycin against gram positive and gram negative bacteria respectively. The plates were then incubated at 32+|1°C. for 12 hours and inhibition zones were measured. The experiment was run in triplicate and the data were recorded in Table 4-6. Critical examination of the data obtained from Antibacterial activity of extracts of seeds, stems and roots of *Leea aequata* revealed that degree of activity depended on the nature of the compounds present in them and their capacity of diffusion into agar medium. It has also found that in nature the accumulation of various organic compounds during decomposition of organic matter, produced from plants by large number of microorganism, must the major factor for the inhibition of growth of these micro-organisms. Therefore the tested extracts showing adequate Antibacterial activity may by be potentially explored as surface applications for preventing dermal disease caused by various fungi.

The perusal of data recorded in tables (1 to 3) revealed that activity of such successive

extracts depends on the nature of their effective ingredients and their capacity of diffusion into agar medium. In the present experiment these extracts were found to be highly toxic against the test bacteria. It has been observed that bacteritoxicity in extracts of seeds is neither a generic nor a family character but it is due to the effective components contained in them and their nature against a particular micro organism. Such isolated substances from higher plants have also been found to possess systematic activity and less phytotoxicity as compared to other synthetic. Antimicrobial substances[15-19]Strong bacteritoxicity as extract may be an account of isolation might prove of greater therapeutic value and may be explored in future for ameliorating human sufferings.

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