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5. In – Vitro Antibacterial Potentiality of Indian Medicinal Plant *Murraya Koenigii*

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ABSTRACT:

The aim of this study was to examine the antibacterial effects of curry leaves. After drying we grind the leaves to make powdery form. The powder was mixed with ethanol or methanol to make extract for examine antibacterial effect against some specific bacteria. The methanol extract of curry leaves more effective against Streptococcus sp., showed zone of inhibition 38.0 ± 2.0mm as compared to zone of inhibition of Staphylococcus sp. (34.1±1.0mm) and E. coli (36.5±1.0mm).

KEYWORDS:

Murraya koenigii, Bacteria, Inhibition zone, Antimicrobial effects.

Introduction:

Curry leaves (*Murraya koenigii*) are well known spice for distinct aroma due to the presence of certain volatile oil and their ability to improve digestion. It is very common in Asian country for flavoring food. Even after dying it retain its slight pungent, better taste. It is very famous in traditional India for its medicinal properties. It is associated with Reactive Oxygen Species (ROS) like hydroxyl radicals, hydrogen peroxide and superoxide anion radicals. In case of stress our body produce high amount of ROS that cause cell injury, that cause nucleic acid damage, and damage of other cellular biomolecules. Although natural antioxidant use for treatment of various oxidative stress disease**.** It may be resist by various multidrug resistant pathogens. This increase has made the use of broad spectrum antibiotics and immuno-suppressive agents indiscriminately. Synthetic drugs are not only expensive and inadequate for treatment of diseases but are often with serious side-effects. Essential oils are widely used secondary metabolites produce by aromatic plant due to potent biological activities. *Murraya koenigii* leaves contain huge amount of proteins, carbohydrate, fiber, minerals, carotene, nicotinic acid, Vitamin C, Vitamin A, Calcium and Oxalic acid. It also contains crystalline glycosides, carbazole alkaloids, koenigin, girinimbin, iso-mahanimbin, koenine, koenidine and koenimbine. Triterpenoid alkaloids cyclomahanimbine, tetrahydromahanimbine are also present in the leaves. Murrayastine, murrayaline, pyrayafolinecarbazole alkaloids and many other chemicals have been isolated

from *Murraya koenigii* leaves. This leaves have properties to cure diarrhea, dysentery, can prevent vomiting tendency. Curry leaves as well as seeds are a source of essential oil used in soap and perfumery industry.

Leaves root and bark having other medicinal properties like relief from renal pain. Previous phytochemical investigations on this plant revealed the presence of carbazole alkaloids, andcoumarins. The present study is aimed at preliminary phytochemical screening of the root extracts of *Murraya koenigii* and evaluation of the same for potential.

This study was undertaken to evaluate the antibacterial properties of the ethanol, methanol and aqueous extracts of curry leaves (*Murraya koenigii*) on selected clinically pathogenic bacteria isolates.

Materials and Methods:

Site of Experiments:

The whole experiments were carried out in the lab room of Rabindra Mahavidyalaya, Champadanga, Hooghly, W.B, India.

Collection of Microorganisms:

The tested microorganism (*Staphylococcus* sp., *Streptococcus* sp., and *E. coli*.) bought together from MTCC Chandigarh, India.

Collection of Plant Materials:

The leaf of testing plant *Murraya koenigii* (Curry) was collected from the field of Champadanga, Hooghly, W.B, India.

Methanol extraction:

To make methanol extract, add 10gm of curry powder to 20ml of 70% aqous methanol solution (w/v), then it cover by filter paper and keep on rotary shaker for 24hrs. Then keep in dark for 2-3 day at room temperature and then collect supernatant and solvent is evaporated by incubating at room temperature for 48hrs to make final volume 400mg/ml of curry leaves.

Ethanol extraction:

To make ethanol extract, add 10gm of curry powder to 20ml of ethanol and distilled water (8: 2 w/v), then it cover by filter paper and keep on rotary shaker for 24hrs.

Then keep in dark for 2-3 day at room temperature and then collect supernatant and solvent is evaporated by incubating at room temperature for 48hrs to make final volume 400mg/ml of curry leaves.

Aqueous extraction:

To make aqueous extract, add 10gm of curry powder to 20ml of 70% aqueous solution (w/v), then it cover by filter paper and keep on rotary shaker for 24hrs.

Then keep in dark for 2-3 day at room temperature and then collect supernatant and solvent is evaporated by incubating at room temperature for 48hrs to make final volume 400mg/ml of curry leaves.

Determination of antimicrobial activity:

Paper distinction method used to evaluate antibacterial activity of different extracts of curry leaves. The disc made by using filter paper with 66mm diameter that was soaked in methanol and ethanol solution (15ml in each disc) with concentration 400mg/ml 200mg/ml, 100mg/ml and 50mg/ml each extract.

Statistical Analysis:

Each and every experiment was respected in triplicate sets and mean value of each set result were taken to represent the antibacterial activity of curry leaves extracts. All results were recorded as S (sensitive), I (intermediate sensitive) and R (resistant).

The results of sensitivity tests were expressed as (0) = (R) for no sensitivity, + for (below 6 mm) = (R) for low sensitivity, ++ (7- 12mm) = (I) for moderate sensitivity and +++ (13mm & above) = (S) for high sensitivity.

Result and Discussion:

In comparing the inhibition zones of *Staphylococcus* sp., *Streptococcus* sp. and *E. coli* on nutrient agar, the curry leaves (methanol) extract was more effective with *Streptococcus* sp. in producing a maximum of 38.0 ± 2.0mm inhibition (table-1, Figure-1) zone as compared to a maximum of 34.1±1.0mm inhibition (Table-2, Figure-2) zone for *Staphylococcus* sp. and to a maximum of 36.5±1.0mm (Table-3, Figure-3) inhibition zone for *E. coli*.

The 400mg/ml concentration produced the maximum inhibition zones for both bacteria which progressively reduced with further dilutions from 200 mg/ml to 50 mg/ml.

Table 1: Zone of inhibition (mm) for *Streptococcus* sp.

Concentration	Methanol	Ethanol	Aqueous solution
400 mg/ml	38.0 ± 2.0	37.0 ± 2.0	32.7 ± 1.0
200 mg/ml	33.2 ± 1.0	32.0 ± 1.0	26.5 ± 1.0
100 mg/ml	27.3 ± 2.0	27.1 ± 2.0	22.3 ± 2.0
50 mg/ml	22.1 ± 0.0	21.1 ± 0.0	18.1 ± 1.0

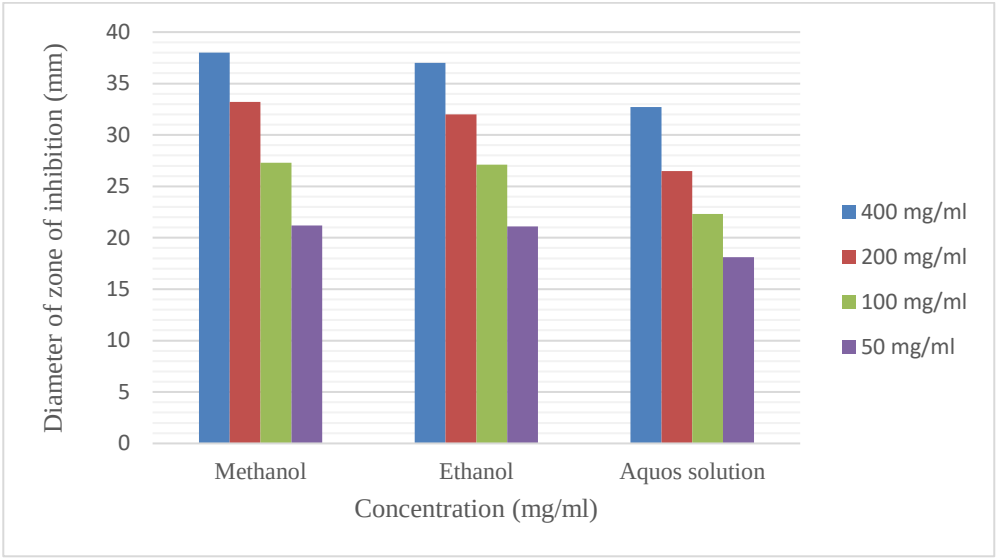

Figure 1: Zone of inhibition (mm) for *Streptococcus* sp.

Table 2: Zone of inhibition (mm) for *Staphylococcus* sp.

Concentration	Methanol	Ethanol	Aqueous solution
400mg/ml	34.1±1.0	32.3±1.0	27.5±1.0
200mg/ml	30.2±2.0	28.2±2.0	25.1±2.0
100mg/ml	26.4±1.0	24.1±1.0	22.5±1.0
50mg/ml	22.3±1.0	19.0+0.0	17.7±2.0

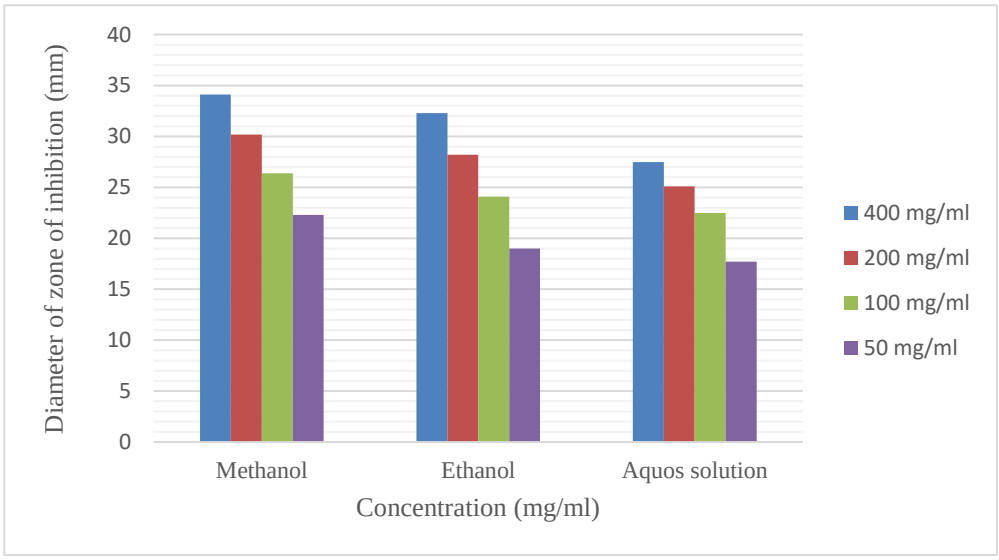

Figure 2: Zone of inhibition (mm) for *Staphylococcus* sp.

Table 2: Zone of inhibition (mm) for *E.coli*.

Concentration	Methanol	Ethanol	Aqueous solution
400mg/ml	36.5±1.0	33.1±1.0	29.1±1.0
200mg/ml	32.4±2.0	29.3±2.0	26.3±2.0
100mg/ml	27.1±1.0	25.1±1.0	23.5±1.0
50mg/ml	23.3±2.0	20.7±2.0	18.4±2.0

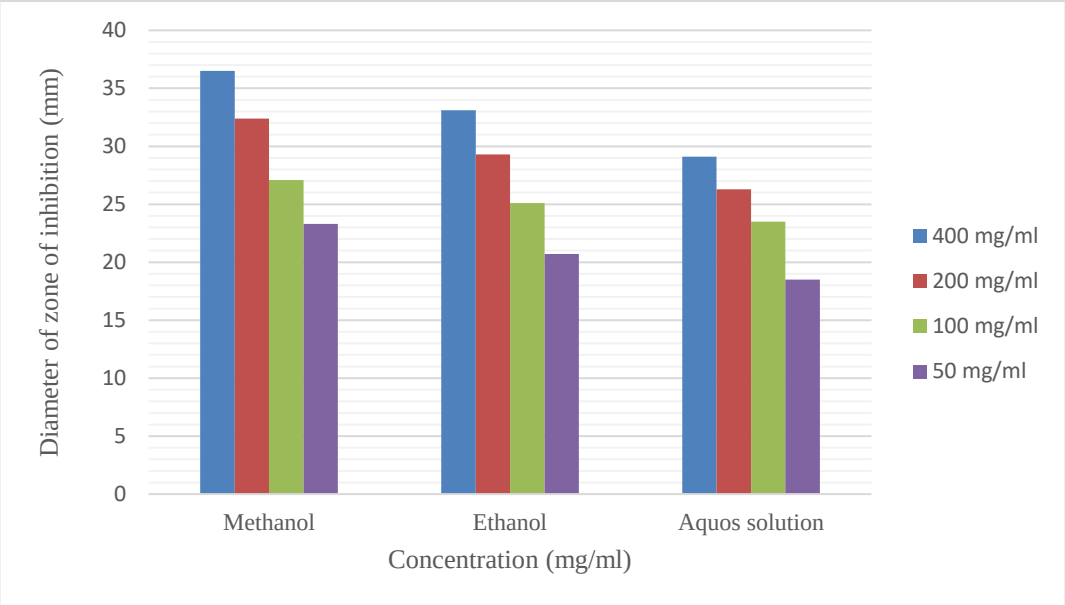

Figure 2: Zone of inhibition (mm) for *E. coli*.

Conclusion:

After evaluating it is shown that curry leaves are effective on *E. coli*, *Staphylococcus*, and *Streptococcus* sp. The ethanol and methanol extracts of curry leaves were found to be effect on all strains, except *Klebsiella pneumonia* and *Pseudomonas aeruginosa*. Curry leaves have potential to use as antibiotic against tested microbes. So, it could be effectively used in everyday meal for its beneficial aspects. This plant can be useful source of food industry and medicinal field. This research could be further extended to test the bioactive properties of curry leaves for therapeutic use.

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