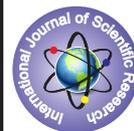


Antibacterial activity of *Murraya peniculata* Linn. (Rutaceae)



English

KEYWORDS: Antibacterial activity, extraction, inhibitory zone, *Murraya peniculata* Linn

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ABSTRACT

Murraya peniculata Linn is a medicinally important plant. The effect of its parts extracts is seen against six pathogenic bacteria, names are *Xanthomonas compestris* (-), *Pseudomonas mangiferae* (+), *Staphylococcus albus* (+), *Vibrio cholerae* (+), *Bacillus pumilus* (+) & *Bacillus subtilis* (-). Results several that all the extracts show positive antibacterial activity against all the tested organisms except flower extract which showed zero inhibitory zone against *Bacillus pumilus*. Thus *M. peniculata* can be considered as an important plant and a subject of further research.

Introduction

Murraya peniculata L. is an ornamental shrub belonging to the family Rutaceae. Different medicinal applications of its plant parts are well known. The powdered leaf is used on fresh cuts, the decoction of leaf is orally used to treat dropsy. The leaves are useful in the treatment of diarrhoea and dysentery.

The present study is an attempt to find medicinal value and antibacterial property of different parts of this plant. The extracts of different plant parts are tested against plant and human pathogenic bacteria. These extracts are found to be very effective against all the test organisms.

Review of literature indicates that various investigators have chemically screened this plant. (Kinoshita and Firman 1996, 97; Shrivastava and Shrivastava 1996 etc). Many workers have also studied the antibacterial activities on various other plants but very little work has been done on *Murraya peniculata*. (Khanna *et al.* 1980, Chile & Vyas 1984, Rankajlakshmi, Vanugopal *et al.* 1993). Nath 2015 & Dosoky 2016 on antibacterial activity of *M. Koenigii* (Mathur *et al.* 2010).

Material and Methods

Stem, leaves, flowers and fruits of material *Murraya peniculata* L are collected, washed and kept in oven at 55°C for three days. Dried material then, crushed in homogenizer and sample is powdered for the purpose of extraction.

Extraction: Petroleum ether extraction is done. 40 gm. of powdered material of plant parts is Soxhlet extracted with 200ml. of petroleum ether (B.P. 60-80°C) continuously for 18-24 hrs. The solvent is removed by distillation and the kept in refrigerator until used.

Antibacterial screening: Six pathogenic bacteria *Xanthomonas compestris* (-), *Pseudomonas mangiferae* (+), *Staphylococcus albus* (+), *Vibrio cholerae* (+), *Bacillus pumilus* (+) & *Bacillus subtilis* (-) are selected for screening in this study. The filter paper disc method (Gould and Bowie 1952) is used in screening the extracts for antimicrobial activity. Standard size Whatmann filter paper disc (6.0M) in diameter is sterilized by dry heat 140°C for one hour is saturated with the extract (0.04ml.) and the known quantity of standard reference antibiotics separately is air dried at room temperature to remove any residue solvent which might interfere in the determination. The disc is then placed on the sterilized nutrient Agar medium which has been inoculated with the test organism (using a sterile swab) and air dried to remove the surface moisture. The thickness of Agar medium is kept equal in all petri-plates. Control is run with 0.2 ml. of 1% HCl in method in place of sample extracts. Before inoculation petri-plates are placed in a cold room (5°C) for 1 hour to allow diffusion of the compound from the disc into the Agar plate. These are incubated at 37°C for 24 hours after which could be easily measured. Activity index is calculated for each.

Activity index AI = Inhibition of the sample / Inhibition area of control

Result and Discussions

Results are presented in histogram Fig 1 & Table I show interesting conclusions. All the plant part extracts showed positive activity against all tested bacteria. Best results shown by all plant parts against *Staphylococcus albus* where activity index (AI) is found to be maximum i.e. 1 or more than 1, while fruit extracts showed maximum (AI=1.99). Fairly good result is seen against *Pseudomonas mangiferae* by all the parts except stem extract i.e. AI (0.583), show AI more than 1 and maximum in leaf extract 1.25.

Stem extracts showed antibacterial activity in *X. compestris* (-) and in *Vibrio cholerae* (+) as AI for both the species is .933 and for *B. subtilis* .91 and *B. subtilis* maximum AI found is maximum 1.16 formed by leaf extract. Leaf and fruit extracts showed considerable antimicrobial activity against all organisms. (Fig. 1)

Against *B. pumilus* these extracts showed fairly good +ve inhibitory activity which more or less than 1 AI but strange while the growth of *V. cholerae* was inhibited by all the part extracts maximum by leaf extract AI=1.66.

The present study reveals that different parts of *Murraya peniculata* show a substantial antimicrobial activity against pathogenic both gram +ve and -ve bacteria growth.

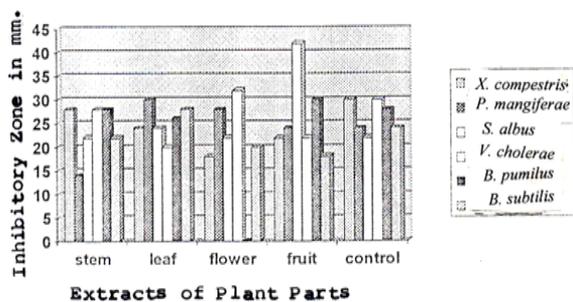
Table 1 Inhibitory zones shown by *Murraya peniculata* extracts against different pathogenic bacteria

S. No	Organism	Inhibitory zone (in M.M.)				
		Stem	Leaf	Flower	Fruit	Contro
1.	<i>Xanthomonas compestris</i> (-)	28	24	18	22	30
2.	<i>Pseudomonas mangiferae</i> (+)	14	30	28	24	24
3.	<i>Staphylococcus albus</i> (+)	22	24	22	24	22
4.	<i>Vibrio cholerae</i> (+)	28	20	32	22	30
5.	<i>Bacillus pumilus</i> (+)	28	26	00	30	28
6.	<i>Bacillus subtilis</i> (-)	22	28	20	18	24

Table 2 Activity indices of plant part extracts of *Murraya peniculata* on different bacteria

S. No	Name of Bacteria	Stem	Leaf	Flower	Fruit
1	<i>Xanthomonas compestris</i> (-)	.933	80	.60	.733
2	<i>Pseudomonas mangiferae</i> (+)	.583	1.25	1.16	1
3	<i>Staphylococcus albus</i> (+)	1	1.01	1	1.99

4	Vibrio cholerae (+)	.93	1.06	.66	.733
5	Bacillus pumilus (+)	1	.94	0	1.07
6	Bacillus subtilis (-)	.91	1.16	.83	.75



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