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A STUDY ON ANTIMICROBIAL ACTIVITY OF RUMEX VESICARIUS LINN

Panduraju.T *, Raja Sridhar Rao.P, Sateesh Kumar.V
St.Peter's Institute of Pharmaceutical Sciences, Vidyanagar, Hanamkonda.
E-mail: *pandurajurx100@yahoo.co.in*

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Abstract

Aim: To study the antimicrobial activity of aqueous, methanolic and petroleum ether extracts of leaves of *Rumex vesicarius* Linn.

Materials and Methods: The antibacterial activity was studied by agar cup plate method using nutrient agar media. The results were compared with standard Streptomycin (100µg/ml). The antifungal activity of the extracts was investigated by agar cup plate method using Sabouraud Dextrose Agar medium and the results were compared with reference Fluconazole (100µg /ml).

Result: All studied aqueous, methanolic and petroleum ether extracts have shown antimicrobial studies. The results of zone of inhibition study revealed concentration dependent nature of the extract with broad-spectrum activity against bacteria and fungi.

Conclusion: The present study enlightens the potential usefulness of *Rumex vesicarius* in the treatment of pathogenic diseases.

Keywords: Antibacterial activity, Antifungal activity, Rumex vesicarius Linn, Zone of inhibition.

1. Introduction

Rumex vesicarius Linn., (Family: Polygonaceae) known as “Bladder dock” or “Chukkakura” is an annual, glabrous herb, 15-30 cm in height, branched from the root, with long, elliptic, ovate or oblong leaves and monoecious flowers. The plant is widely cultivated as a vegetable in Tripura, Bihar, West Bengal and Andhra Pradesh. According to Unani system of Medicine, the herb is an analgesic, astringent, antiulcer, hepatoprotective agent and is useful in scabies, leucoderma, toothache, asthma, heart troubles, tumours and scurvy. The leaves are used as aperient, diuretic and considered as antidote for snake venom and seeds are considered as antidote for scorpion venom[1,2,4,6]. In the present study, we report the antimicrobial activity of aqueous, methanolic and petroleum ether extracts of leaves of *Rumex vesicarius*.

2. Material and Methods

2.1 Plant material

Rumex vesicarius plant material was collected from the local vegetable market, Hanamkonda, Warangal, (A.P), India. The plant parts are identified by Dr. Raju S.Vastavya, Taxonomist, Department of Botany, Kakatiya University, Warangal, India.

2.2 Preparation of extract

The fresh leaves are washed, ground to juice and macerated with distilled water, methanol and petroleum ether for 3 days. Then the solutions are filtered through a muslin cloth, the filtrate is airdried and the extract is obtained. The preliminary phytochemical analysis of prepared extracts indicated the presence of carbohydrates, anthraquinone glycosides, cardiac glycosides, saponin glycosides, flavonoids, tannins, steroids, cysteine, glutamic acid, proline, phenylalanine and histidine.

2.3 Drugs used

Streptomycin and Fluconazole were used as reference standards for antibacterial and antifungal studies respectively.

2.4 Microorganisms used

For the present study, the microorganisms used include gram positive bacteria *Staphylococcus aureus*, *Bacillus subtilis*, gram negative bacteria *Escherichia coli, Pseudomonas aerugenosa*, and fungal strains *Aspergillus niger* and *Curvilaria pallescens* [5]. Suitable strains of these microorganisms were procured from microbiology laboratory of Kakatiya University.

2.5 Antimicrobial activity

2.5.1 Determination of zone of inhibition [3,7,8]

The zone of inhibition was determined by performing agar cup-plate method for aqueous, methanolic and petroleum ether extracts of leaves of *Rumex vesicarius* and the concentrations used were 100mg/ml, 200mg/ml and 400mg/ml. Streptomycin(100µg/ml) and Fluconazole(100µg/ml) were used as reference standards for the antibacterial and antifungal studies respectively.

3. Results and Discussion

Table 1 depicts the antimicrobial activity of aqueous, methanolic and petroleum ether extracts of leaves of *R.vesicarius*. The results of zone of inhibition studies revealed that the methanolic extracts posses significant antimicrobial activity in a concentration dependent manner against the test organisms and was comparable with the standard drugs.

Table 1. Zone of inhibition (mm) of aqueous, methanolic and petroleum ether extracts of *Rumex vesicarius*

MICRO ORGANISMS	ZONE OF INHIBITION(mm)[a]									
	LEAF EXTRACTS(mg/ml)									Standards [b]
	Aqueous Extract			Methanol Extract			Petroleum ether Extract			
	100	200	400	100	200	400	100	200	400	
Gram positive bacteria										
Staphylococcus aureus	5	8	11	12	22	29	5	7	10	34
Bacillus subtilis	6	8	12	18	25	32	8	10	14	36
Gram negative bacteria										
Escherichia coli	6	8	12	10	19	26	6	9	11	36
Pseudomonas aerugenosa	6	9	13	17	22	30	7	11	15	36
Fungi										
Aspergillus niger	8	12	15	12	20	28	5	8	12	30
Curvilaria pallescens	6	10	16	10	18	26	6	10	14	31

[a] Values are mean of two readings (n=2)

[b] Standards: Antibacterial studies with Streptomycin(100µg/ml);Antifungal studies with Fluconazole(100µg/ml)

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Current Author Address:

Panduraju.T *,

St.Peter's Institute of Pharmaceutical Sciences,

Warangal Dist.