

PRELIMINARY PHYTOCHEMICAL AND ANTIMICROBIAL ACTIVITIES ON THE LEAVES OF

Naringi crenulata roxb

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ABSTRACT :

Ethanol extract of *Naringi crenulata* or *limonia crenulata* leaves was investigated for Phytochemical and Antimicrobial activities. The macroscopic characteristics of leaves, physical constant values, extractive values, behavior on treatment with different chemical reagents of the powdered leaves. *Naringi crenulata* were studied to fix some pharmacognostical parameters and preliminary phytochemical studies on ethanolic extracts of the leaves were also performed. Antimicrobial activities against two bacterial strains – *Bacillus subtilis*, *Klebsilla pneumoniae* and two fungal strains *Aspergillus niger*, *Mucor sp.* among the various leaf extracts maximum antimicrobial activity was exhibited by standard antibiotic.

Key words:

Naringi crenulata, Rutaceae, Phytochemical studies and Antimicrobial activities.

INTRODUCTION:

In the past several years, the rapid emergence of microbial resistance to antibiotics has been observed with the emergence of resistance genes to antibiotics of microbial origin. Plant materials used as folk medicine have become the objects of public alteration. Higher plants are untapped reservoirs of various chemicals awaiting intensive exploitation for their biological properties (Manjeet kaur and Soraj arora, 2000). *Naringi crenulata* Roxb (or) *Limonia crenulata* is a Rutaceae family, spinous glabrous small tree, grows tropical Africa and Asia. It is commonly known as “Mahavilvam” in Tamil. Leaves are given with milk to

children to cure the digestive disorders, remedy for epilepsy. The leaves are aromatic just like any other citrus leaves.

MATERIALS AND METHODS:

Mature and fresh leaves were collected, air-dried and pulverized and sieved through 40 mesh. The macroscopic characteristics of (colour, odour, size, shape, and taste, surface) the leaves were observed. The ash values of leaves were determined by pharmacopoeial methods (Indian pharmacopoeia, 1966). Preliminary phytochemical tests of ethanolic extract were performed using

specific reagent^{4,5} (Trease and Evans, 1985; Tyler *et al.*, 1985).

The powdered leaves were extracted with ethanol in a soxhlet apparatus. The extract was dried in a heated vacuum dissector and dried extract thus obtained was analysed for phytochemical and antimicrobial tests. The antibacterial activities of this extract were tested against *Bacillus subtilis*, and *Klesiella pneumoniae*. The antifungal activities of the extracts were tested against *Aspergillus* and *Mucor Sp*. The antibacterial and antifungal activity was checked by paper disc diffusion method. A standard disc containing *Ciprofloxacin* antibiotics was used as control standard.

RESULTS AND DISCUSSION:

The macroscopic characteristics are shown in Table 1. Physical constant values

like loss on drying, total ash value, acid insoluble ash value, alcoholic soluble extract and aqueous soluble extract are tabulated in Table 2. The extractive values obtained after successive extraction are given in Table 3. The benzene and methanol extracts show the minimum and maximum extractive value. The results of preliminary phytochemical tests. Alkaloids and tannin are higher in methanolic extracts. Fixed oils and fats are higher in petroleum ether extract, tannin and phenol content are higher in methanolic extracts. All the three extract do not contain flavanoid, steroid and saponin.

Antibacterial and antifungal activities of ethanolic extract of Naringi crenulata leaves were given in Table 5. It showed significant activity against all the bacterial and fungal pathogens.

Table1
Macroscopic characteristics of Naringi crenulata leaves

1	Colour	Fresh dark green and dried leaves are light green in colour
2	Odour	Aromatic
3	Size	Spines sharp, 1.2- 2.5 cm long leaves pinnate. 2.5- 10 cm ; petiole and rachis jointed. The former narrowly, the latter very broadly winged; leaflets 2-4 pairs.
4	Sharp	Trapezoid – ovate, obtuse rarely acute, notched at the tip, crenulate, glabrous, base cunate joints of rachis obovate oblong crenulate.

Table 2 Physical constants of *Naringi crenulata* leaves

S.No	Physical constants	Value
1.	Total ash	11.54-12.15%
2.	Acid insoluble ash	1.62-2.10%
3.	Alcohol (90%) soluble extractive	12.45-13.15%
4.	Water soluble extractive	11.25-12.10%
5.	Water insoluble extract	13.15-14.10%

Table 3 Extractive values of *Naringi crenulata* leaves

S.No	Solvent	Percent of extractive values	Colour of extractive
1.	Petroleum ether	3.10-3.40	Light green
2.	Benzene	0.50-1.12	Greenish brown
3.	Chloroform	1.05-1.25	Green
4.	Acetone	3.42-3.92	Deep green
5.	Ethanol	5.10-5.25	Greenish brown
6.	Methanol	5.21-5.65	Dark green

Table 4 Results of preliminary phytochemical tests for the presence of active constituents in *Naringi crenulata* leaves

S.No	Constituents	Extracts		
		Ethanol	Methanol	Petroleum Ether
1.	Alkaloid	++	++	-
2.	Flavonoid	-	-	-
3.	Steroid	-	-	-
4.	Saponin	-	-	-
5.	Tannin	+	++	+
6.	Phenol	++	++	+
7.	Carbohydrate	++	++	+
8.	Protein	++	++	-
9.	Amino acid	+	++	+
10.	Fixed oil & fats	-	+	+

Table 5. Antimicrobial activity of *Naringi crenulata* leaves

S.No	Organism used	Ciproflaxin 30µg/ml	Inhibition zone(mm)		
			10µg/ml	20µg/ml	30µg/ml
1.	Bacteria				
	<i>Bacillus subtilis</i>	28	20	22	23
	<i>Klebsiella pneumoniae</i>	27	21	23	25
2.	Fungus				
	<i>Aspergillus niger</i>	26	22	23	25
	<i>Mucor sp</i>	24	20	21	23

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