ISSN 2278- 4136
ZDB-Number: 2668735-5
IC Journal No: 8192
Volume 2 Issue 1
Online Available at www.phytojournal.com

Journal of Pharmacognosy and Phytochemistry

Phytochemical Screening, Antibacterial, Antifungal and Anthelmintic Activity of *Morinda citrifolia* Stem

CH. Kethani Devi[*1] and Dr. D. Gopala Krishna[2]

1. Department of Pharmacognosy, Narasarao Peta Institute of Pharmaceutical Sciences, Narasarao pet, Guntur-522601, Andhra Pradesh, India.
   [E-mail: kethanid88@gmail.com, Tel: +91 9493101093]
2. Department of Chemistry, KL University, Guntur-522502, Andhra Pradesh, India

In the present study, the Petroleum Ether and Alcoholic extract of *Morinda citrifolia L.* (Noni) stem were subjected to preliminary screening for Antimicrobial and Aanthelmintic activity. The alcoholic extract exhibited significant Anti-bacterial, Antifungal activity, comparable to the standard drug Tetracycline. The Petroleum Ether and Alcoholic extract were evaluated for Anthelmintic activity on adult Indian Earthworms, '*Pheretima posithuma'*. The Alcoholic extract produced more significant Anthelmintic activity than Petroleum ether extract and the activities are comparable with the reference drug Piperazine citrate.

Keyword: Antimicrobial, *Morinda citrifolia*, Anthelmintic, Tetracycline, Piperazine citrate.

1. Introduction

Since the time immemorial, our traditional system of medicine and folklore claiming that medicinal plant as whole or their parts are being used in all types of skin diseases successfully including Anti-bacterial and Antifungal. Parasitoses have been of concern to the medical field for centuries and the helminthes still cause considerable problems for human beings and animals. The most of the medicinal preparation now a day available in the market are either not effective up to the mark or has developed resistance resulting in reoccurrence again. Plant derived drug serve as prototype to develop more effective and less toxic medicines. The plant *Morinda citrifolia L.* (Noni) (Rubiaceae) has been used in folk remedies by Polynesians, Indians for over 2000 years and is reported to have a broad range of therapeutic effects, including Antibacterial, Antiviral, Antifungal, Antitumor, Analgesic, Hypotensive, Anti-inflammatory and Immune enhancing effects[1].

A survey of literature revealed that no methodical reports on Anti-bacterial, Anti-fungal and Anthelmintic activity of various extracts of *Morinda citrifolia L.* (Noni) stem are available. Therefore it was thought worthwhile to explore this indigenous plant for its activity against different microorganisms.

2. Materials and Methods

2.1 Plant Material: Leaves of *Morinda citrifolia* L (Noni) were collected from Nallamalla forest and Tirupathi, valleys, Andhra Pradesh in the month of December. The plant was identified, authenticated and a voucher specimen was kept in

the herbarium of Department of Pharmacognosy, Institute of Pharmaceutical sciences, Narasarao pet, Andhra Pradesh.

2.2 Extract Preparation: The stems were collected and washed thoroughly in water, chopped, air dried for a week at 35-400 C and pulverized in electric grinder. 150 gm. of the powder subjected to Soxhlet apparatus using solvents such as Petroleum ether and Alcoholic extract. The solvent was then removed under reduced pressure, which obtained a greenish-black colored residue. The yield was 9.4% and 7.9% respectively. The prepared extracts are used for the Antimicrobial and Anthelmintic activity.

2.3 Experimental Design

2.3.1 Anthelmintic Activity Study: The Anthelmintic activity was done on adult Indian earth worm'Pheretima posithuma' due to its Anatomical and Physiological resemblance with the intestine round worm parasites of human beings[2,3].

2.3.2 Study Protocol: Four groups of approximately equal size earthworms consisting of six earthworms in each group were used for the present study.

- **Group-1** Control (Normal saline)
- **Group-2** Standard (Piperazine citrate-10mg/ml)
- **Group-3** Pet. ether extract of different concentration (10 mg/ml, 50 mg/ml, 100 mg/ml)
- **Group-4** Alcoholic extract of different concentration (10 mg/ml, 50 mg/ml, 100 mg/ml).

Observations are made for the time taken to paralysis and death in individual worms. Paralysis was said to occur when the worms do not revive even in normal saline. Death was concluded when the worms lost their motility followed with fading away of their body colour[4,5].

Table 1: Anthelmintic Activity of *Morinda citrifolia* L. (Noni) leaf extract.

Group 1st Control	Treatment (Normal saline)	Con. (mg/ml)	Paralysis time (min.)	Death time (min.)
2nd	Piperazine citrate	10	20.5±0.7 10	26.4±0.5 100±2.7 90.5±1.6
3rd	Petroleum ether Extract	10 50 100	90.3±1.7 50 70.2±1.5 57.3±1.0	100±2.7 50 70.2±1.5 90.5±1.6
4th	Alcoholic Extract	10 50 100	86.3±1.9 67.8±1.5 40.0±0.9	90.5±1.0 80.3±2.0 50.3±0.8

2.4 Anti-microbial Study:

2.4.1 Micro Organisms: Three strains of *E. Coli, Bacillus Subtilis*, Staphylococcus aureus were used for assessing the Anti-microbial activity standard Tetracycline (10mg/ml). Two fungal strains *Asperigillus niger* and *Candida albicans* were used for Anti-fungal activity. The microorganisms were obtained from the Department of Biotechnology, KL University Guntur, Andhra Pradesh, India.

2.4.2 Study Protocol: Antimicrobial activity was determined by Disc Diffusion method. Muller Hinton and Saboured Dextrose Broth are used as medium for bacterial and fungal strains respectively[6,7] Positive control experiment was carried out under the similar condition by using Tetracycline (10mg/ml). The petridishes with the bacterial and fungal cultures were incubated at 37±2 ^{0}C for 24 hrs and 27±2 ^{0}C for 48 hrs respectively. The assessment of Anti-microbial activity was based on the measurement of diameter of inhibition zone formed. The experiment was repeated

thrice and the results were taken as mean of three readings[8,9].

3. Results and Discussion

From the Anthelmintic activity study, the Alcoholic extract at a dose of 100 mg/ml has significant Anthelmintic activity whereas Petroleum ether showed moderate activity. (Table-1) The results of Antimicrobial activity of Petroleum ether and Alcoholic extracts of *Morinda citrifolia L.* (Noni) were studied and it was found that Alcoholic extract of 10 mg/ml produced potent Antimicrobial activity as it shows inhibitory zone as compared to other individual concentrations of Petroleum ether. The activities are comparable with the reference drug Piperazine citrate. (Table-2).

Table 2: Anti-microbial activity of *Morinda citrifolia* L. (Noni) Report

Treatment	Concentration	Diameter of Zone of Inhibition (cm.)				
		Bacteria			Fungi	
M. citrifolia **Pet. Ether extract**	5mg/ml	1.7	2.0	1.7	2.0	2.5
	10mg/ml	1.9	2.1	1.8	2.2	2.6
M. citrifolia **Alcoholic extract**	5mg/ml	1.9	2.1	1.8	2.0	2.7
	10mg/ml	2.0	2.4	2.1	2.5	2.9
Standard Tetracycline	10mg/ml	2.1	2.5	2.3	2.9	3.3

4. References

1. WANG Mian-Ying et. al., Morinda citrifolia (Noni): A literature review and recent advances in Noni research. Acta Pharmacol Sin. 2002; 23:1127–1141
2. Vigar Z. Atlas of Medical Parasitology, 2nd Edn. Publishing House, Singapore, 1984; 216-218
3. Vidyarthi R.D., A Test book of Zoology 14th Edn., Chand and Co., New Delhi, 329 331.
4. Qureshi Md. Shamim et. al. Anthelmintic activity of Smilex zeylanica leaf. Research J. of Pharmacognosy and Phytochemistry, 2009; 1: 78-79.
5. Dwivedi S. *et. al*. Anthelmintic activity of alcoholic and aqueous extract of fruits of Terminalia chebula, Ethno. Leaflets, 12: 741-743.
6. Chakraborty G.S. et al. Anti-microbial activity of Chlorophytum borivilianum leaves, Indian Drugs, 2009; 46: 579.
7. Trapti Rastogi et. al. Studies on Antimicrobial activity of Boswellia serrata, Moringa oleifera and Vitex negundo: A comparison. Research J. of Pharmacognosy and Phyto chemistry. 2009; 1: 75-77.
8. Sherad *et.al.* Phyto chemical Investigation and anti-microbial and anthelmintic activity of Solanum xanthocarpum. Adv. Pharmacol. Toxicol, 2008; 9: 45- 49.
9. S. Kumar Raja *et. al.* Anti-bacterial activity of ethanolic extract of roots of Caesalpinia pulcherrima. Adv. Pharmacol. Toxicol, 2008; 9: 37-38.