



Research article

## Purification, extraction of semecarpus anacardium by traditional method and evaluation of antibacterial activity

Parijatha Bandigari\*, Ashok Dongamanti

Osmania University, Hyderabad, Telangana, India

**ABSTRACT**

In Indian system of medicine marking nut is one among the medicinal plants used to cure many diseases like inflammation, piles, and cancer. In this method marking nut extraction is done by using simple traditional method without using solvent. This method is completely free from chemical effect. The antimicrobial activity of the extract was determined by Agar Disc diffusion method against Gram positive and gram negative bacteria. MIC values about Staphylococcus aureus, Escherichia coli, Lactobacillus were 10, 20, and 40 mg/ml respectively. This study can provide information for the future research to determine antimicrobial activity.

**Keywords:** Marking nut, Traditional method and Antimicrobial activity

Received - 25-06-2021, Reviewed - 20/07/2021, Revised/ Accepted- 04/09/2021

**Correspondence:** Parijatha Bandigari\* ✉ [parijatha.pharmacy@gmail.com](mailto:parijatha.pharmacy@gmail.com)

Osmania University, Hyderabad, Telangana, India

**INTRODUCTION**

Every plant or herb in the world has some medicinal property. Hence every plant would help in regulating the functions of body and enhancing the good health. Many medicinal plants/herbs are mostly used as powerful resources of vitamins, minerals and for treatment that can provide substantial benefits. In addition to this, the herbs are inexpensive and easily available. Herbs, due to their efficacy as medicine or remedy to replace modern medicine and their adverse effects. Modern medicines consist mostly of antibiotics and chemotherapeutic drugs, which are employed to kill bacteria responsible for causing diseases or dysfunctioning of organs<sup>[1]</sup>. These drugs not only kill bacteria or pathogens but many a times their prolonged use induces drug resistance in pathogens. So, there is a necessity for an alternative and effective system of medicine, which not only cures diseases, but also preserves and promotes health. With this respect, use of herbs and medicinal plants plays a prominent role, since they are considered to enhance the resistance without producing side effects<sup>[2]</sup>.

**Plant introduction**

Bhallataka is used for curing different diseases and for longevity. It is popularly used in tribal as well as rural areas of the country. Bhallataka, due to its utility and highly medicinal properties, is popularly known as 'Ardha Vaidya' (multi-purpose medicine), it is a Sanskrit name for Semecarpus anacardium Linn. A plant from

'Anacardiaceae. It is used in treatment of piles, skin diseases and cancer treatment<sup>[3]</sup>. This plant is used only after purification procedures because of its hot potency nature. Chemical analysis reveals that it contains phenolic compounds, Bhilawanol, bioflavonoids, minerals, vitamins and amino acids<sup>[4]</sup>.

Figure 1: marking nut plant

**MATERIALS AND METHODS****Collection of drug**

Dried nuts of the plant were collected from the local market at Hyderabad, Telangana, India. The nuts were authenticated by the Department of Botany Osmania University, Hyderabad.

**Sample selection**

The dried nuts were mixed thoroughly and sample was selected randomly.

### Equipment's for Extraction

Two naturally prepared clay pots, wire mesh used for processing of the nuts.

### Microorganisms tested

Microorganisms studied in this project include *Staphylococcus aureus*, *Escherichia coli*, *Lactobacilli acidophilus*, and streptococci.

### Purification of Plant material

The selected nuts were taken and cleaned by using cotton cloth. Seeds contains corrosive property so which were soaked in milk for overnight, then after removed from milk and dried under sun light. Completely dried nuts used for extraction<sup>[5]</sup>.

### Plant material Extraction

It was a completely natural extraction process it does not requires any solvent for extraction. South Indian people mostly Palm climbers (Toddy toppers) use this method to prepare Marking nut extract. Palm climbers mainly apply this Marking nut extract to Palm trees to prevent the black and white ants attack to the palm tree and palm wine<sup>[6-7]</sup>.

Figure 2: Extraction process of marking nuts



It is a natural method it requires no harmful chemicals or reagents and no metal based vessels for extraction process. This process requires only two pots and Dung cakes. For extraction process the selected area was dugged up in to half meter and placed one pot inside the dugged area then the surrounding area was filled with sand. In another pot marking nut seeds were taken it was placed upside down on the dugged pot, in between the two pots wire mesh was placed<sup>[8]</sup>. The gap between the two pots sealed with wet clay to prevent leakage of extract. Flame supplied to the seeds by using dung cakes. The flame passed to the seeds and melted inside the pot. The melted extract passed to the underground pot through the mesh. The process was continued for three hours. After three hours the flame was removed and kept it for next day morning. The crude extract which was present in the down pot was collected<sup>[9]</sup>.

### Phytochemical Screening

For the Preliminary Phytochemical screening (8), the extract was tested for different phytochemicals by using standard procedure.

### Antimicrobial activity Determination

Disc diffusion method helped for screening of antimicrobial

activity of marking nuts extract. The test material impregnated with the sterile filter paper discs and placed on the inoculated plates aseptically<sup>[10]</sup>. Standard drug used was Ampicillin. Zones of inhibition were observed after 24 - 48 h incubation around the discs.

### Minimum inhibitory concentration (MIC) Identification

The test material (40, 20, 10, mg/ml marking nuts extract) added to the sterile Muller Hilton the final preparations were poured into sterile Petri plates and kept a side for half an hour. The plates were then inoculated with the samples of microorganisms<sup>[11]</sup>.

## RESULTS AND DISCUSSION

### Observations on Phytochemicals

Phytochemical observation study gives positive for carbohydrates, alkaloids, sterols, phenolic compounds, tannins, proteins and amino acids.

Table.1: Observation on Preliminary Phytochemicals

PHYTOCHEMICAL ANALYSIS	OBSERVATION
Alkaloids	-
Carbohydrates	+
Proteins	+
Steroids	+
Phenols	+
Tannins	-
Flavonoids	-
Glycosides	-
Saponins	-
Terpenes	+
Amino acids	+

Key (+) =Presence, (-) =Absence

### Antimicrobial activity

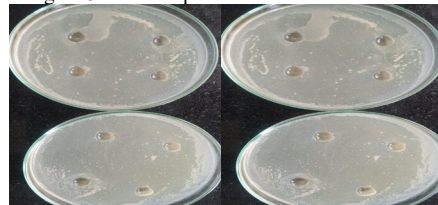
Marking nuts extract showed antimicrobial activity against tested microorganisms at the concentration of 10,20 and 40 mg/ml concentration respectively.

### Table of Results

Table.2: Dose response and MIC of the extract.

		Inhibition		
Concentration(mg/ml)		<i>E. coli</i>	<i>S.aureus</i>	<i>Bacillus</i>
<b>Test</b>	10(mg/ml)	5	10	0
<b>Test</b>	20(mg/ml)	10	15	0
<b>Test</b>	40(mg/ml)	15	20	10
<b>Standard</b>	10(mg/ml)	6	12	5
<b>Standard</b>	20(mg/ml)	12	16	10
<b>Standard</b>	40(mg/ml)	18	22	12

Figure.3: Dose response and MIC of the extract



## DISCUSSION

Now a days the major problem with the antimicrobial drugs are development of antimicrobial resistance because of its over use. To overcome this problem use of medicinal plants is the best way, which provide huge source for many antimicrobial agents. Extract prepared by natural heating method and the MIC values of the extract was determined against different microorganisms. Marking nut extract has antibacterial effects at the concentrations of 10, 20, and 40 mg/ml respectively.

## CONCLUSION

The data reveals that traditional method of purification and extraction of Bhallataka fruits definitely reduces the irritation. Extract prepared by natural heating method and its inhibitory effect on bacteria were investigated. This study will be helpful for the future studies to quantify the individual components and their effects.

## ACKNOWLEDGMENT

We Acknowledge Dr. D. Ashok, UGC-BSR faculty fellowship, New Delhi. [Sanction No. F. 18-1/2011(BSR)]

## REFERENCES

1. Ilanchezian Rangasamy, 2014. Shodhana (purificatory procedures) of Bhallataka (*Semecarpus anacardium* Linn) fruit by traditional frying method / Asian Journal of Traditional Medicines 9(1).
2. Sastry JLN Dravyaguna vijnana, 2008, Vol-2, 3rd ed, Varanasi: Chaukhamba Orientalia 135.
3. Ilanchezian R, Roshy Joseph C, Acharya RN, 2011. Pharmacognostical and Physicochemical Analysis of Bhallataka (*Semecarpus anacardium* Linn) – Fruit, Pharmacog J, 3: 9-16.
4. Govind Das, Bhaishajyaratnavali, Ambikadatta sastry, 2001. Editor, Varanasi: Chaukhambha Sanskrita Samsthan 610: 685-686.
5. Samhita C, Trikamji J, editor, 4th ed, 1994. Varanasi:Chaukhamba Sanskrit Sansthan 377-383.
6. Ramasastry BV, Shenolikar IS, 1974. Nutritive value of two unusual foods: Adda (*Bauhinia vahilii*) and marking nut (*Semecarpus anacardium*) kernels, Ind J Med Res, 62: 1673-1677.
7. Sharma S, Rasatarangini, Kasinath satri, editor, 11 th ed, 2004. New Delhi: Motilal Banarasidas 478-479.
8. Lohar DR, Legal status of Ayurvedic, Siddha & Unani medicines, Ghaziabad: Department of AYUSH Ministry of Health & Family Welfare, p72.
9. Ilanchezian R, Roshy JC, Acharya R, 2010. Importance of media in shodhana (purification/Processing) of poisonous herbal drugs, Anc Sci Life, 30: 27-30.
10. Patwardhan B, Saraf MN, David SB, 1988. Toxicity of *Semecarpus anacardium* extract, Ancient Sci Life 8: 106-109.
11. Naidu DS, 1925. Constituents of the marking-nut: *Semecarpus anacardium* Linn, Journal of Indian Institute of Science 8: 129-142.

### How to cite this article

Parijatha Bandigari, Ashok Dongamanti, 2021. "Purification, extraction of *semecarpus anacardium* by traditional method and evaluation of antibacterial activity". Jour. of Med. P'ceutical & Allied. Sci. V 10 – I5, 1430, P- 3633-3635. doi: 10.22270/ jmpas.V10I5.1430