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ANTIFUNGAL & ANTIMICROBIAL ACTIVITY OF *BARRINGTONIA ACUTANGULA* (LINN) GAERTN. FRUIT.

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ABSTRACT

A crude drug is any naturally occurring, unrefined substance derived from organic or inorganic sources such as plant, animal, bacteria, organs or whole organisms intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in humans or other animals. Medicinal plants have curative properties due to the presence of various complexes. The plant *Barringtonia acutangula* is commonly called as Samundarphal or Indian oak belonging to the family Myrtaceae. The present study is carried out in detail to complete the antimicrobial evaluation of the crude drug using *Klebsiella pneumonia*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Escherichia coli* & *Saccharomyces cerevisiae*. The study will provide an insight into the antimicrobial activity of the crude drug which can be used as medicine.

KEYWORDS: *Barringtonia acutangula* fruit, antimicrobial, antifungal, *Aspergillus niger*, *Candida albicans*, *Saccharomyces cerevisae* & *Bacillus cereus.*

INTRODUCTION

Fruits of *Barringtonia acutangula*

The plant *Barringtonia acutangula* belongs to family Myrtaceae. The fruit of *Barringtonia acutangula* has ellipsoid to ovoid berries, fibrous, bluntly quadrangular, truncate at both ends and each berry bears one ovoid black seed. (Hooker 1883).

Vernacular Names- Sanskrit - Hijjala; Hindi - Hijagal, Assamese - Hendol, Hinyol, Pani amra; Kannada - Mavinkubia, Niruganigily, Dhatripala; Malayalam - Attampu, Attupelu, Nir perzha. (Kapoor, 1990).

The active constituents in the fruits are barringtogenol D, C and B, saponins and barringenic acid. Seeds contain triterpenoid glycosides, barringtogenin. (Joshi, 2000).

The fruits are bitter, coolant, acrid, astringent to the bowels & used in nasal catarrh and hallucinations, diuretic, expectorant, intestinal worms, wounds, ulcers, skin diseases, leprosy, cough, intermittent fever etc. Seeds are very warm and dry and are used as an aromatic, carminative and emetic, with juice of ginger used in catarrh of the nose and respiratory passages; applied to chest to relieve pain and cold; to the abdomen to relieve colic and flatulence. (Drury, 1873; Sala, 1994).

The antimicrobial activity of *Zizyphus jujuba* has been studied by Vaidya, 2016. Antifungal & antimicrobial activity of *Zizyphus jujuba* has been studied by Vaidya et al., 2016. Antimicrobial activity of aqueous & methanolic extract of young and mature leaves of *Psidium guajava* (Guava) by Vaidya, 2013. Antimicrobial activity of *Helicteris isora* has also been observed by Vaidya, 2015 & the present study was undertaken to study the antifungal as well as antimicrobial activity of its fruit. Antimicrobial activity of *Eclipta prostrata* has already been studied by Vaidya & Sambhare, 2016. Vaidya, 2015, has studied antimicrobial activity of *Holarrhena antidysenterica* in the recent past.

MATERIALS AND METHODS

The plant material i.e. leaves and fruits of *Barringtonia acutangula* for the present work was collected from Vile Parle and Victoria garden (Byculla) & authenticated. The standard cultures from NCIM were used of *Aspergillus niger*, *Candida albicans*, *Saccharomyces cerevisae* & *Bacillus cereus.* All the cultures were grown at 37°C and maintained at 4°C on nutrient agar slants.

For preparation of extract 10 gm of powdered *Barringtonia acutangula* fruit was mixed with 100 ml of methanol solvent & kept for 24 hours. By this process, the active compounds

present in sample are also found in methanol. The mixture was then filtered using Whatman No. 1 filter paper. The filtrate was then re-suspended in distilled water and was stored in refrigerator for further use.

Agar cup method

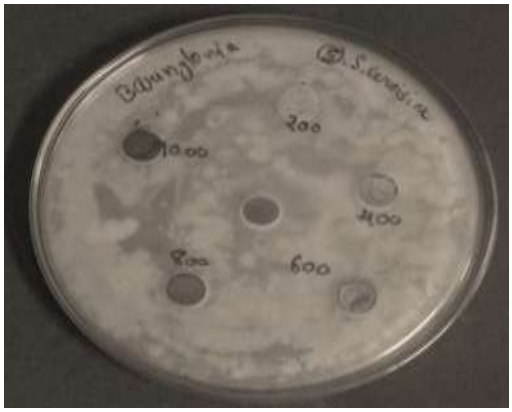
The agar cup method was used to study the antibacterial activity of the extracts. Culture from culture plates was scooped using a wire loop and separately mixed with normal saline. A loopful was withdrawn and was mixed with the agar broth and then was poured in petriplate until the agar solidified. Wells of approximately 6mm in diameter and 2.5mm deep were made on the surface of the solid medium using a sterile borer. The extracts were inoculated in the well having the concentration 200,400, 600, 800 & 1000 µg/mL. Solvent blank was also inoculated. The plates were incubated at 37°C for 24 hours. After 24 hours, the plates were removed and zones of inhibition measured and the results were tabulated. Extracts with zone of inhibition greater or equal to 7mm diameter were regarded as positive.

Sr. No	Name of organism	Blank (DMSO)	200 (ppm)	400 (ppm)	600 (ppm)	800 (ppm)	1000 (ppm)
1.	*Aspergillus niger*	-	10	12	13	13	13
2.	*Candida albicans*	-	10	10	11	11	12
3.	*Saccharomyces cerevisae*	-	9	10	10	11	12
4.	*Bacillus cereus*	-	11	12	12	13	13

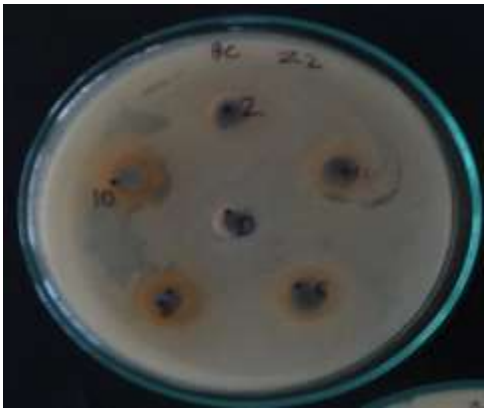
- indicates no growth, zone of inhibition in mm.

Aspergillus niger

Candida albicans



Saccharomyces cerevisae



Bacillus cereus

DISCUSSION

The antifungal & antimicrobial activity shows maximum activity in 1000 ppm concentration. The activity is seen in 200, 400, 600 & 800 ppm also. Thus confirming that the plant has antimicrobial properties. Hence it is possible that the fruit can be used as an antifungal & antimicrobial source. With an increased use of plant drugs in the future *Barringtonia acutangula* fruit can also be.

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