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Antifungal Activity of Malvastrum Coromandelianum Leaf Extracts

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ABSTRACT

Malvastrum coromandelianum belongs to the family Malvaceae, commonly known as false mallow. Ethnobotanical survey revealed that it is used to treat various disorders. A previous study discussed the anti-inflammatory activity of the M. coromandelianum ethyl acetate extract was observed by *In-vitro* protein denaturation method. The aim of the current study was to research possible *in-vitro* Malvastrum coromandelianum extracts antifungal mechanism. The antifungal role of Malvastrum coromandelianum can be confirmed by the observed results by its zone of inhibiton.

Keywords: Malvastrum coromandelianum, Antifungal activity, C. albicans, A. Niger

I. INTRODUCTION

Herbal medicines have received more attention in recent times due to their diversity in curing diseases, safety and well-tolerated remedies compared to conventional medicines[1]. Malvastrum coromandelianum belongs to the Malvaceae family, which has been famous for its medicinal properties for many years[2]. Because of the presence of alkaloids, essential oils and phenolic quleoside the plants of this family are well known for their antibacterial and antifungal activities. Phytochemical screening of the extracts revealed the presence of alkaloids, saponins, flavonoids, triterpenes, tannins and steroids. This study aimed to investigate pharmacological properties of the extract, including antifungal action[3-4].Microwave extraction has proved to be more effective and efficient than its conventional counterpart, the soxhlet extraction method. The Soxhlet extraction, which is a standard technique, is a continuous solvent extraction method[5-12]. Extraction systems are used to conduct routine solvent extractions of soils, sediments, sludge, polymers and plastics, pulp and paper, biological tissues, textiles and food samples[13-26]. Experiments have proved that microwaves, in comparison with the soxhlet extraction, use a lesser volume of solvent and sample and perform extraction at a much faster rate. In the discovery of effective medicines for prevention and treatment, an outbreak of coronavirus disease (COVID-19) caused by the novel extreme acute respiratory syndrome coronavirus-2 (SARS-CoV-2)

poses an unprecedented obstacle. The proximity to the patient during dental care, high generation of aerosols, and the identification of SARS-CoV-2 in saliva have suggested the oral cavity as a potential reservoir for COVID-19 transmission. Mouthwashes are widely-used solutions due to their ability to reduce the number of microorganisms in the oral cavity. Given the rapid pace of scientific research and clinical data provided by the large number of people who are rapidly infected with SARS-CoV-2, clinicians need reliable evidence of good medical care for this infection, as it is simple to do in-silico analysis in the initial stage with the aid of molecular docking software with help of chemical structure of compound. It is necessary to enhance both enzymatic stability and membrane permeation in the formulating drug delivery system for protein and peptide drugs. Soon, someday, you might be making your own drugs at home. That is because researchers have adapted a 3D printer from basic, readily available medicinal active agents fed into a drug delivery system[27-38].

II. MATERIALS AND METHODS

Plant Material

Malvastrum Coromandelianum was obtained from Kasegaon, Sangli, Maharashtra, India. The plant was identified and authenticated by department of botony, Yashwantrao Chavan College of Science, Karad.

Preparation of Plant Extract

Shade drying was done for almost a month as to avoid chemical degradation due to sunlight. Grinding of the dried material was done, with the aid of a grinder and converted into coarse powder. Extraction of Malvastrum coromandelianum was done by microwave extraction further filtered and excess solvent present was evaporated and dried extract were collected and subjected for activity studies.

Antifungal Activity:

Preparation of Sabouraud broth slants and sub-culturing of microorganisms

The inclinations of Sabouraud agar were set up by using agar 500 mg, 250 mg of peptone, Glucose 500 mg was broken down in 50 ml of water, then bubbled and laters poured into the test tube and then 15 minutes sterilized into the autoclave at (121^0C). After cleaning, the cylinders containing the Sabouraud agar were kept in a slanted position for ½ hours. At that point, on the strong surface of these inclinations, the culture of the test growths, e.g. candida albicans and aspergillus niger was streaked in aseptic condition and then brooded at 37^0C for 24 hours.

Preparation of culture media for antifungal sensitivity test

Agar 20gm, glucose 20gm, peptone 10gm in 1000 ml bubbling refined water and blending well was dissolve setup of Sabouraud agar pH (5.4). This was then sterilized for 15 minutes in an autoclave at 15 lbs (121^0C). The media were cooled down to 45^0C after sterilization and then aseptically poured onto sterile petri dishes. Every plate was spilled about 20-25 ml of medium. The plate media were allowed to harden at room temperature.

Inoculation of suspension of fungi on culture media

The institutionalized inoculum (turbidity so well-balanced as to achieve the intersecting growth of the petri plate) has been dunked into sterile, cotton swab and then the entire agar surface of the plate has repeatedly been streaked with swab, turning the plate to 60° between spreading. The streaked inoculums were then allowed to dry with cover for 5-15 minutes.Bore was punched on the ready plate by using clean (8 mm) well. With the help of a clean micropipette, fluconazole was stacked per bore for 100µl portion of the combined arrangement of nanoparticles and standard medicine. The plates were kept for 30 minutes at room temperature and then

hatched for 24 hours at 37^{0}C. With the aid of mm scale, the width of the zone of inhibition areas was measured[39-42].

III. RESULTS AND DISCUSSION

The antifungal assay was performed and resultsis shown in (Table 2). Malvastrum coromandelianum ethyl acetate extract showed significant activity against against C. albicans and A. niger.

Table 2: Zone of inhibition of Malvastrum coromandelianu ethanolic and ethyl acetate extract against selected microbial strains

Test subs	Concentration	Zone of inhibition	
		C. albicans	A. niger
Ethyl acetate extract	10 µg/ml	8mm	11 mm
	25 µg/ml	9 mm	18 mm
	50 µg/ml	16 mm	22 mm
Ethanolic extract	10 µg/ml	7mm	9 mm
	25 µg/ml	8 mm	15 mm
	50 µg/ml	15 mm	18 mm
Std.(Fluconazole)	10 µg/ml	9 mm	11 mm
	25 µg/ml	10 mm	16 mm
	50 µg/ml	18 mm	20 mm

IV. CONCLUSION

In current study in-vitro results confirmed the reported antifungal activity of M. Coromandelianum. Over the last decade fungal infections are increasing at an alarming rate. This is increase in incidence of fungal infections posses a great challenge to healthcare professionals. As performing fungal activity on different fungal species found that M. Coromandelianum has significant antibacterial activity.

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