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ORIGINAL ARTICLE

Evaluation of Antifungal Potential of Different Extracts of *Moringa Oleifera*

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ABSTRACT

The antifungal activity of different extracts of Moringa oleifera were tested against plant pathogenic fungi Rhizopus stolonifer and Microsporum gypseum by disc diffusion method. The plant leaves were extracted with various solvents like methanol, aqueous. Among the different extracts tested, the methanolic extracts showed maximum antifungal activity against.

Key words: *Antifungal, Medicinal plants, Moringa Oleifera*

INTRODUCTION

Concern has been expressed about the rising prevalence of pathogenic microorganisms which are resistant to the newer (or) modern antibiotics that have been produced in the last three decades (Cohen, 1992; Nascimento et al., 2000). Also, the problem posed by the high cost, adulteration and increasing toxic side effects of these synthetic drugs coupled with their inadequacy in diseases treatment found more especially in the developing countries cannot be over emphasized (Shariff, 2001). Coincidentally, the last decade has also witnessed increasing intensive studies on extracts and biologically active compounds isolated from plant species used for natural therapies or herbal medicine (Nascimento et al., 2000; Rios and Recio, 2005). Medicinal plants represent a rich source of antimicrobial agents. Plants are used medicinally in different countries and are a source of many potent and powerful drugs (Srivastava et al., 1996). A wide range of medicinal plant parts is used for extract as raw drugs and they possess varied medicinal properties. The different parts used include root, stem, fruit, twigs exudates and modified plant organs. While some of these raw drugs are collected in small quantities by the local communities and folk healers for local used, many other raw drugs are collected in larger quantities and traded in the market as the raw material for many herbal industries (Uniyal et al., 2006). Although hundreds of plant species have been tested for antimicrobial properties, the vast majority of them have not been adequately evaluated (Balandrin et al., 1985).

*M. oleifera*tree is also known as a 'Miracle tree' as almost every part of this tree possess products useful for humans. The leaves and pods are eaten. The plant is also reported to be medicinally important and almost all parts of the *M. oleifera*tree are considered to possess medicinal properties and are used in the treatment of ascites, rheumatism and venomous bites and as cardiac and circulatory stimulant (Shindano and Kasase, 2009). Leaves are also known to have anti-oxidant properties and are known to cures hallucinations, dry tumors, hiccups and asthma (Mehta and Agrawal, 2008). The root and bark are useful in treatment of heart complaints, eye diseases, inflammation, dyspepsia, and enlargement of spleen. The flowers are known to cure inflammations and muscle diseases. Seed oil is known to be useful in treatment of leprous ulcers Fahey (2005).

During recent years, considerable work has been done to investigate the pharmacological actions of the leaves and seeds of *Moringa oleifera* on scientific lines. But only limited work has been reported so far on antifungal activity of *Moringa oleifera* leaves and bark. Therefore, it was considered worthy to investigate the antifungal activity of *Moringa oleifera* leaves bark.

PLANT MATERIALS

For conducting the present study, the plant material was collected from different locations of Agra and Plant parts (bark) devoid of contaminant parts were carefully collected and kept in polythene bags which were then subsequently sealed. The stored specimens were thoroughly washed with tap water. They were shade dried and ground with grinder to obtain course particle.

PREPARATION OF PLANT EXTRACTS

1. **Aqueous Extract:** For aqueous extract bark powder was separately homogenized with sterile distilled water at 1:8 w/v ratio in a pestle and mortar and filtered through muslin cloth. The filtrate thus obtained was further strained through Whatman No. 1 filter paper (Zore *et al.*, 2004). The extraction was carried out at room temperature.
2. **Organic Extract**: Organic extract was prepared by Soxhlet extraction method following (Okeke *et al.*, 2001). A thimble was prepared by using a 0.5mm Whatman filter paper. About 50 gm of powder material was uniformly packed in a thimble and run in soxhlet extractor (Fig. 3). It was run upto 48 hour or 22 cycles until the solvent in the sippon table of an extractor become colourless. After that, extracts were filtered with the help of filter paper and solvent was evaporated from extract with the help of rotary evaporator to get the syrupy consistency. The extract was then stored in refrigerator at 4ºC.

ANTIFUNGAL ACTIVITY TEST

Antifungal activity was screened by disc diffusion method. The water and ethanol extracts of *Moringa oleifera* leaves bark were tested against *Rhizopus stolonifer and Microsporum gypseum*. The PDA medium was poured in to the sterile petriplates and allowed to solidify. The test fungal culture was evenly spread over the media by sterile cotton swabs. Then disc (6 mm) coated with 200µl of each extracts were transferred into the petri plate. The plates were incubated at 27°C for 48-72 hrs. After the incubation the plates were observed for formation of clear incubation zone around the disc indicated the presence of antifungal activity. The zone of inhibition was recorded.

RESULT AND DISCUSSION

Table 1: Antimicrobial activity of *M. oleifera* methanol bark extract against different test microorganisms

Pathogens	Zone of inhibition in (mm)							
	200mg/ml	100mg/ml	50mg/ml	25mg/ml	12.5mg/ml	6.25mg/ml	3.125mg/ml	Drug
R.stolonifer	9.00±2.00	8.66±1.52	8.33±1.15	7.66±0.05	7.00±1.00	-	-	-
M.gypseum	8.66±1.15	8.33 ± 1.00	7.66±0.58	7.33±0.57	7.00±1.00	6.67±0.58	-	-

Table 2: Antimicrobial activity of *M. oleifera* aqueous bark extract against different test microorganisms

Pathogens	Zone of inhibition in (mm)							
	200mg/ml	100mg/ml	50mg/ml	25mg/ml	12.5mg/ml	6.25mg/ml	3.125mg/ml	Drug
R.stolonifer	**9.66±1.52**	**8.33±1.15**	**8.00±0.57**	**7.66±0.58**	**6.66±1.15**	**6.33±0.57**	**-**	**-**
M.gypseum	**9.00±1.73**	**8.66±1.15**	**8.33±1.00**	**7.67±0.58**	**7.33±0.57**	**7.00±1.00**	**6.67±0.57**	**-**

Tona *et al.*1998 studied that plants are a valuable source of potentially supportive structures for developing novel chemotherapeutic drugs. In case of fungal species, methanol extracts of bark were more active against *M. gypseum* the respective diameter of inhibition at different dilutions were (8.66, 8.33, 7.66, 7.33, 7.00, 6.67) mm in comparison to *R. stolonifer* inhibitions were recorded (9.00, 8.66, 8.33, 7.66, 7.00) mm, respectively.

Fungal species the bark aqueous extract of *M. oleifera* inhibited the growth of *M. gypseum* showing diameter of inhibition (9.00, 8.66, 8.33, 7.678, 7.33, 7.00, 6.67) mm and *R. stolonifer*was comparatively less effective the diameter of inhibition are observed (9.66, 8.33, 8.00, 7.66, 6.66, 6.33) mm, respectively.

The ultimate conclusion of this study supports the traditional medicine use of different plant extracts in treating different infections caused by pathogenic fungi either by using a single or combined extracts. It also suggests that a great attention should be paid to medicinal plants which are found to have plenty of pharmacological properties that could be sufficiently better when considering a natural food and feed additives to improve human and animal health.

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