Journal of Research in Medical and Dental Science
2021, Volume 9, Issue 2, Page No: 191-193

Available Online at: www.jrmds.in
eISSN No. 2347-2367: pISSN No. 2347-2545

Antifungal Activity of *Ficus racemosa* Ethanolic Extract against Dermatophytes-An *in vitro* Study

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ABSTRACT

Ficus Racemosa also known as Ficus glomerata which is widely used medicinal plant with anti-bacterial antidiabetic, anti-inflammatory, hepatoprotective, anticancer activities. Ficus Racemosa belongs to Moraceae family which is prevalently seen in warmer regions of Asia, America, Malaysia, Indonesia, Burma, and Australia. Most prominently distributed in India. Various parts of the plant like leaves, bark, root, fruit possess therapeutic value. The decoction of the leaves are used to treat dysmenorrhea, Latex of the leaves is used to treat blisters in measles. Fruit is an astringent used to treat constipation, sed as carminative agent .Bark is used to treat dysentery, diabetes, burns and swelling. Roots are used to treat gonorrhea; heat stroke .The objective of the study is to evaluate in-vitro antifungal activity of Ficus racemosa against three human pathogenic fungi. Trichophyton rubrum Microsporum gypseum and Epidermophyton floccosum. The herbal extract was tested against various concentrations adopting agar well diffusion method. The results indicated that the extract was ineffective and did not show antifungal activity.

Key words: Ficus racemosa, Anti-fungal, Dermatophytes, Zone of inhibition

HOW TO CITE THIS ARTICLE: Lakshmi T, Antifungal Activity of *Ficus Racemosa* Ethanolic Extract against Dermatophytes-An *in vitro* study, J Res Med Dent Sci, 2021, 9 (2): 191-193.

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Received: 14/11/2020

Accepted: 05/02/2021

INTRODUCTION

Skin, nail infections are seen most commonly in India. Dermatophytosis is one of the most frequent skin diseases of mankind. The disease is widely distributed all over the world and more common in men than in women. There are three genera of mould that cause dermatophytosis. These are *Epidermophyton, Trichophyton and Microsporum* [1,2].

Ficus racemosa is a moderate sized tree found in various parts of India. It is popular in indigenious system of medicine like ayurveda, siddha, unani and homoeopathy [3].

All parts of this plant (leaves, fruits, bark, latex, and sap of the root) possess medicinal value. The powdered leaves are mixed with honey is given in bilious infections. Fruits are a good remedy for visceral obstruction and also useful in regulating diarrhea and constipation.

The astringent nature of the bark has been employed as a mouthwash in spongy gum and also internally in dysentery, menorrhagia and haemoptysis [4]. The bark possesses antiseptic, antipyretic and vermicidal properties. The decoction of bark is used in the treatment of various skin diseases, ulcers and diabetes.

It is also used as a poultice in inflammatory swellings/boils and regarded to be effective in the treatment of piles, dysentery, asthma, gonorrhea, gleet, menorrhagia, leucorrhea, hemoptysis and urinary diseases [5].

Literature studies indicate *F. racemosa* exhibits various pharmacological effects such as hepatoprotective, chemopreventive, antidiabetic, anti-inflammatory, antipyretic, antitussive and antidiuretic [6-8].

Traditional medicine have been employed in the management of fungal infections rather than conventional preparations like terbinafine, some of the natural plants includes garlic, lemon grass, datura, acacia, a triplex, ginger, black seed, neem, basil, eucalyptus, alfalfa and basil [9-13].

Keeping this in view, the present study

was designed to evaluate the in vitro antidermatophytic activity of *ficus racemosa* against *Microsporum gypseum, Trichophyton rubrum and Epidermophyton floccosum.*

MATERIALS AND METHODS

Plant material

Ficus Racemosa extract is obtained as a gift sample from Green Chem herbal extracts & formulations, Bengaluru, India.

Fungal cultures

Three fungal pathogen used were procured from Institute of Microbial Type Culture Collection, Chandigarh (IMTECH) viz., *Microsporum gypseum* MTCC No. 2819, *Trichophyton rubrum* MTCC No.296 and *Epidermophyton floccosum* MTCC No.613 , and are maintained in Sabouraud Dextrose Agar.

Antifungal activity

Agar well diffusion method

On sterile plates containing sabouraud's Dextrose Agar, the fungal cultures were swabbed. Wells of 6 mm diameter were bored in each plate. The wells were filled with varying concentrations of the sample. The plates were incubated at 28° C for 72 h for evaluation. The diameter of inhibition zones formed around the wells was measured in millimeters. The study was performed in duplicates for all the samples [14].

RESULT AND DISCUSSION

Dermatophytosis (tinea or ringworm) of the scalp, skin, and nails is caused by a group of fungi known as dermatophytes which have the tendency to utilize keratin as a nutrient source [15,16].

Dermatophytes are one of the common microbes which causes superficial mycosis and the lesions are characterized by circular disposition, desquamation, alopecia and erythema of the edges [17].

The prevalence of dermatophytes varies according to geographical location, exposure to human, living conditions etc., *M. gypseum*; a *mycelial keratinophilic* fungus is a geophilic dermatophyte. Humidity, pH and fecal contamination constitute relevant factors in the determination of its presence and of other *keratinophilic fungi* in the soil. *M. gypseum* possesses the capacity to infect animal and human tissue using keratin as its principal substrate [18-20]. Various literature studies reveal that this may be the cause of infections in different domestic and wild animal species. [21-22].

M. gypseum has been described as causing subcutaneous mycosis in humans and has been associated with opportunistic infections occurring in patients with Human Immunodeficiency Virus (HIV) [23–28].

The study shows that there is no significant antifungal activity while testing against three dermatophytes in which the *Microsporum gypseum* is most commonly affecting humans and animals (Table 1).

Table 1: Antifungal activity of *ficus racemosa* against dermatophytes.

S.No	Micro Organism	15 mg/ml	25 mg/ml	50 mg/ml
1	*Microsporum gypseum*	No activity	No activity	No activity
2	*Epidermophyton floccosum*	No activity	No activity	No activity
3	*Trichophyton rubrum*	No activity	No activity	No activity

CONCLUSION

Dermatophytosis is refractory to treatment, and the spectrum of antifungals for treating dermatophytosis is narrow. However, we suggest that *ficus racemosa* extract do not exhibit pharmacological effects and could not be employed in management of cutaneous infections.

ACKNOWLEDGEMENT

The authors wish to thank the management of Saveetha Dental College & Hospitals for their kind support.

CONFLICT OF INTEREST

Nil.

REFERENCES

1. Aljabre SH, Richardson MD, Scott EM, et al. Germination of *trichophyton* mentagrophytes on human stratum corneum in vitro. J Med Veterinary Mycol 1992; 30:145-152.
2. Otang WM, Grierson DS, Ndip RN. Antifungal activity of arctotis arctotoides (L.f.) *O. Hoffm* and gasteria bicolor Haw. Against opportunistic fungi associated with human immunodeficiency virus/acquired immunodeficiency syndrome. Pharmacogn Mag 2012; 8:135–140.

3. Chopra RN, Chopra IC, Handa KL, et al. Indigenous drugs of India. 2nd Edn Academic Publisher Calcutta 1958; 508-674.
4. Nadkarni KM, Nadkarni AK, Chopra RN. Indian materia medica popular prakashan. Bombay 1976; 1:548-550.
5. Mandal SC, Tapan K, Maity J, et al. Hepatoprotective activity of *Ficus racemosa* leaf extract on liver damage caused by carbon tetrachloride in rats. Phytother Res 1999; 13:430-432.
6. Khan N, Sultana S. Chemomodulatory effect of *Ficus racemosa* extract against chemically induced renal carcinogenesis and oxidative damage response in Wistar rats. Life Sci 2005; 29:1194-1210.
7. Rao BR, Murugesan T, Sinha S, et al. Glucose lowering efficacy of Ficus racemosa bark extract in normal and alloxan diabetic rats. Phytother Res 2002; 16:590-592.
8. Mandal SC, Saha BP, Pal M. studies on bacterial activity of *Ficus racemosa* leaf extract. Phytother Res 2000; 14:278-280.
9. Rao BR, Anipama K, Swaroop A, et al. Evaluation of anti-pyretic potential of *Ficus racemosa* bark. Phytomed 2002; 9:731-733.
10. Rao BR, Murugesan T, Pal M, et al. Antitussive potential of methanol extract of stem bark of *Ficus racemosa Linn*. Phytother Res 2003; 17:1117-1118.
11. Kirtikar KR, Basu BD. Indian medicinal plants. 2nd Edn 1975; 3:2327-2328.
12. Chandrashekhar CH, Latha KP, Vagdevi HM, et al. Anthelmintic activity of the crude extracts of Ficus racemosa. Int J Green Pharm 2008; 2:100-103.
13. Malairajan P, Geetha GK, Narasimhan S, et al. Analgestic activity of some Indian medical plants. J Ethno Pharmacol 2006; 106:425-428.
14. Jyothilakshmi M, Jyothis M, Latha MS. Antidermatophytic activity of mikania micrantha kunth: An invasive weed. Pharmacognosy Res 2015; 7:S20-S25.
15. Fernandez-Torres B, Mayayo E, Boronat J, et al. Subcutaneous infection by *Microsporum gypseum*. Br J Dermatol 2002; 146:311-313.
16. Lacaz CS, Porto E, Martins JEC. Micologia médica-fungos, actinomicetos e algas de interesse médico. Sarvier Ltda,São Paulo 1991; 695.
17. Gitao CG, Agab H, Khalifalla AJ. An outbreak of a mixed infection of dermatophilus congolensis and *microsporum gypseum* in camels (*Camelus dromedarius*) in Saudi Arabia. Rev Sci Tech 1998; 17:749-755.
18. Romano C, Massai L. Proximal subungual hyperkeratosis of the big toe due to *Microsporum gypseum*. Acta Derm Venereol 2001; 81:371-372.
19. Ogawa H, Summerbell RC, Clemons KV, et al. Dermatophytes and host defence in cutaneous mycoses. Med Mycol 1998; 36L166-173.
20. Bentubo HD, Fedullo JD, Corrêa SH, et al. Isolation of *Microsporum gypseum* from the haircoat of health wild felids kept in captivity in Brazil. Br J Microbiol 2006; 37:148-152.
21. Lakshmi T, Sri Renukadevi B, Senthilkumar S, et al. Seed and bark extracts of *Acacia catechu* protects liver from acetaminophen induced hepatotoxicity by modulating oxidative stress, antioxidant enzymes and liver function enzymes in Wistar rat model. Biomed Pharmacother 2018; 108:838–844.
22. Devaraj E, Lakshmi T. Cytotoxic and apoptotic effects of *acacia catechu* in hepatocellular carcinoma hepg2 cells. J Clin Exp Hepatol 2017; S76.
23. Ezhilarasan D, Lakshmi T, Nagaich U, et al. *Acacia catechu* ethanolic seed extract triggers apoptosis of SCC-25 cells. Pharmacognosy Magazine 2017; 13.
24. Rajeshkumar S, Menon S, Venkat Kumar S, et al. Antibacterial and antioxidant potential of biosynthesized copper nanoparticles mediated through Cissus arnotiana plant extract. J Photochem Photobiol B 2019; 197:111531.
25. Perumalsamy H, Sankarapandian K, Veerappan K, et al. In silico and in vitro analysis of coumarin derivative induced anticancer effects by undergoing intrinsic pathway mediated apoptosis in human stomach cancer. Phytomedicine 2018; 46:119–130.
26. Saravanan M, Arokiyaraj S, Lakshmi T, Pugazhendhi A. Synthesis of silver nanoparticles from Phenerochaete chrysosporium (MTCC-787) and their antibacterial activity against human pathogenic bacteria. Microb Pathog 2018; 117:68–72.
27. Karthikeyan G, Geetha RV, Thangavelu L. Antimitotic activity of Piper nigrum on clinical isolates of candida. Int J Res Pharm Sci 2019; 10:1167–1171.
28. Sharma P, Mehta M, Dhanjal DS, et al. Emerging trends in the novel drug delivery approaches for the treatment of lung cancer. Chem Biol Interact 2019; 309:108720.