ejpmr, 2020,7(7), 418-420

SJIF Impact Factor 6.222

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

IN VITRO STUDY OF ANTIFUNGAL ACTIVITIES OF *MALTYADI TAIL* ON *DARUNAK*/DANDRUFF (AGAINST MALASSEZIA *FURFUR*, MALASSEZIA *GLOBOSA*, CANDIDA *ALBICANS)*

Deepti Negi*[1], Anoop Kumar Singh[2], Vipin Kumar[3] and Shweta G. Shukla[4]

[1]MD. Scholar (P.G. Department of Agad Tantra), Uttarakhand Ayurved University, Rishikul Campus, Haridwar (Uttarakhand), India.

[2]Associate Professor (P.G. Department of Agad Tantra), Uttarakhand Ayurved University, Rishikul Campus, Haridwar (Uttarakhand), India.

[3]Assistant Professor, Department of Pharmaceutical sciences Gurukul Kangri, Vishwavidyala Haridwar (Uttarakhand), India.

[4]Assistant Professorat (P.G. Department of Kayachikitsa), Uttarakhand Ayurved University, Rishikul Campus, Haridwar (Uttarakhand), India.

***Corresponding Author: Deepti Negi**

MD. Scholar (P.G. Department of Agad Tantra), Uttarakhand Ayurved University, Rishikul Campus, Haridwar (Uttarakhand), India.

Article Received on 05/05/2020 **Article Revised on 26/05/2020** **Article Accepted on 16/06/2020**

ABSTRACT

This study was carried out with an aim and objective of study is to access antifungal activity of *Maltyadi tail* and to determine the zone of inhibition of *Maltyadi tail* on fungal strains (Malassezia *furfur*, Malassezia *globosa* and Candida *albicans*) in the present study antifungal activities of *Maltyadi tail*. Dandruff is a progressive problem now days. It has so many causes but fungus is one of them. There are three common pathogens which are responsible to cause dandruff, Malassezia *furfur*, Malassezia *globosa* and Candida *albicans.* So many formulations are used to control dandruff, one is oil. Different kind of oils has been using from the dawn of the time but not able to cure dandruff completely. In *ayurveda* there are also various medicines for *darunak*. One of them *acharya chakrapani* described *maltyadi tail* in the treatment of *darunak*. The aim of this study was to evaluate the antifungal activities of the *maltyadi tail*. The antifungal activity was determined by the agar-well diffusion method against fungal pathogens (Malassezia *furfur*, Malassezia *globosa* and Candida *albicans*). The study showed effective result of *maltyadi tail* in antifungal activities.

KEYWORDS: Antifungal activities, Dandruff, *Darunak*, *maltyadi tail*.

INTRODUCTION

The *maltyadi tail* is herbal formulation described in *chakradatta* as treatment of *darunak*(dandruff)[1] Plant parts and plant products are still remain the principal source of pharmaceutical agents used in herbal medicine.[2,3] There were four ingredients present in formulation of *maltyadi tail*, *jaati*, *karveer*, *chitrak* and *karaj*. Base of the oil (*maltyadi tail*) was *tila tail*. In previous research all ingedients has shown antifungal,[4,5,6] antibacterial,[7,8,9,10] properties. Antifungal resistance is a rising threat. Resistance of antifungal gradually increasing,[1] due to this condition it is necessary to research on herbal medicines and found the other way for fungus treatment. *Malassezia* is a genus of fungi. *Malassezia* is naturally found on the skin surfaces of many animals, including humans. Malassezia *furfur* is a kind of fungus that causes dandruff.[12] Predisposing factors to *Malassezia* skin disease include humidity, Sweating , oily skin (seborrhoea) ,Acne and its treatment with oral antibiotics such as tetracyclines, Immunodeficiency (eg, HIV infection), systemic corticosteroids, or immunosuppression by medications.[13] One more main cause of dandruff is the single-celled microbe Malassezia *globosa*, which exists on everyone's scalp. Almost 50% of people's bodies have a negative reaction to the presence of this fungus, causing dandruff.[14] Candida *albicans* is most often the cause of a fungal skin infection, although other *Candida* strains can also cause it,[15] This study carried out the efficacy of *maltyadi tail* as antifungal oil.

Aim & Objective -This study aimed to investigate the *in vitro* study of antifungal activities of *Maltyadi tail* on dandruff **(**against Malassezia *furfur*, Malassezia *globosa*, Candida *albicans*.)

MATERIALS AND METHODS

Evaluation of antifungal activity

1. Collection of raw drugs
2. Selection and collection of pathogens

3. Preparation of Test sample
4. Preparation of media & media plate and antimicrobial activity using well diffusion method
5. Recording and interpreting results.

(1) Collection of Raw Drugs – In this research work, raw drugs were collected from following sources-
Jaati patra- Rishikul Parisar, Rajrajeswari Nursery, Gurukul Parisar
Karveer moola- Rishikul Parisar
Chitrak moola and karanj beeja- Pannalal Brijlal General Merchant
Tila tail- patanjali ayurvedic shop haridwar (ranipur mod)

(2) Selection and collection of pathogens
In this research work, Malassezia *furfur*, Candida *albicans and* Malassezia *globosa* have been taken as fungal strains. The pathogenic strains of these species of fungus were procured from 'Institute of Microbial Technology' (IMTECH), Chandigarh and the stock cultures maintenance & antifungal study were done at 'Analytical Division of Bilwal Medchem and Research Laboratory Pvt Ltd.

- Malassezia *furfur* : (MTCC NO: 1374)
- Candida *albicans*: (MTCC NO: 227)
- Malassezia *globosa:* (MTCC NO: 1765)

(3) Preparation of test sample
Test sample (*Maltyadi tail*) was dissolved in DMSO at to make 5, 10 and 15 % concentration solution.

(4) Preparation of media & media plate and antimicrobial activity using well diffusion method
(a) Preparation of media & media plates: Muller-hington agar medium was taken for all pathogens. Heated the agar (38 gm) with water (1litre) at 100^0C till it becomes transparent, and then kept it in hot air oven for 15 minutes. The sterilized media were poured in sterile petri dishes aseptically in a Laminar flow cabinet. After solidifying of agar plates (nearly about 15 to 20 minutes), they were kept inverted in incubator at 37ºC for overnight for checking any contamination. The ready Agar plates were then transferred in zip seal plastic cover and kept in a cold room.

(b) Revival of microbial cultures -A simple way to obtain micro-organism (fungus) is to grow them in a flask in broth medium. 100 ml Nutrient broth medium were transferred in conical flasks (of quantity 100ml) 20ml each. The flasks were capped with cotton plug and autoclaved at 121ºC for 20 minutes at 15 lb pressure per square inch.

(c) Inoculation:- The fungal strains were cultured in their respective broths in a water-bath shaker for 48 hr below 30 °C. After inoculation, the microbial cultures were incubated at room temperature overnight in a shaker for their growth. Growth, in this case, means the development of a population of cells from one or few cells. Next day, the mass of daughter cells became visible to the naked eye as cloudiness (turbidity) in all flasks.

(d) Streaking:- Applied a microbial culture to the surface in a petri plate and spread them with cotton swab sticks.
(e)Preparation of concentrations of the extracts and antifungal (positive control)
The concentrations 5 % w/v of solvent was prepared in sterile Eppendorf tubes.

(f) Well Diffusion Method
Wells (of about 5mm diameter) were made on the plates with the help of sterile stainless steel borer. About 5, 10 And 15 % concentrations of test sample were added using sterile syringe into the wells and allowed to diffuse at room temperature for 2hrs. Control experiments comprising inoculums without test sample were set up.
Groups design: Negative Control was *Tila tail*, positive control was 5 % ketoconazole and Test groups are 5% solution w/v of *Maltyadi tail* in DMSO**,** 10% solution w/v of *Maltyadi tail* in DMSO**,** 15% solution w/v of *Maltyadi tail* in DMSO.

(5). Recording and interpreting results
After the disks were placed on the plate, inverted the plate and incubate at 35ºC for 48 hours. After incubation, measured the diameter of the zones of complete inhibition (including the diameter of the disk) and recorded it in millimeters. The presence of colonies within a zone of inhibition may predict eventual resistance to that agent.

Observation and result- The results of the study provide scientific basis for the use of the *maltyadi tail* as antifungal oil.

Zone of inhibition (ZOI)
The result of anti-fungal activity of *Maltyadi tail* in presented in Table No.1.
The zone of inhibition measured is12mm on Malassezia *Furfur*, 14mm *on* Malassezia *globosa* and 15mm on Candida *albicans*. This result is compared with both negative and positive control group. The results reveal that *Maltyadi tail* showed anti-fungal activity against all three strains.

Table 1:

Zone of inhibition (mm)			
Name Of Pathogens	**Negative Control (*Tila tail*)**	**Test Sample (*Maltyadi tail*)**	**Positive Control (ketaconazole)**
Malassezia *furfur*	4mm	12mm	18mm
Malassezia *globosa*	4mm	14mm	20mm
Candida *albicans*	6mm	15mm	21mm

Negative control- *Tila tail* Test sample- *Maltyadi tail*, Positive control-Ketaconazole.

DISCUSSION

Dandruff is a common scalp disorder affecting most half of the pubertal population of any ethnicity and both genders. Dandruff generally characterized by itching and presence of flakes on the skin and hair of the scalp. In Ayurveda, this condition is termed as *'Darunak'*. *Darunak* is a *Vata –Kaphaj Vyadhi*. There are three causative pathogens which are responsible to cause dandruff, Malassezia *furfur*, Malassezia *globosa* and Candida *albicans.* The antifungal study is measure by zone inhibition. Zone of Inhibition Test, also called a Kirby-Bauer Test, is a qualitative method used clinically to measure antifungal resistance. It is an area of media where fungus is unable to grow, due to presence of a drug that inhibits their growth. In this research work, Malassezia *furfur*, Candida *albicans*, Malassezia *globosa* have been taken as fungal strains for zone inhibition test. The size of zone of inhibition usually related to antifungal activity present in the sample- a larger zone of inhibition usually means that the antifungal is more potent.

Zone of inhibition(mm) of *maltyadi tail* showed 12mm against malassezia *furfur*, 14 mm against malassezia *globosa* and 15mm against candida *albicans* while *Tila tail* showed 4mm,4mm, & 6mm respectively. The maximum zone of inhibition (antifungal activity) of *maltyadi tail* was against fungus candida *albicans*

CONCLUSION

It can be concluded that the antifungal activity of *maltyadi tail* showed better result compare to *tila tail*, against the fungal pathogen Malassezia *furfur*, Malassezia *globosa* and Candida *albicans* which are known pathogens regarding dandruff /Darunak

REFERENCES

1. Priya vrat sharma, cakradatta (Sanskrit text with English translation), chaukhambha publishers varanasi, 3rd edition, 2002; 445.
2. M. B. Ibrahim, "Anti-microbial effects of extract leaf, stem and root barkof *Anogeissus leiocarpus* on *Staphylococcus aureaus*, *Streptococcuspyogenes*, *Escherichia coli* and *Proteus vulgaris*," *J. Pharma. Devpt.*, 1997; 2: 20-30.
3. Tin A. Khaing, Evaluation of the Antifungal and Antioxidant Activities of the Leaf Extract of *Aloe vera* (*Aloe barbadensis* Miller), World Academy of Science, Engineering and Technology, 2011; 75.
4. https://www.natureword.com/properties-and-benefits-of-jasmine/.
5. Wang, XM: Plomley, JB: Newman, RA: Cisneros, A: Anal. Chem, 2000; 72(15): 3547 – 3552.
6. Dhale DA, Markandeya SK, Antimicrobial and phytochemical screening of *Plumbago zeylanica Linn* (Plumbaginaceae) leaf, Journal of experimental sciences, 2011; 2(3): 4-6.
7. Antioxidant Ramesh Dhani et al., J.chem. phar. Res., 2011; 3(5): 519-523.
8. Chopra. R. N., Nayar. S. L. and Chopra. I. C. *Glossary of Indian Medicinal Plants.* Council of Scientific and Industrial Research, New Delhi, 1986.
9. Activity Falang, Kakjing Dadul, Uguru Mary Ogonnaya, Wannang Noel Nenman, Azi Iliya Hosea, Chaiamaka Nwoye, Antiulcer activity of *Plumbago zeylanica* Linn root extract, J.Nat. prod. plant resources, 2012; 2(5): 563-567.
10. Brar GS, Ahuja L Sesame: its culture, genetics, breeding and biochemistry. Ann Rev plant Sci., 1997; 1: 245-313.
11. Varadraj Pai, Department of Dermatology, Goa Medical College, Bambolim, Goa, India, Antifungal resistance in dermatology, Indian journal of dermatology, Year, 2018, 63(5): 361-368.
12. https://iliveok.com/health/malassezia-furfur-causative-agentseborrhea_99682i16099.html.
13. https://www.dermnetnz.org/topics/malassezia-infections/.
14. https://www.headandshoulders.com/en-us/healthy-hair-and-scalp/dandruff/malassezia-how-the-main-cause-of-dandruff-works.
15. Gow, N.A.R. "Microbe Profile: Candida albicans: a shape-changing, opportunistic pathogenic fungus of humans". Microbiology, 2017; 163(8): 1145–1147.