ISSN : 2249- 5746
International Journal of Ayurvedic and Herbal Medicine 7:4 (2017) 2848–2851
Journal homepage:http://www.interscience.org.uk
DOI:10.18535/ijahm/v7i4.30
Impact Factor: 4.415

Anti-Fungal Activity of Sinduradya Taila

Dr. Akshara Devrukhkar[1] , Dr Archana Gharote[2] , Dr Nilesh Suryavanshi[3]

[1] MD(Scholar), Department of Rasashastra and Bhaishajya Kalpana, D Y Patil School Of Ayurveda, D Y Patil Deemed to be University, Nerul, Navi Mumbai.
[2]Professor and HOD, Department of Rasashastra and Bhaishajya Kalpana, D Y Patil School Of Ayurveda, D Y Patil Deemed to be University, Nerul, Navi Mumbai.
[3]Associate Professor , Department of Rasashastra and Bhaishajya Kalpana, D Y Patil School Of Ayurveda , D Y Patil Deemed to be University, Nerul, Navi Mumbai.

ABSTRACT:
The aim of this study is to assess the antifungal activity of *Sinduradya Taila* and to determine the zone of inhibition of *Sinduradya Taila* on the fungal strain Of *Aspergillus Niger* . Fungi like *Aspergillus Niger* is a common food contaminant which grows as a black mould on food & vegetables , It is an air-borne pathogen. It commonly causes Otomycosis which is an ear disorder which may damage tympanic membrane & ear canal . In case of ear infections, *Aspergillus Niger* invades the outer ear canal which can cause damage to the skin it comes in contact with. Aspergillosis is a serious lung disease which is frequent in horticultural workers Antifungal activity of *Sinduradya Taila* was seen using agar cup diffusion method and MIC was determined using tetrazolium salt method. The test drug was effective and exhibited a significant activity against *Aspergillus Niger*.

KEYWORDS : *Sinduradya Taila , Aspergillus Niger ,* Antifungal activity.

INTRODUCTION :

Fungal infections are increasing due to immunodeficient states like Diabetes Mellitus, HIV, wide spread use of broad spectrum antibiotics, steroids etc . When many people think of fungi, they first envision beautiful fruiting bodies that grow out of the damp grass and soil. However, there is a much darker side of the kingdom fungi that can cause sickness and death. The members of the *Aspergillus* genus do not grow on recently rained-on terrain, nor do they need a specific temperature to grow in. These are molds , most familiarly *Aspergillus niger*, can in some cases cause disease in humans, animals and plants. *Aspergillus niger* contains toxins that can easily affect people with weak immune systems causing sickness or even death. These toxins can be inhaled by humans, most commonly by people who work around plants or peat, and can cause a lung disease called Aspergillosis, which has infected over 300,000 people worldwide (keir, 2013). *Aspergillus niger* is not one of those that are so deadly, but can definitely cause sickness and allergic reactions.

Aspergillus niger is an asexual saprophytic fungus that can grow on dead leaves, stored grain, compost piles and other decaying vegetation. *A. niger* is a very thermotolerant fungus that can thrive in freezing conditions and very hot weather (metzger, 2008) . It produces its spores on an asexual structure called the conidium. The spores can be inhaled when simply working with anything *A. niger* has colonized.

Invasive otitis externa (IOE) due to *Aspergillus* is a rare, potentially life-threatening, invasive fungal infection affecting immunocompromised patients. The invasive process may lead to skull base osteomyelitis with progressive cranial nerve palsies and can result in irreversible hearing and neurological impairment.

Sinduradya Tail is a herbo-mineral oil preparation which can be used for fungal infections.

The present study was aimed to evaluate the antifungal activity and the minimum inhibitory concentration (MIC) of *Sinduradya Taila* on *Aspergillus Niger* strain.

AIM and OBJECTIVES:

To evaluate the antifungal activity and the minimum inhibitory concentration (MIC) of *Sinduradya Taila* on *Aspergillus Niger* strain.

MATERIAL AND METHODS:

Preparation of *Sinduradya Taila*:

Reference: *chakradutta / kushta chikitsa* /152 (Trikamji, 2008, reprint edition 3-5 vol 26)

Ingredients: *Sinduradya Taila* has 3 ingredients: *girisindur, jeerak* and mustard oil

Girisindur is classified under sadharana rasa in Rasashastra. : According to Rasatarangini 21/151-152, when used for external application it cures all 13 types of *kshudra kushta (pama, vicharchikka, sidhma*, etc). It is good for the skin(*twachya*) . It has wound healing and germicidal properties. cures all types of *rakta dosha*. (Shastri)

Jeerak (*Cuminum Cyminum*) (Sastry, Third edition 2008) : Apart from other uses of *jeerak* it is useful in cases of *Krumi* (worm infestation) and *kushta* (skin disorders)

Mustard oil (*Brassica*) : Mustard oil shows Anti-fungal activity as well as Anti-Inflammatory properties.

Procedure :

1. 5gms of *girisindur* was mixed with 10 gms of *Jeerak (Cuminum Cyminum) churna* and a paste was made.
2. Mustard oil was taken in a quantity of 100 ml and water 400 ml (4 times the quantity of oil). (image 1)
3. The above ingredients were mixed together and heated on a low flame until all the water is evaporated and the *siddhi lakshans* of *sneha kalpa* are observed .100 ml of *Sinduradya Taila* is obtained as a final product(image 2). (Trikamji, 2008, reprint edition 3-5 vol 26)

5gms *girisindur*+10gm *jeerak kalka*+100ml mustard oil+400ml water $\xrightarrow{\triangle}$ *Sinduradya tail*

EVALUATION TECHNIQUE :

Protocol: Antifungal activity was seen using agar cup diffusion method and MIC was determined using tetrazolium salt method.

Medium used: Sabouraud's Agar

The test organisms were grown in Sabouraud's broth for 48 hour and used for the study. The optical densities of the culture were fixed using 0.5 Mcfarlands standard. (Standards, 2000 5th ed.) (Latgé, 1999)

Minimum inhibitory concentration:

Preparation of Samples: 100 µl of sample was diluted in DMSO and further further used for analysis.

Preparation of Inoculums:

The loop culture was grown in Sabouraud's broth for 48 hour. The culture OD was adjusted was to McFarland standard 0.5 in order to get 1.5 x 10^8 CFU/ml. The microbial cell suspension was mixed to homogeneity to give a final density of 1 x 10^6 CFU/ml.

The minimum inhibitory concentration (MIC) of *A.niger* was determined by using tetrazolium microplate assay. This assay was performed using flat bottom 96-well clear microtitre plates. The wells in first row of each column were filled with Sabouraud's broth which serves as blank; the second row was filled with 100 µl of Sabouraud's broth containing standard antibiotics while third row was filled with 100 µl of Sabouraud's broth containing diluents. Fourth row was filled with 100 µl 2X Sabouraud's broth and 100 µl of samples was added in each column. Then 5^{th} row onwards each wall were filled with Sabouraud's broth. An identical two-fold serial dilution were made from 4^{th} row to the 12^{th} row.Lastly, 100µl of Fungal

inoculum were added in all the wells from 2nd row to 12th row and mixed thoroughly to give final concentrations ranging from 0.5mg/ml- 1.953125 µg/ml with 5 x 10^5 CFU/ml. The cultured microplates were sealed with lid and incubated at 37°C for 48h. The MIC of samples was detected following addition (40µl) of 0.2mg/ml p-iodonitrotetrazolium chloride in all the wells and incubated at 37°C for 30 min. Microbial growth were determined by observing the change of color p-iodonitrotetrazolium chloride (INT) in the microplate wells (pinkish-red formazan when there is growth and clear solution when there is no growth). MIC was defined as the lowest sample concentration showing no color change (clear) and exhibited complete inhibition of fungal growth. (Isenberg, 2nd edition)

RESULTS and DISCUSSION :

Zone of Inhibition : The result of antifungal activity of *Sinduradya Taila* is presented in table no.1. the zone of inhibition measured is 23mm , this result is compared with the control group. The results revealed that the *Sinduradya Taila* showed antifungal activity against *Aspergillus Niger* and exhibited complete inhibition of *Aspergillus Niger*. (image 3)

Minimum Inhibitory Concentration (MIC) : The MIC was seen at 4th fold concentration i.e 10 % as presented in table no.2.

Table 1 : zone of inhibition of *Sinduradya Taila*

Organism	*Sinduradya Taila*	Control
Aspergillus Niger	23mm	22mm

Table 2 : Minimum Inhibitory Concentration (MIC) of *Sinduradya Taila*

Organism	MIC
Aspergillus Niger	4th fold

CONCLUSION:

Sinduradya Taila has shown significant fungicidal activity on Aspergillus Niger strains with minimum inhibitory concentration of 10% i.e 4th fold.

Sinduradya Taila can be used externally for Aspergillus Niger infection.

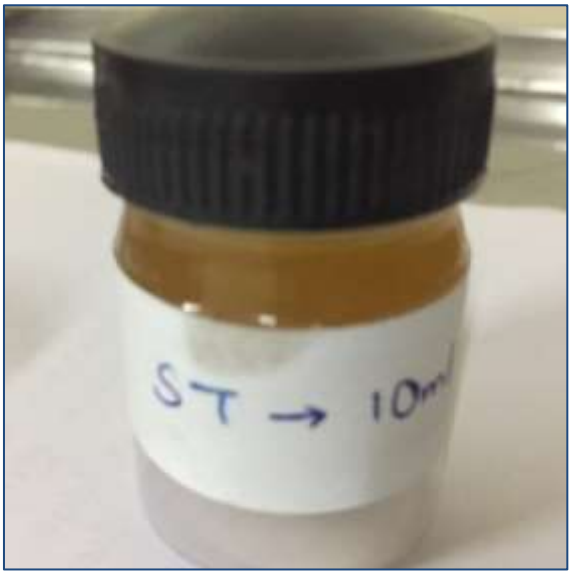

Image 1: Preparation of *Sinduradya Taila* **Image 2**: Prepared *Sinduradya Taila*

Image 3: zone of inhibition of ST on *A.Niger*

Bibliography

1. Isenberg, H. d. (2nd edition). *Clinical microbiology procedure handbook.*
2. keir, G. ,. (2013). Cyclical caspofungin for chronic pulmonary aspergillosis in sarcoidosis. *thoraxjnl* .
3. Latgé, J. P. (1999). Aspergillus fumigatus and aspergillosis. *Clinical microbiology reviews,* , 12(2), 310-350.
4. metzger, B. (2008, november 2008). *in mushroom observer*. Retrieved august 4, 2017, from http://mushroomobserver.org/name/show_name/15030?_js=on&_new=true.
5. Sastry, D. J. (Third edition 2008). *Dravyaguna Vijnana (Study of the Essential Medicinal Plants in Ayurveda).* Varanasi: Chaukhambha Orientalia. 978-81-7637-093-6 (Vol. II).
6. Shastri, K. *Rasatarangini 11th edition.* delhi: Motilal banarasidas publication.
7. Standards, N. C. (2000 5th ed.). *National Committee for Clinical Laboratory Standards. Methods for Dilution, Antimicrobial Susceptibility Tests for Bacteria that Grow Aerobically Approved Standard.* Wayne, PA.
8. Trikamji, a. Y. (2008, reprint edition 3-5 vol 26). *ayurveda dipika commentry of Chakrapanidatta.* Varanasi ,India: Chaukhamba Subharti Prakashana.