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Research Article

**DETERIUM MICROCARPUM AND ITS USAGE AS ANTI
FUNGAL**¹Dr. Humna Saleem, ²Dr. Rabia Mansoori Panu, ³Dr. Khansa Ismail¹Govt General Hospital, Samna Abad²Wah Medical College Wah Cantt³WMO, RHC Tibbi Qaisrani Taunsa Sharif**Abstract:**

Objective: The purpose of this research is to check the fungicidal action from the roots or bark taken from tallow tree or sweet detar (usually known as *deterium microcarpum*) to prevent from some kinds of fungi which are cause of spread of disease.

Methodology: A special apparatus known as Soxhlet was used to take off the solvents from the tallow tree and this extraction was carried out with the use of anti-freeze agent CH₃OH, ether and seventy percent methanol with H₂O. This prepared material fungicidal action was checked in opposition to some disease spreading fungi. Names of some disease-causing fungi are *Aspergillus*, *Penicillium digitatum*, *mentagrophytes*, *Candida albicans* and *Cryptococcus* isolated at different values of 200, 500, 100, 1000, and 2000 micro gram per millilitre by using the diffusion method with the use of filter paper disc. The concentration ranges of sixty-five to one thousand microgram per millilitre at room temperature and thirty-seven centigrade were interpreted as minimum inhibitory concentration abbreviated as MIC and minimum fungicidal concentration abbreviated as MFC respectively.

Results: The removed elements from the sweet detar were fungicidal proved by testing carried out on all types of the fungi types. The extracts were active against fungi tested at all concentrations of the extracts used with *Candida albicans* showing the lowest vulnerability. The minimum inhibitory concentration and minimum fungicidal concentration values for the removed elements were from fifty to one thousand micro grams per millilitre.

Conclusion: fungicidal matters can be extracted from sweet detar or tallow tree better known as *Deterium microcarpum*. These extracts barks or roots are used to make the fungicidal medicines which are used against may infections caused by fungi such as tumours in the lungs and brain due to fungi and some skin diseases.

Keywords: fungicidal, *Deterim microcarpum*, MIC, MFC, sweet detar, tallow tree, bark, candida, methanol, ether.

Corresponding author:

Dr. Humna Saleem,
Govt General Hospital,
Samna A ad

QR code



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INTRODUCTION:

The research of hindrance to the fungicidal means has been delayed because of bactericidal resistance. The amount of the infections caused by the fungi has been increased although different alterations have been occurred in the field of medical as frequent application of therapies that distort the immunity system of human being, the most common use of bactericidal means, most frequent use of devices which enters into the human veins for treatments or testing and the advent of advanced immune deficiency syndrome (AIDS) [1].

From the last thirty years, Amphotericin B which is famous for spreading the poison in the kidneys and obtained from a soil streptomycete, was the main medicine available to fight against the complications generated by fungi. In the end of second last decade and in the start of last decade of twenty centuries [2], the sanction of the C₃H₄N₂ known as imidazole (that is an antimetabolite) and the C₃H₃N₃ known as triazoles (it is used as herbicide) were the important innovations to treat infections caused by the fungi within a safe limit. There is priority of triazoles in usage because of its safe sketch. Fluconazole is a type of triazole and its use is very extensive in the field of medicine. One crore and sixty lakh people have been treated by this medicine in which three lakhs are the patients of advanced immune deficiency syndrome only in the USA just after the invention of the disease [3].

Happening at the same time with the wide spread use of the medicines, there is an increase in the fungicidal hindrance. These innovations in the field of medicine and increase in the diseases spread by the fungi have raised the quest for the exploration of modern and safer medicines to fight against the disaster of the infections spread by the fungi [4]. *Deterium microcarpum* is the name of a plant which has fruits of round shape and the shape of their leaves is like crown. The diameter of their fruits is four centimetres. The height of this tree is from ten to twenty-five metres. [5]. Generally, it is used to rectify the infection of the skin of head where the hairs grow. It is also used for the treatment of diarrhoea in the children having green stool.

METHODOLOGY:

The laboratory of the n provided the different grades of petroleum as acetone, methanol and ether. The elements of the sweet cedar were gathered from the close areas of the university and a doctor from the wildlife department of the university confirmed those elements. A clean knife was used to cut the roots of tallow tree into small pieces, dried and changed into the powder form with the use of a mixer. Then the powder stored in the close bottle for further use. 4-hundred-gram

plant elements in powder form in each lot, was removed by the use of an extracting procedure known as Soxhlet apparatus. Apparatus uses thousand millilitres of ether or methanol or thirty percent water and seventy percent of methanol. Weight was used for each lot to regain the solvent and the dry elements were obtained from them and placed in bottles. Alkaloids, flavonoids, glycosides, phenols and tannins were checked through the standard of phytochemical [6].

With slight alteration, the diffusion method was in force. PDA was placed into the dishes of Petri and they were waited to be solid. The spores were separated from them easily. Different types of the solvents were used for this process in different percentages. In the last, the disc was put on to the plate of spores of the fungi with the effort of controls which were positive. The disc dipped in the water (without minerals) only without the removed elements were in action as controls of negative. The albicans culture plates were warmed at thirty-seven centigrade for one day and other fungus culture plates were warmed at thirty-two centigrade for forty-eight to seventy-two hours. The inhibition area for fungi describes the fungicidal activity. The AD method was used with some alterations for the firmness of MIC. The plates were warmed at twenty-five centigrade for two days and hindrance in the growth was recorded. For the check of MFC the plates which did not show ant growth after two days were warmed for more seventy-two hours. If the growth is not observed, the rate is noted as MFC.

RESULTS:

The study of the chemical compounds in the plants reveals the availability of different elements as alkaloids, balsams and tannins as mentioned in table no 1. The research outcome proved that tallow tree or sweet cedar or *Deterium microcarpum* has a strong reaction against the fungi which is the cause of many diseases. The extracts taken from them are describing the different distance of inhibition for different types of the fungi. There is sixteen millimetres inhibition area for the *A Niger*, *Cr. neoformans* and *F oxysporum* at two thousand micro grams per millilitre as mention in table no 2. The lower activity was fourteen millimetres inhibition area for the albicans at two thousand micrograms per millilitre. The least reaction was provided by the mixer of water and methanol. Amphotericin B provided the highest activity which provides eighteen-millimetre inhibition area. MIC and MFC results are provided in table no three for ideal fungicidal agents. The outcome of this research provides than minimum inhibitory concentration and minimum fungicidal concentration values of the removed elements from one hundred to two hundred micrograms per

milligram. There are different values of MIC and MFC for the extracts or removed elements of the

different types of the fungi.

Table-I: Phytochemical constituents of root extracts of *Deuterium microcarpum*

Extract	Saponins	Tannins	Alkaloids	Flavonoids	Balsams	Anthraquinones
Petroleum ether	-	-	+	+	+	-
Methanol	+	+	+	+	+	-

Table-II: Antimicrobial activities of *Deterium microcarpum*

Organisms		Zone of inhibition (mm)												
		100	200	500	1000	2000								
MW	PE	ME	MW	PE	ME	ME	MW	PE	ME	MW	PE	Amp B	Nyst	
								(10 µg/ml)(10 µg/ml)						
A. niger	---	4	4	8	8	10	8	10	14	8	12	16	8	10
P. digitatum	---	4	8	8	10	14	10	14	16	10	16	20	10	12
F. oxysporum	--	-	6	8	6	8	10	10	12	10	12	16	18	16
Cr. neoformans	--	-	6	8	10	6	10	10	12	8	12	16	12	14
T. mentagrophytes	-	4	6	12	14	8	16	18	10	18	20	22	-	6
C. albicans	----	6	6	8	10	12	8	10	12	8	12	14	-	-

Table-III: Minimum inhibitory concentration (MIC) and minimum fungicidal concentration (MFC) of the methanolic extracts of *Deterium microcarpum* against the test organisms

	Amphotericin B				Nystatin	
	MIC (µg/ml)	MFC (µg/ml)	MIC (µ/ml)	MFC (µg/ml)	MIC (µg/ml)	MFC (µg/ml)
A. niger	400	700	25	25	200	200
P. digitatum	100	300	100	100	200	200
F. oxysporum	400	500	12.5	25	50	50
Cr. neoformans	200	300	12.5	50	25	50
T. mentagrophytes	100	100	400	700	300	400
C. albicans	700	1000	500	500	50	50

DISCUSSION:

The occurrence of the elements in tallow tree has caused the fungicidal actions against the fungi which are the cause of different diseases as mentioned in table no 1. These elements of the tree provide the ordinary protection against the disease-causing viruses, fungi and bacteria [7]. All types of the fungus are in danger because of the elements of this sweet cedar. This result is completely opposite to the previous studies [8]. In those studies, fungicidal elements were tested and the life beings provide hindrance to all extracts of the tree. For curing these diseases, Amphotericin B (AMB) is thought to be a standard to fight against the diseases. Amphotericin B has many side effects

which can cause the life loss such as poisoning of the kidneys, high temperature and chills [9].

Azole fungicidal medicines are widely in use these days. The elements of the tallow tree were very active against the diseases caused by fungi. These diseases spreading fungi resist the medicines against it. So, a combination of different drugs is used for the fungicidal process [10].

Myotic infections are the infections caused by the groups of fungi. Fungi are the main contributing elements in the spreading of these infections. Different types of diseases as tumour of lungs and skin diseases are the result of different types of fungi [11]. The large minimum fungicidal

concentration values to the equivalent minimum inhibitory concentration values in table no 3 proved that the fungal substances act as fungicidal when at lower concentrations [12]. The fresh fungicidal materials can be got from the bark or roots of *Detarium microcarpum* to prepare the fungicidal medicines against the different types of the infections caused by the fungi. Further investigations on a large number of kinds of fungi and bacteria should be complied with to know the best results of this medicine [13].

CONCLUSION:

Fungicidal matters can be extracted from sweet detar or tallow tree better known as *Detarium microcarpum*. These extracts barks or roots are used against may infections caused by fungi such as tumours in the lungs a d brain due to fungi and some skin diseases.

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