



## Anti-Fungal Activity of Wheat Grass Extract

S.G. Vishnu Prasanna\*, R. Gayathri, Vishnu Priya

Saveetha Dental College and Hospitals, Saveetha University, Chennai, Tamil Nadu, India.

\*Corresponding author's E-mail: [vishnu24prasanna@gmail.com](mailto:vishnu24prasanna@gmail.com)

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### ABSTRACT

The aim of the study is to determine the anti fungal activity of Wheat grass extract. This study was done to evaluate the anti fungal activity of wheat grass extract. Wheatgrass is a food prepared from the cotyledons of the common wheat plant, *Triticum aestivum*. It contains chlorophyll, amino acids, minerals, vitamins, and enzymes. Wheatgrass extract is extracted from wheatgrass. Wheatgrass is a good source of potassium, also a very good source of dietary fiber, vitamin A, vitamin C, vitamin E(alpha tocopherol), vitamin K etc. It is gluten-free. Various parts of wheat grass show anti fungal activities which can show effects on various fungal microorganisms. The study may help in formulation of economical and new anti fungal agents derived from Wheat grass. The antifungal activity of wheatgrass extract was studied.

**Keywords:** Wheatgrass extract, antifungal effect, agar-well diffusion method.

### INTRODUCTION

Wheat (*Triticum aestivum*) is a cereal grain, a type of fruit called Caryopsis<sup>1</sup>. Wheatgrass is purported that ancient Egyptians found sacred the young leafy blades of wheat and prized them for their positive effect on their health and vitality<sup>2</sup>. *Triticum aestivum* has been used as herbal medicine in present and past cultures and is highly valued for its therapeutic and nutritional properties. Wheatgrass is food that can be prepared from the cotyledons of *Triticum aestivum*. Wheatgrass is also available commercially as a spray, cream, gel, massage lotion and a liquid herbal supplement. It contains chlorophyll, amino acids, minerals, vitamins and enzymes. It is gluten free. Wheatgrass juice is beneficial in curing more diseases due to its important function that, it can arrest the growth of unfriendly bacteria which are responsible for spreading certain diseases. Antifungal activity of wheatgrass juice against *Candida albicans* was tested using agar well diffusion method. Wheatgrass extract has anti microbial activities<sup>4</sup>. Wheat grass extract has a high content of bioflavonoids which may add towards antimicrobial effects<sup>5</sup>.

Wheatgrass is known to boost health and vitality both in humans and animals<sup>6</sup>. Wheatgrass is a good source of potassium, also a very good source of dietary fiber, vitamin A, vitamin C, vitamin E (alpha tocopherol), vitamin K etc. Wheatgrass is also extremely nutritious. Wheatgrass juice encourages weight loss since it is rich in fiber content. Leaves of Wheatgrass extracts increases the activities of liver enzymes, as well as lipid peroxidation<sup>7</sup>. Wheatgrass is also effective in severe cases of acute stomach ache, gas, paralysis, infection of digestive system, heart attack, diabetes, asthma, constipation, leukaemia and other cancer<sup>8</sup>. Wheatgrass extract is also used as topical haemostatic agent, topical

anti-inflammatory agent, stimulant of fibroblastic, with a wide range of healing properties. It is also inexpensive<sup>6</sup>. Wheatgrass extract has been effective in reducing activity of ulcerative colitis, and some forms of genetic blood diseases including anemia<sup>9</sup>. Wheatgrass juice is a faster way to cleanse our body from environmental pollutants. Its high levels of enzymes and amino acids work like a —natural cleanser|| to detoxify the liver, eliminate toxic heavy metals from the blood stream, rid the body of waste matter, and slow down the aging process<sup>11</sup>. The anti-inflammatory properties of Wheatgrass exerts a positive effect on reducing pain and swelling.<sup>12</sup> The Fermented wheatgrass extract improves high risk of survival of skin melanoma patients<sup>13</sup>. Decreased oxidative stress and high antioxidant level has been observed<sup>14</sup> in people who take wheat grass regularly.

### MATERIALS AND METHODS

#### Materials

The fungal strain such as *Asperigillus Niger*, *Asperigillus flavus*, *Trichoderma viride* were provided by Biozone and the chemicals were purchased from Himedia.

#### Method

##### Preparation of Fungal Spore

Fungi are removed from the substrate surface using fine forceps and broken and opened in sterilised water in order to provide a spore suspension. The filamentous fungi were grown on Sabouraud dextrose agar (SDA) slants at 28 °C for 10 days. The spores were collected using sterile double distilled water and stored in refrigerator.

A glass container is sterilised with ethanol has been sprayed on its surface. A sterilised pipettes is used to transfer few drops of sterilised water into the glass slide.



Alternatively it is pipettes on to the centre of the agar plate and is carefully shaken to spread the suspension. The prepared spores are checked every 24 hours to establish its germination.

Once the spores have germinated, a small piece of spore containing that agar is isolated and examined via compound microscope for its quality.

#### Agar Well Diffusion Method

It is a method which refers to the movement of molecules through the matrix that is formed by gelling of agar. When performed under controlled conditions, the degree of the movement of the molecules can be related to the concentration of the molecule.

This phenomenon forms the basis of agar diffusion assay that is used to determine the susceptibility of the resistance of fungal strain to an anti fungal agent. Antifungal activity was carried out using disc diffusion method (Murray et al., 1995). Petri plates were prepared with 20 ml of sterile MHA (Hi- media, Mumbai). The test culture was swabbed on the top of the solidified media and allowed to dry for 10 min. Wells were made on the media using a well borer. Different concentrations of the sample (20, 40 and 60  $\mu$ L per well) were loaded on the wells. Ketakonazole (10  $\mu$ g /well) was used as a positive control. These plates were incubated for 48 hrs at 28 °C. Zone of inhibition was recorded in millimeters (mm).

## RESULTS AND DISCUSSION



Figure 1

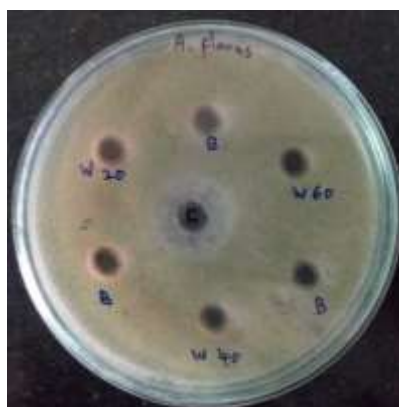


Figure 2

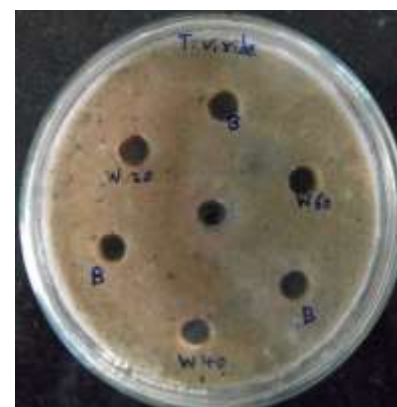


Figure 3

W- Wheat grass Extract; B - Blank C – Ketakonazole

Figures show antifungal activity of samples by using well diffusion method

Table 1: Shows antifungal activity of the sample by using well diffusion method

Sample	Concentration ( $\mu$ g)	Zone of inhibition (in mm)		
		<i>Aspergillus niger</i>	<i>Aspergillus flavus</i>	<i>Trichoderma viride</i>
Wheat grass extract	20	-	-	-
	40	7	-	-
	60	9	7	6
Ketakonazole	10 $\mu$ l	22	20	17

Antifungal activity of wheatgrass extract was analysed by Agar well diffusion method against *Asperigillus niger*, *Asperigillus flavus*, *Trichorma viride* taking Ketakanozole as standard(fig. 1,2,3). 60mug of wheatgrass extract showed antifungal action and zone of inhibition(22,20,17) with *Asperigillus niger*, *Asperigillus flavus*, and *Trichoderma viride*. At a concentration of 40mug wheatgrass extract was effective only against *Asperigillus niger*, *Asperigillus flavus* and *Trichoderma viride* did not show any zone of inhibition (table 1). At a concentration of 20mug wheatgrass extract an antifungal activity against any of the strains taken.

Thus wheatgrass extract was effective and showed antifungal activity against all the strains (*Asperigillus*

*niger*, *Asperigillus flavus*, *Trichoderma viride*) only at a higher concentration(60mug) it was effective and at low concentration it was not effective.

#### CONCLUSION

This study was conducted to evaluate the anti fungal activity of wheat grass extract. Natural products are important source of new drugs which are having importance in modern medicine. Wheatgrass has been shown to have potential anti-inflammatory and anti-aging properties<sup>8</sup>. Wheatgrass consists of a minimum of 13 vitamins that includes B12, cytochrome oxidase, superoxide mutase and mucopolysaccharide<sup>10</sup>. Wheatgrass is known to help improve sleep, support

weight loss and healthy skin, teeth, eyes, muscles and joints, minimise fatigue and regulate blood pressure<sup>6</sup>. It is proven to be beneficial under several conditions such as common cold, anaemia, diabetes, cancer, eczema etc. In this study antifungal property of wheat grass extract has been proved. Thus, Wheatgrass extract can be made part of daily dietary intake in order to explore its maximum benefits. Taking wheatgrass as a supplement in the mid-morning and in mid-afternoon is useful for “green energy boost”<sup>6</sup>.

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