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Antioxidant Activity of *Aspergillus Stereus* AF1

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Abstract: *Marine actinomycetes are potential provider of novel bioactive metabolites and currently emerged as an important source for natural products with unique chemical diversity. The antioxidant activity of* Aspergillus fumigatus *was assayed by different procedures and correlated with its extracellular total phenolic contents. different complementary test systems such as 1,1-diphenyl-2-picryl hydrazyl free radical (DPPH) assay, reducing power, ferrous ion and nitric oxide ion scavenging activity, and ferric reducing antioxidant power (FRAP) assay were used to assess the antioxidant potential of Aspergillus Stereus AF1.*

Keywords: *Actinomycetes, antioxidant activity, 1,1-diphenyl-2-picryl hydrazyl free radical (DPPH) and Aspergillus Stereus AF1*

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I. Introduction

Antioxidant and other supportive therapies protect red blood cells against oxidant damage(Kukongviriyapan V et al :,2008, Filburn CR et al :,2007). Iron chelators mobilize tissue iron by forming soluble, stable complexes that are then excreted in the feces and/or urine. Chelating therapy reduces iron-related complications and thereby improves quality of life and overall survival (Shinar E et al:, 1990,Hebbel RP et al : ,1990). It is well known that the generation of free radicals happens because of microbial infection which leads to DNA damage (Maeda H et al :,1998). different complementary test systems such as 1,1-diphenyl-2-picryl hydrazyl free radical (DPPH) assay, reducing power, ferrous ion and nitric oxide ion scavenging activity, and ferric reducing antioxidant power (FRAP) assay were used to assess the antioxidant potential of *A.fumigatus*.

Recently, fungi have emerged as the new sources of antioxidants in the form of their secondary metabolites (Rodrigues KF et al :,2005, Arora DS et al :,2010). Fungi are remarkably a diverse group including approximately 1.5 million species, which can potentially provide a wide variety of metabolites such as alkaloids, benzoquinones, flavanoids, phenols, steroids, terpenoids, tetralones, and xanthones (Archer DB et al :,2000). They demonstrate variety of bioactivities along with antioxidant properties and function as varied as their structure. They are exploited in medicine and industry and considered to be potential sources of new therapeutic agents.

II. Material S And Method

I. Antioxidant Activity:

1. Dpph Activity:

The stable 1, 1-diphenyl-2-picryl hydrazyl radical (DPPH) was used to determine the free radical-scavenging (antioxidant) activity of the extracts. The samples are kept at incubation for 20 min and readings were recorded at 517 nm. Percent inhibition of antioxidant activity was calculated by using the following formula and readings of test sample are compared with that of ascorbic acid (Vitamin C) (Positive control).

% inhibition of DPPH = ((Control OD – Test OD)/Control OD) X 100

III. Results

1. Extract: Aspergillus Stereus Af1

S.No	Sample	Concentration (µg/ml)	% ofInhibition	IC_{50} Value (µg/ml)
	Aspergillus Stereus AF1	5	46.465± 0.95	77.50±1.15
		10	48.659±1.28	
		25	55.192±1.56	
		50	65.236±1.85	
		75	69.624±0.97	
		100	77.425±0.69	

Table 1: DPPH Assay of *Aspergillus Stereus* AF1

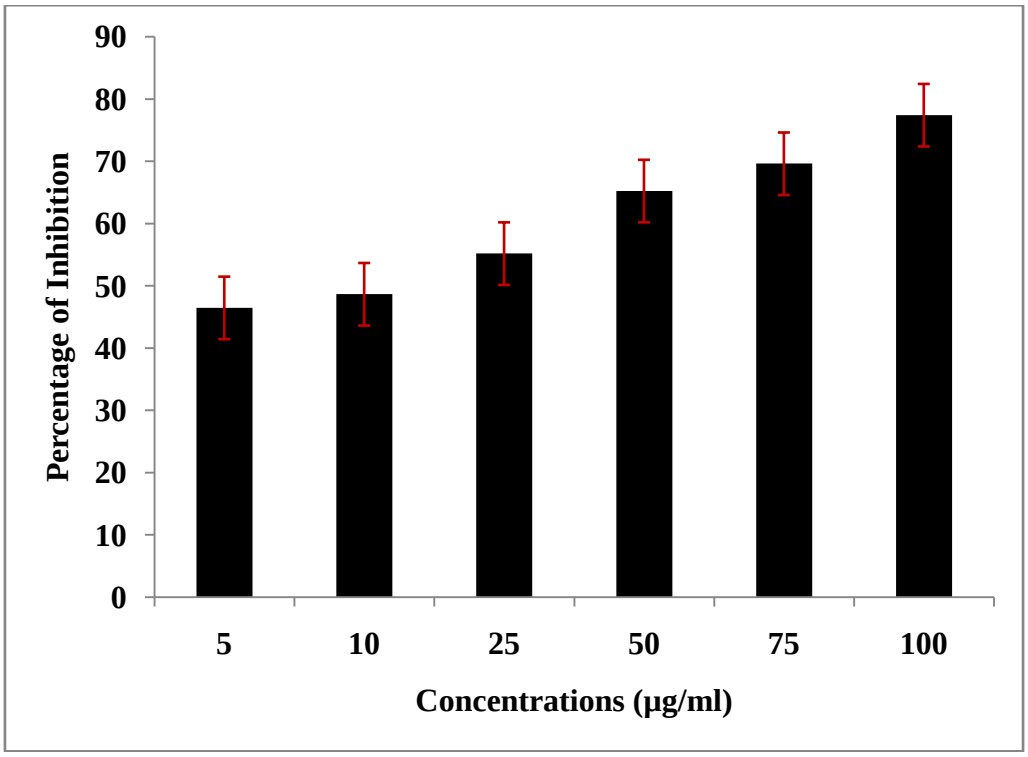

Figure 1: Percentage Of *Aspergillus Stereus* AF1

2. Ascorbic Acid:

S.No	Sample	Concentration (µg/ml)	% of Inhibition	IC_{50} Value (µg/ml)
2	Ascorbic acid	5	34.675±0.96	18.67±2.78
		10	40.546±0.58	
		25	45.907±0.77	
		50	49.864±1.65	
		75	50.8±0.94	
		100	51.438±1.55	

Table 2: DPPH Assay Of Ascorbic Acid

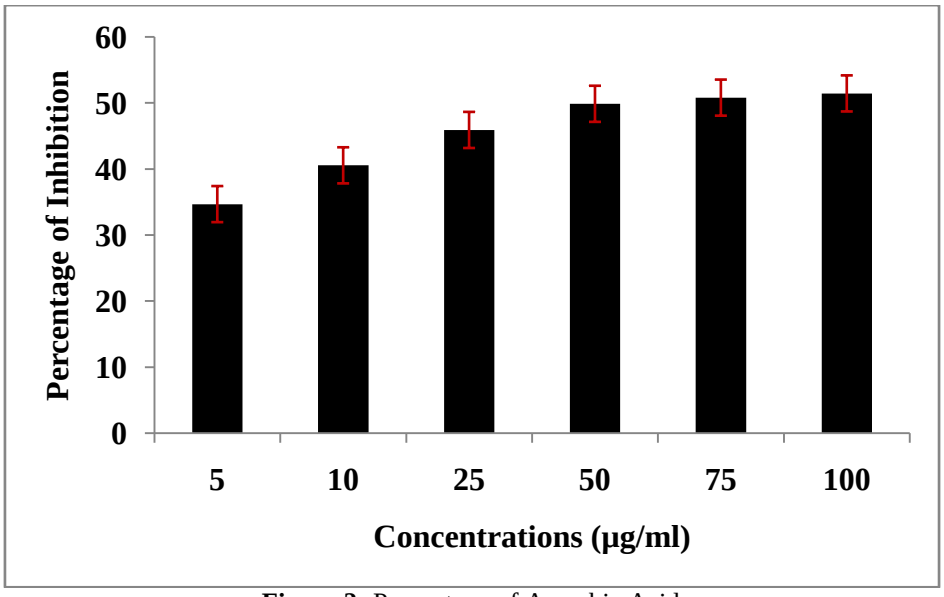

Figure 2: Percentage of Ascorbic Acid

3. Nitric Oxide Scavenging Activity:

Sodium nitroprusside in aqueous solution at physiological pH spontaneously generates nitric oxide (NO), which interacts with oxygen to produce nitrite ions, can be estimated using Griess Illosvosy reaction10.

Scavengers of NO compete with oxygen, leading to reduced production of NO and a pink colored chromophore is formed. The absorbance of these solutions was measured at 540 nm against the corresponding blank solutions. Percentage inhibition was calculated as

NO scavenging activity (%) = (A0 –A1) /A0 ×100

Where A0 is the absorbance of the control and A1 is the absorbance of the sample.

IV. Results

1. Extract: *Aspergillus Stereus*

S.No	Sample	Concentration (µg/ml)	% of Inhibition	IC_{50} Value (µg/ml)
1	*Aspergillus Stereus* AF1	5	41.979±0.85	66.10±2.05
		10	48.269±1.25	
		25	54.412±0.97	
		50	58.751±2.06	
		75	61.677±1.56	
		100	63.92±1.78	

Table 3: Activity of *Aspergillus Stereus* AF1

2. Ascorbic Acid:

S.No	Sample	Concentration (µg/ml)	% of Inhibition	IC_{50} Value (µg/ml)
2	Ascorbic acid	5	35.58±0.85	23.79±0.49
		10	41.79±1.66	
		25	46.17±0.93	
		50	50.85±1.98	
		75	51.79±1.56	
		100	52.39±1.76	

Table 4: Activity Of Ascorbic Acid

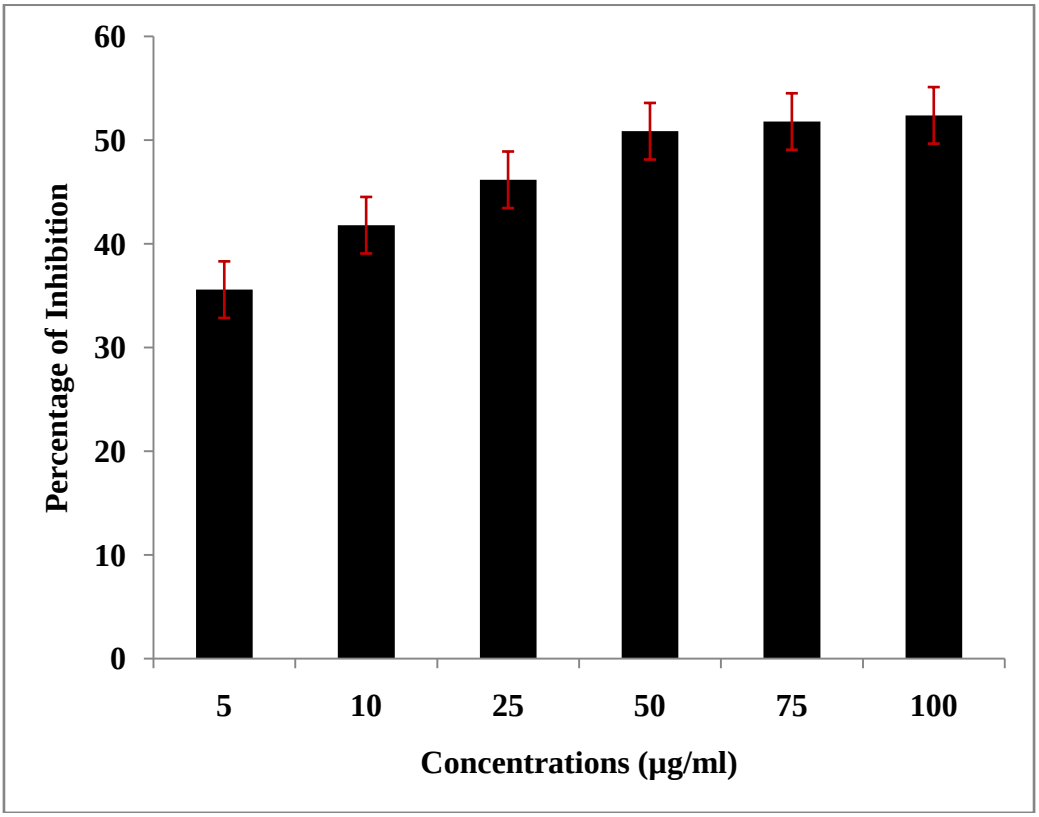

Figure 4: Percentage Of Ascorbic Acid

V. Discussion

From our study we conclude that *Aspergillus Stereus* AF1 possess significant antimicrobial activity as well as DPPH• free radicals scavenging, Fe+3 reducing, metal chelation activity, and inhibition of DNA damage. However, further studies are needed to extract and to identify the active compounds present in the isolate.

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