



## INFLUENCE OF ABIOTIC FACTORS ON GROWTH AND SPORULATION OF SAPROPHYTIC FUNGI.

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### ABSTRACT:

The abiotic factors like temperature and pH has effect on growth and sporulation of saprophytic fungi. Depletion of abiotic factors directly effect on growth and sporulation of fungi. At minimum and maximum temperature fungal growth retarded, while at optimum temperature stimulating fungal growth and sporulation. Temperatures 25°C +-2°C was most favorable for the growth of this pathogen. The maximum growth and sporulation of *Rhizopus stolonifer*, *Mucor racemosus*, *Fusarium oxysporum* and minimum growth and sporulation of *Penicillium corymbiferum* and *Colletotrichum circinace* was recorded at +27°C. Optimum pH at 5.5 to 7.5 highly favorable growth and sporulation occurred in *Rhizopus stolonifer*, *Mucor racemosus*, *Fusarium oxysporum* and *Penicillium corymbiferum*, *Colletotrichum circinace* minimum. .

**Keywords:** abiotic factors, saprophytic fungi, PDA media.

### INTRODUCTION:

The abiotic factors like temperature and pH having effect on growth and sporulation of saprophytic fungi. Depletion of abiotic factors directly effect on growth and sporulation of fungi.. Ellis et. al. (1993) studied an alfatoxin production of *Aspergillus favus* under modified atmosphere packaging conditions. Guynot, et.al (2002) stated that combined effects of weak acid preservatives, pH and water activity takes place on growth of *Eurotium* species of a sponge cake. Haasum et.al. (1998) studied ecophysiological characterization of common food-borne fungi in relation to pH and water activity under various atmospheric compositions. Paster N. and Lisker N. (1985). Stated that effects of controlled atmospheres on *Pmicillium patrrlum* growth and pan~lin production. The fungus failed to grow at 0°C and above 40°C. (Martin, S., V. Sanchis A. Teixido et al; 1996). Water and temperature relations and microconidial germination of *Fusarium moniliforme* and *F. proliferatum* from maize. According to Sautour, et. al. (2001) A temperature-type model for describing the relationship between fungal growth and water activity. Bonde M.R. et.al. (2013) shows that a continuous period of extreme temperature highs (33 °C) markedly reduced the rate of disease development. Optimum pH 6.5 to 7.5 sporulation was good seen in *Rhizopus stolonifer*, *Mucor racemosus*, *Fusarium oxysporum*, *Penicillium corymbiferum* and *Colletotrichum circinace*. PH ranges 5 to 8 were found suitable to the growth of all the pathogen.

### MATERIALS AND METHODS :

The samples of saprophytic fungi were collected from different localities, fields and markets of Ahmednagar district (M S). The samples are collected in different forms such as fruits, vegetable and food material. The samples were cultured on potato dextrose agar (PDA) medium and incubated at 25°C for seven days. The experimented reading after every third day. The isolated fungi were purified using single spore technique and then pure colonies of fungal isolates were maintained on PDA slants. The identification of saprophytic fungi were done recommended by Ellis (1971); Mukadam, et al. (2006). In the present study, the effect of various climatic factors like Temperature and pH on growth of *Rhizopus stolonifer*, *Mucor racemosus*, *Fusarium oxysporum*, *Penicillium corymbiferum* and *Colletotrichum circinace* was observed.

### RESULT AND DISCUSSION:

The abiotic factors like temperature and pH has effect on growth and sporulation of saprophytic fungi. Depletion of abiotic factors directly effect on growth and sporulation of fungi. At minimum and maximum temperature fungal growth retarded, while at optimum temperature stimulating fungal growth and sporulation. Temperatures 25°C +-2°C was most favorable for the growth of this pathogen. The maximum growth and sporulation of *Rhizopus stolonifer*, *Mucor racemosus*, *Fusarium oxysporum* and minimum growth and sporulation of *Penicillium corymbiferum* and *Colletotrichum circinace* was recorded at +27°C.

Optimum pH at 5.5 to 7.5 highly favorable growth and sporulation occurred in *Rhizopus stolonifer*, *Mucor racemosus*, *Fusarium oxysporum* and *Penicillium corymbiferum*, *Colletotrichum circinace* minimum.

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**Table No.1 Influence of abiotic factor temperature on growth and sporulation of saprophytic fungi**

Incubation temp. (°C )	<i>Rhizopus stolonifer</i>		<i>Fusarium oxysporum</i>		<i>Mucor racemosus</i>		<i>Colletotrichum circinace</i>		<i>Penicillium corymbiferum</i>	
	Growth (mm)*	Sporulation	Growth (mm)*	Sporulation	Growth (mm)*	Sporulation	Growth (mm)*	Sporulation	Growth (mm)*	Sporulation
10°C	03	-	01	-	03	-	-	-	01	-
15°C	27	+	22	+	12	-	15	-	11	-
20°C	45	++	40	+	52	++	42	++	25	+
25°C	62	++	65	++	69	+++	56	++	42	++
27°C	70	+++	71	+++	75	+++	67	++	51	++
30°C	61	++	63	++	70	+++	60	++	49	++
35°C	38	++	42	+	46	++	37	+	19	+
40°C	-	-	-	-	06	+	-	-	05	-

\* = Average of the three replication, - = No sporulation, + = Poor sporulation, ++ = Moderate sporulation, +++ = Good sporulation.

**Table No. 02: Influence of abiotic factor on growth and sporulation of saprophytic fungi**

pH	<i>Rhizopus stoliferi</i>		<i>Fusarium oxysporum</i>		<i>Mucor racemosus</i>		<i>Colletotrichum circinace</i>		<i>Penicillium corymbiferum</i>	
	Growth (mm)*	Sporulation	Growth (mm)*	Sporulation	Growth (mm)*	Sporulation	Growth (mm)*	Sporulation	Growth (mm)*	Sporulation
4.0	25	+	31	+	30	-	21	-	13	-
4.5	37	++	43	+	40	+	38	-	32	++
5.0	42	++	51	+	43	+	48	+	30	++
5.5	57	++	50	++	59	++	45	++	39	++
6.0	64	+++	61	++	60	+++	50	++	42	+++
6.5	71	+++	67	+++	65	++	57	++	45	++
7.0	75	+++	74	+++	72	+++	60	++	46	++
7.5	72	+	73	++	70	++	56	+++	44	++
8.0	54	+	48	+	50	++	51	+	40	+
8.5	46	-	41	+	44	++	35	+	30	+
9.0	34	-	30	-	33	-	28	-	25	-
9.5	30	-	20	-	25	-	21	-	15	-
10	25	-	15	-	21	-	17	-	14	-

\* = Average of the three replication, - = No sporulation, + = Poor sporulation, ++ = Moderate sporulation, +++ = Good sporulation