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**EFFECT OF DIFFERENT SUGAR SOURCES ON DRY WEIGHT OF  
RHIZOCTONIA SOLANI CAUSING ROT OF TOMATO SEEDLING ON  
10<sup>TH</sup> DAYS OF INOCULATION PERIOD UNDER IN-VITRO  
CONDITIONS**



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**ABSTRACT**

Physiological and biochemical study of *Rhizoctonia Solani* on different sugar sources in conical flask containing potato dextrose liquid medium were incubated at  $25\pm 1^{\circ}\text{C}$  for 10 days inoculation period and observed that growth and sporulation of fungus in different sugar sources and also mycelium mats were harvested, dried and weighed on electronic weighing balance. The result were noted that maximum growth was recorded on potato dextrose liquid medium containing Glucose as a sugar source (138 mg) followed by Fructose (136 mg), mannose (119

mg ), Sucrose (115mg), D-xylose (98mg), Galactose (98mg) and least growth in lactose and mannitol i.e. (46 mg) and (37 mg) respectively. But in Arabinose were not found growth and sporulation. It can be concluded that potato dextrose liquid medium containing sugar sources supported the growth and sporulation of fungus. Among them potato dextrose liquid medium containing Glucose was selective medium for further studies.

### **KEYWORDS**

*Rhizoctonia solani*, Sugar sources, Growth of Mycelium in mg, medium etc.

## RESEARCH PAPER

### Introduction

Tomato (*Lycopersicon esculentum*) is one of the most important vegetables in the world which suffers from various fungal diseases (Pharand, B. *et al.*,2002 and Fakhro, A. *et al.*,2010). Foot rot disease of tomato plants was found in various greenhouses in Iran and also found in India. Symptoms were characterized by soft rot of the seedling near the soil line. *Rhizoctonia solani* was consistently isolated from the damaged plant tissues. *Rhizoctonia solani* requires several specific compounds for its growth. Wide range of media containing different sugar sources can favor the isolation of the solani fungus which supports the dry weight growth and sporulation of the *Rhizoctonia solani* fungus.

Various sugar sources containing media compositions also influence the different colony morphology and sporulation of *Rhizoctonia solani*. Morphological characterization is the classical approaches to distinguish fungal species that is one of the main requisite of fungal taxonomy (Diba K *et.al*, 2007 and Zain ME *et al.*,2009). In plants, carbohydrates are available in simple as well as in complex form and fungi convert the complex forms into simple water soluble sugars of low molecular weight before utilization. It has been shown that different fungi respond differently with a particular compound and the fungi exhibit marked variation in the utilization of different carbohydrate sources. A critical and comprehensive knowledge of nutritional patterns and factors influencing the growth of fungi is a prerequisite for any study leading to the understanding of host-pathogen relationship. Not much attention has been given on the culture and growth media parameters of the pathogen. Hence, thorough knowledge on the influence of various culture media containing sugar sources on growth of the fungus as well as sporulation and colony characteristics.

### Material and Method

#### Collection of material

The present experiment conducted *In Vitro* at Department of Botany, Dr.Rafiq Zakaria College for women, Aurangabad. During this experiment, plant sample were collected from Tomato infected by root rot disease in growing track of Marathwada region.

#### Isolation of *Rhizoctonia Solani* method followed by C.V.Chudhary., 2006.

Pathogen was isolated from infected plant parts by tissue isolation technique on Potato Dextrose Agar (PDA) medium. Diseased parts were cut into small pieces with the help of sterilized blade.

Pieces were washed with sterilized distilled water and disinfected with 1 per cent HgCl<sub>2</sub> solution for 10 seconds. Thus, obtained disinfected tissues were immediately washed thrice with sterilized distilled water and aseptically transferred on PDA plates. Inoculated Petri plates were incubated at room temperature (27±2 °C)

### 3) Purification of fungi.

The obtained culture was purified by using hyphal tip culture method, and maintained on same medium for the further investigations

### 4) Inoculation of *Rhizoctonia Solani* on media containing different Sugar sources method followed by K. T. Arunakumara, *et. al*, ( 2015.)

Inoculation of Pathogen on Various sugar sources were incorporated molecular weight in Potato agar containing different sugar sources. The quantity of sugar required in each case was determined on the basis of their so as to provide equivalent amount of sugar present in the basal medium. The Sugar sources were Mannose, Glucose, Sucrose, Fructose, D-Xylose, Galactose, Mannitol, Lactose, Control(No Sugar). All the above Sugar sources were mixed thoroughly and the pH of medium was adjusted to seven by using 0.1 N sodium hydroxide or 0.1 N hydrochloric acid. The growth of fungus was studied as described under studies of carbon sources. 30 ml of each of the medium was taken in 100 ml flasks, sterilized and then inoculated with 5 mm discs taken from 9 days old culture of *A. solani* and *R. Solani* and incubated at 27±1°C for 10 days. Three replications were maintained for each treatment. According to H. S. Nagaraj Rao *et al.*, 1964 to Dry weights of the mycelium were estimated after filtering, washing and drying of the harvested mats.



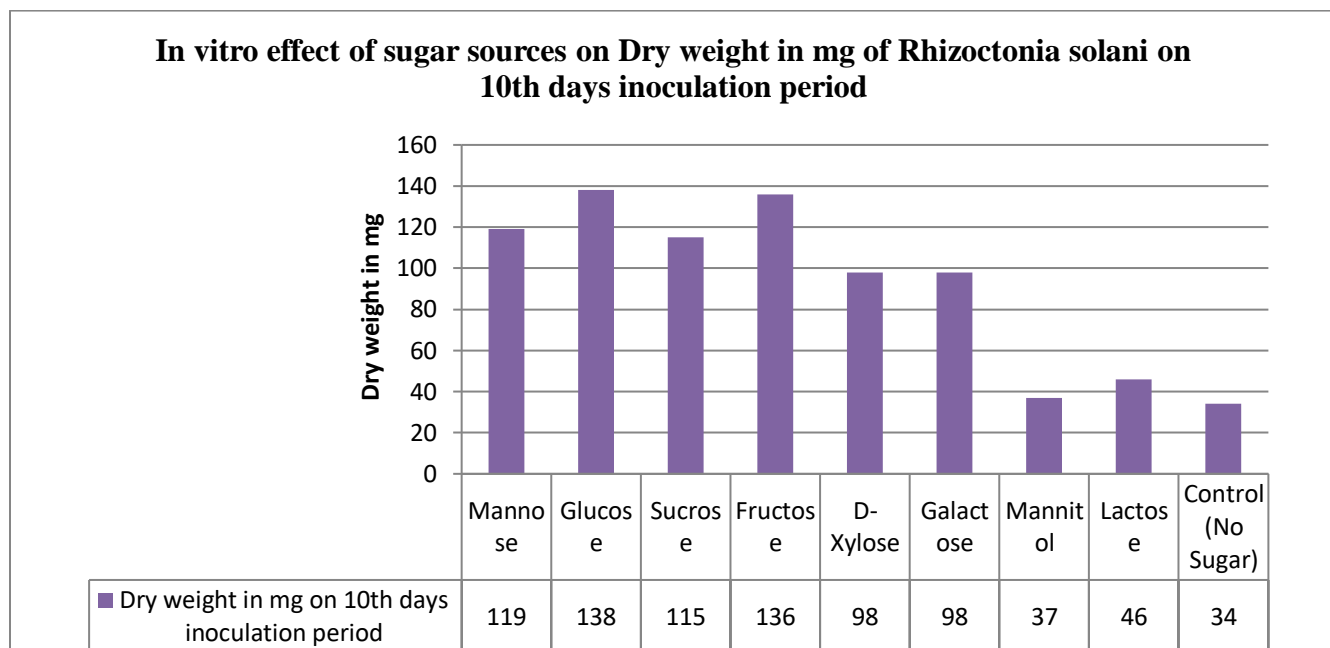
## Results

Isolates of *Rhizoctonia solani* and inoculation in different sugar sources containing medium. Effect of different sugars on dry weight of *Rhizoctonia solani* causing rot of tomato seedling on 10<sup>th</sup> days of inoculation period.

Sr. No.	Sugar /Concentration 1%	Dry weight in mg on 10th days inoculation period
1	Mannose	119
2	Glucose	138
3	Sucrose	115
4	Fructose	136
5	D-Xylose	98
6	Galactose	98
7	Mannitol	37
8	Lactose	46
9	Control(No Sugar)	34

Results revealed that a suitable liquid medium containing different sugar sources for the mycelial growth and sporulation of *Rhizoctonia Solani*, Potato dextrose liquid medium containing nine different sugar sources were tested in vitro. Inoculate *Rhizoctonia Solani* in conical flask containing potato dextrose liquid medium with sugar sources and were incubated at  $25\pm 1^{\circ}\text{C}$  for 10 days and observed that growth and sporulation of fungus in different sugar sources and also mycelium mats were harvested, dried and weighed on electronic weighing balance 0.001mg error. The result obtained tabulate in table 2. It is showed that maximum growth was recorded on potato dextrose liquid medium containing Glucose as a sugar source (138 mg) followed by Fructose (136 mg), mannose (119 mg), Sucrose (115mg), D-xylose (98mg), Galactose (98mg) and least growth in lactose and mannitol i.e. (46 mg) and (37 mg) respectively. But in Arabinose were not found growth and sporulation. It can be concluded that potato dextrose liquid medium containing sugar sources supported the growth and sporulation of fungus. Among them potato dextrose liquid medium containing Glucose was selective medium for further studies. Present observations are also supported by the work of Daza, et. al, (2006) who reported that glucose yielded the highest mycelium dry weights of all the strains of *Amanita caesarea* studied and also

by work 440 of Guler and Ozkaya (2008) who reported that better growth in ECM fungi occurred on defined media containing glucose, sucrose, maltose, and starch. Akata, et. al, (2012) also obtained similar results while studying growth of the mycelium of three ECM macrofungi.



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