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BIOMASS PRODUCTION OF *SEPTORIA LYCOPERSICI* A LEAF SPOT PATHOGEN OF TAMATO (*SOLANUM LYCOPERSICUM*) ON DIFERENT CARBON AND NITROGEN SOURCE

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ABSTRACT:
This study was carried out to investigate the effect of different carbon and nitrogen source on production of biomass of *Septoria lycopersici.* Five different carbon and nitrogen source were used for the production of biomass. *Septoria lycopersici* was a potential pathogen of *Solanum lycopersicum*, was isolated from diseased *Solanum lycopersicum* leaves from Nashik District and used for the present study. Pathogen was grown on the Czapek- Dox liquid medium substituting or adding different carbon, nitrogen to study biomass production. The growth as dry mycelial biomass was observed on the 8^{th} day of incubation period. A great extent of growth variation was observed on different carbon, nitrogen. Among the carbon source, glucose shows maximum biomass while dextrose with minimum biomass. From nitrogen source potasium nitrate shows maximum and nickel nitrate with minimum biomass production was recorded.

Keywords: Biomass, *Septoria lycopersici, Carbon, Nitrogen, Pahogen, Incubation,*

INTRODUCTION:

Tomato is the one of the most important fruit crop from Nashik District. From Nashik District mostly Dindori tehsil is involve in growing this fruit crop. In recent year the leaves and fruit is infected by *Septoria lycopersici* to tamato cultivation. Septoria leaf spot (*Septoria lycopersici*) is one of the most devastating foliar diseases in humid regions, particularly during the periods of rainfall, frequent dew or overhead irrigation conditions (Andrus et al., 1945; Delahaut and Stevenson, 2004).

For present study the infected leaves were collected from Dindori tehsil from Nashik district. Many studies carried out on the effects of various nutrient sources for mycelial biomass production of different mushroom species (Kim et al., 2003; Huang et al., 2007; Hassan et al., 2012; Lai et al., 2014; Ramesh et al., 2014,O. Erincik et.al.), When compared to the cultivation on solid media, submerged culture has many advantages such as higher mycelial biomass production at a small area and in a shorter time with lesser chances of contamination, achievement of fungal biomass with high and consistent quality, its low cost, the feasibility of mass production in a compact space and year around production (Yang et al., 2003; Tang et al., 2007; Wu et al., 2008). Hence, a great deal of attention has been focused recently on mycelial biomass production in submerged culture because it is a rapid and promising alternative cultivation method for obtaining fungal biomass (Yang and Liau, 1998; Kwon et al., 2009).

MATERIAL & METHODS:

The material used and methods followed during the present investigations were as follows:
The infected leaves were collected from Dindori tehsil, Nashik. The Czapek-Dox solid and liquid medium was used as a common medium for the studies. The composition of media was $NaNo_3$ - 2.00g, K_2HPO_4 - 1.00g, $MgSO_4,7H_2O$ - 0.50g, $FeSO_4$, $7H_2O$- 0.01g, Sucrose - 30g, Distilled water - 1000ml.

Solanum lycopersicum leaves affected with different diseases were collected from different locations of Nashik district. Isolation from these affected leaves was carried out on Czapek-Dox agar medium by usual tissue incubation technique. The Petri plates were incubated at room temperature (22-28^{0}C) until good growth of organism was observed. The colonies free from contamination were transferred on Czapek-Dox agar slant and maintained for further studies. Eight days old culture of organism was used for physiological studies. (Agrios, G.N., 1988)

The *Septoria lycopersici* was grown on the Czapek-Dox liquid medium and dry biomass was recorded at different intervals. Substituting or adding different compounds in the Czapek-Dox liquid medium studied the effect of carbon and nitrogen on growth. The growth as dry mycelial biomass was observed on the 10^{th} day of incubation period.

RESULT & DISCUSSION:

Growth and cultural characteristics of *Septoria lycopersici* :-

Septoria lycopersici was grown on Czapek-Dox liquid medium and dry biomass was observed for 10 days more rapid growth was observed during early stages and peak growth was observed on eight day (Table - 1). The growth rate lowers after eight day on word. On second day very less biomass was observed, on fourth day biomass increased by about two times.

Growth on Carbon sources:-

Data in the Table -2 indicates that there was large variation in the growth of *Septoria lycopersici on* different carbon compounds. This fungus shows maximum growth on glucose followed by fructose, lactose, control. It shows minimum growth in dextrose as a carbon source, while in absence of carbon source there was no growth.

Growth on nitrogen sources:-

Effect of five nitrogen compounds were studied, data in the Table – 3 indicates that there was not large variation in the growth of *Septoria lycopersici* on different nitrogen compounds. This fungus shows maximum growth on potassium nitrate and barium nitrate followed by control and cobalt nitrate. The least growth was observed in nickel nitrate. In absence of nitrogen source in the medium resulted in lowest growth as compared to other compound.

SUMMARY:

The growth and nutrition requirements of *Septoria lycopersici* was studied by growing the organism on Czapek- Dox liquid medium by either substituting or adding different compounds in the medium. The growth as dry biomass was observed on 8th day of incubation period. The growth rate of *Septoria lycopersici* in culture condition shows rapid growth during early stages and peak growth was observed on the 8th day of incubation period.

The great extent of variation was observed in the growth of pathogen on different carbon containing compound, maximum growth was recorded on glucose and minimum on dextrose.

Of the five nitrogen compounds were studied, maximum biomass was observed on potasium nitrate and least biomass on nickel nitrate. Results clearly indicate, that *Septoria lycopersici respond* differently to different carbon and nitrogen compounds.

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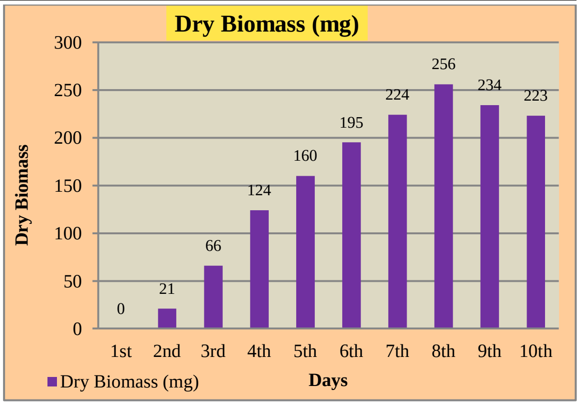
OBSERVATION TABLES & GRAPHS:

Table.1: Growth of *Septoria lycopersici* at various incubation periods grown on Czapek-Dox liquid medium.

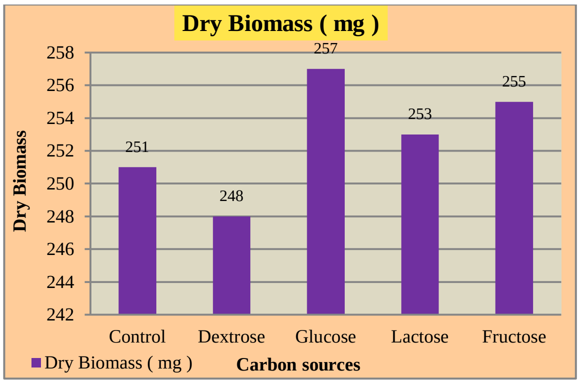
Incubation periods in days	Dry Biomass (mg)
1st	0
2nd	21
3rd	66
4th	124
5th	160
6th	195
7th	224
8th	256
9th	234
10th	223



Graph-1. Growth of *Septoria lycopersici* at various incubation periods grown on Czapek-Dox liquid medium.

Table. 2: Dry biomass of *Septoria lycopersici* grown on Czapek-Dox liquid medium containing different carbon sources at 8th day incubation period.

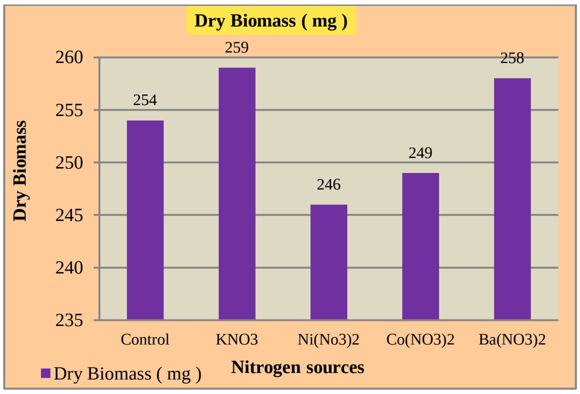
Carbon Sources	Dry Biomass (mg)
Control	251
Dextrose	248
Glucose	257
Lactose	253
Fructose	255



Graph- 2. Dry biomass of *Septorialycopersici* grown on Czapek-Dox liquid medium containing different carbon sources at 8th day incubation period.

Table. 3: Dry biomass of *Septoria lycopersici* grown on Czapek-Dox liquid medium containing different nitrogen sources at 8th day incubation period.

Nitrogen Sources	Dry Biomass (mg)
Control	254
KNO_3	259
$Ni(No_3)_2$	246
$Co(NO_3)_2$	249
$Ba(NO_3)_2$	258



Graph- 3. Dry biomass of *Septoria lycopersici* grown on Czapek-Dox liquid medium containing different nitrogen sources at 8th day incubation period.