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EFFECT OF CARBON AND NITROGEN SOURCES ON GROWTH OF *ALTERNARIA SOLANI* (ELL. & MART.) CAUSING EARLY BLIGHT OF TOMATO

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ABSTRACT :

In present investigation the effects of carbon and nitrogen nutrition on seven isolates of Alternaria solani(Ell.& Mart) isolated from different varieties of Tomato (Lycopersicon esculentum Mill.) was studied at 28˚c for ten days at ph 6.0. Among the seven carbon sources glucose for the isolate I & IV, Fructose for isolate IV & VI, Lactose for isolate IV & VII, Gelatin for isolate I , II,& VI, Manitol for III, V,&VI and Sucrose for the isolate II, IV,VI,& VII were found to be the best sources. Starch is poor for the growth of all the isolates. Among the seven Nitrogen sources sodium nitrate for isolate VII, Potassium nitrate for the growth of isolate I, IV, & VI, Peptone for the V th isolate, Ammonium Chlorite for VII and Ammonium Molybdate for I & VII isolate were found to be the best Nitrogen sources. Casin and Calcium nitrate are poor for the growth of all the isolates.

KEYWORDS : *Alternaria solani, tomato, carbon, &nitrogen sources.*

INTRODUCTION

Carban and nitrogen are essential elements for the growth and sporulation of fungi. Utilizationof carbon and nitrogen containing compounds by fungi depends on their ability to assimilate them,directly or after conversion in to simple compounds (Lilly and Barnet,1951). Tomato (*Lycopersicon esculentum* mill.) is an important commercial vegitable crop grown widely throught the world including tropical, sub tropical and temprate regions. English traders of East India company introduced tomato in India in1822.India is second largest producer of tomato next to China. Inbig group of vegitable belongs to solanaceous crops tomato occupy a distinct position for their spectularly, high productivity and commercial value obtained in the market.As a processing crop,tomato ranks first among vegetables. The production of tomato has tremendously increasing due to its multifarious uses in raw, cooked and processed forms as soups, sauces, ketchups, preservers and pickles (Tiwari and Choudry,1986). Tomato is known for its outstanding nutritive value. It is a masure source of vitamins A, B, and excelant source of vitamin C. It is also a good source of minarals like Ca, Fe, Mg, K, and Zn. The pulp and juce is prompter of gastric secrtion and blood purifier and considered to be intestinal antiseptic (Bose et al, 1993).

The association of phytopathogenic micro-organisms with this crop is perhaps as old as civilization. Among these organism fungi hold a significant place and are important as the pathogens. These fungal pathogens incite various types of diseases on their host crops and cause heavy economic losses annually throughout the world. Among the fungal diseases early blight disease caused by *A. solani* is one of the most destructive disease. It is becoming more severe in tomato growing fields of India and also in Maharashtra.
Datar and Mayee (1981) observed that among all fungal diseases infecting tomato crop, Early blight caused by *Alternaria solani* is most destructive disease and leads to noticeable heavy losses in yield of tomato fruits sometimes as high as 78 per cent.Choi and Park (1982) conducted a survey of crops grown in plastic houses during 1981-1982 summer season and observed that *Alternaria solani* were serious pathogens of tomato seedlings.Karla and Sohi (1985) conducted regular surveys of the markets during 1980-1984 and reported that 78 post harvest fungal disease on 36 vegetable crops belonging to 23 genera and they also referred that *Alternaria* sp.and *Fusarium* sp.was most frequent and destructive fungal pathogen.from different agro climatic

zones were selected for survey. They observed early blight caused by *Alternaria.*Uys *et al.* (1996) studied tomato diseases and disorders in the main tomato growing regions of South Africa during survey between 1992-1995. Early blight caused by *Alternaria solani*, was the most prevalent leaf disease, followed by bacterial leaf spot.Ramgiry *et al.* (1997) survey conducted and report that *Alternaria solani* and *Pencillium notatum* were the most frequent causal agents of tomato decay in fields and vegetable markets in Jhabua of Madhya Pradesh.Bhatt *et al.* (2000) recorded the *Alternaria alternata* as the causal agent of leaf blight disease of tomato and capsicum, which was the first confirmed record of this fungus from Kumaon hills of Uttar Pradesh.Kanjilal *et al.* (2000). Conducted the survey on field and post harvest diseases of hybrid and desi cultivars of tomatoes in four districts of West Bengal, (India) and revealed that among fungal diseases, the blight caused by *Alternaria* sp.was the most predominant with the crop loss in the field ranged from 70 to 100 per cent.Tumwine *et al.* (2002) conducted survey on tomato early blight situation and current practices for disease management in Uganda during 1996-1999. Ten districts *solani* as major disease.Kamble (2006) conducted a survey in Thane and Raigad districts in Konkan region of Maharashtra on early blight of tomato caused by *Alternaria solani* and recorded 33.80 and 47.75 that the per cent disease incidence in Raigad and Thane district respectively.

MATERIAL AND METHODS

In the present investigation the infected tomato (*Lycopersicon esculentum* Mill) plant material(Leaves and fruts) collected from Marathwada Agriculture University, Parbhani, Dist. Parbhani (M.S.) The *A. Solani* pathogen was isolated(Aneja 2007) and identified(Subramanian1971).The pure cultures of the pathogen maintained on PDA slants. The *A. solani.* The pathogen isolates were cultured on basal medium containing glucose 10 g, potassium nitrate 5g, potassium dihydrogen phosphate 1g magnesium sulphate 0.5g and distilled water to make 1000 ml. Glucose and potassium nitrate in the medium were replaced by different carbon and nitrogen sources respectively soas to supply an equivalent quantity of carbon and nitrogen. The medium was autoclaved and Ph was adjusted to 6.0. Each flask containing 25 ml of the medium was inoculated with fungal species and incubated for 10 days at 25◦ C, filtered, mycelial mat was dried andmycelial dry weight was recorded.

RESULTS AND DISCUSSION

The result obtained are presented in table 1 and 2. Among the seven carbon sources glucose for the isolate I& IV, Fructose for isolate IV & VI, Lactose for isolate IV,&VII, Gelatin for isolate I,II,&VI, Manitol for III, V,&VI and Sucrose for the isolate II, IV,VI,&VII were found to be the best sources. Starch is poor for the growth of all the isolates. Among the seven Nitogen sodium nitrate sources for isolate VII, Potassium nitrate was the best sources for the growth of isolate I, IV,&VI, Peptone for theV th isolate, Ammonium Chlorite for VII and Ammonium Molybdate for I&VII isolate were found to be the best Nitrogen sources. Casin and Calcium nitrate are poor for the growth of all the isolates.Hadge et. al. (1990) observed the glucose and sucrose as good carbon source for the growth ofColletotricum gloeosporides, isolated from ereca nut. Bhandari and Singh (1976) reported glucose as better source of carbon for growth of *Alternaria tritincina.* Pande and shukla (1978) observed better growth of Helminthosporium on sucrose . These findings support present study similar results were also reported by Reddy (1972). Kaif and Tarr (1966) Agarwal and Shinkhede (1959) and Singh (1972).Fungi utilize both inorganic and organic sources of nitrogen (Cochrane,1958;Bilgrami and Verma,1978).among inorganic sources nitrates, are more popular nitrogen sources for number of fungi. Amonium nitrate has also been reported as a fairly good nitrogen source for growth and sporulation of *Alternaria solani* The growth of all the seven fungi was significantly higher under the the influence of potassium nitrate , peptone and calcium nitrate. Peptone was the best organic nitrogen source as it represents mixture of amino acids, as also reported by Cochrane (1958). Similarly, increased growth of Alternaria solani was reported by Ghosh (1969).

Table: 1 Effect of Carbon sources on *Alternaria solani*. (Ell. And Mart)

Sr.No.		Dry wt. of mycelia l mat(Mg) of different isolates of *A.solani*Isolate.						

Table: 2 Effect of Nitrogen sources on *Alternaria solani*.(Ell.and Mart.)

Sr. No.		Dry wt. of mycelia mat(Mg) of different isolates of *A. solani*.						

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