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Studies of different Carbon and Nitrogen Sources on the growth of *Colletotrichum capsici,* the causal organism of Anthracnose of Chilli (*Capsicum annum*)

Anil Kumar Kushwaha

Abstract
The different carbon source tested, the pathogen preferred monosaccharide and oligosaccharides for nutrition. Maximum growth was recorded on maltose followed by glucose, fructose and sucrose. Disaccharides were good but polysaccharides not good sources. Among nitrogen sources, the pathogen preferred potassium nitrate followed by sodium nitrate and asparagines. Lead nitrate and ammonium chloride supported least growth.

Keywords: Carbon and Nitrogen, *Colletotrichum capsici, Capsicum annum*

1. Introduction
Anthracnose of Chilli (*Capsicum annum*) caused by *Colletotrichum capsici* is prevalent where Chilli is grown and it is major post harvest disease during transit, storage and market. The fungus derive food and energy from the substrate upon which they grow in nature, in order to culture the fungus in the laboratory, there is no universal substrate or artificial medium upon which all the fungi can grow and reproduce. Therefore studies were conducted in different suitable media to identify surface medium for the growth and sporulation of *C. capsici.*

2. Material and Methods
The carbon and nitrogen sources in kirchoff's medium were replaced by other carbon and nitrogen compounds ton get a concentration of 30 gm. and 2 gm. respectively in the all cases. The medium without C and N sources were maintained to serve as controls. The media sterilized at 15lb\sq inch were poured in 4'' sterilized Petri dishes and after solidification were inoculated with mycelial disc method from well sporulating culture. Petridishes were incubated for 8 days at 30±1˚C after which radial growth was measured. Degree of sporulating was indicated on the basis of spores present in lower power of microscope, poor (1-20), fair (21-40), good (41-60) and excellent (above 60).

3. Results and Discussion
The data given in **Table –I and II** revealed that among the different carbon sources tested during present investigation, monosaccharides and oligosaccharides were preferred by the pathogen. There was no growth of pathogen in complete absence of carbon source. The vegetative growth was maximum in maltose followed by glucose, fructose and sucrose, hexose, and disaccharides were found good for growth of the pathogen. Most fungi appear to utilized sugar with greater facility than alcohol. It was not found to be true in the present investigation for mannitol which was a sugar alcohol carbon source.
Maltose has been efficiently utilized by present pathogen. Hydrolysis of oligosachharides results in the formation of mono and disaccharides which are readily utilized. Maltose as a preferential carbon source to pathogenic fungi particularly *Colletotrichum lindemuthianum* (Tandon and Chandra, 1992) [7]. Has been reported in the literature. The results of present study were is conformity with finding of Ahmed *et al.* (2002) [1], Tripathi (2006) [8] Ekbote, S.D., Padaganur, G.M. *et al.* (1997) [2, 3] and Uday kumar and Usha Rani (2010) [9] however

Reported mannitol and Fructose to be better source for *colletotrchum* spp. causing anthracnose of mango.

Table 1: Effect of different Carbon Sources on the growth of *Colletotrichum capsici* 25±1˚C

S. No	Carbon Sources	Mycelial Growth (MM)	Degree of Sporulation (VISUAL)
1.	Maltose	85.50	Exellent
2.	Glucose	75.40	Exellent
3.	Fructose	65.00	Exellent
4.	Sucrose	62.00	Exellent
5.	Mannitol	44.50	Good
6.	Lactose	39.40	Fair
7.	Starch	15.00	Poor
Control (without carbon)		00.00	-
SEm±		1.50	-
CD(P=0.05)		2.80	-

Table 2: Effect of different Nitrogen Sources on the growth of *Colletotrichum capsici* 25±1˚C

S. No	Nitrogen Sources	Mycelial Growth (MM)	Degree Of Sporulation (VISUAL)
1.	Potassium nitrate	75.00	Excellent
2.	Sodium nitrate	65.00	Excellent
3.	Asparagin	55.40	Good
4.	Barium nitrate	45.00	Good
5.	Ammonium nitrate	39.50	Fair
6.	Lead nitrate	30.20	Fair
7.	Ammonium chloride	20.00	Poor
Control (without carbon)		00.00	-
SEm±		1.80	-
CD(P=0.05)		3.90	-

Nitrogen being the essential element, is utilized by fungi in some from or the other for their mycelia growth and sporulation. In the present investigation, all the forms of nitrogen supported good growth of pathogen expect lead nitrate and ammonium chloride. No growth of pathogen was observed in the medium without nitrogen source. Sporulation of pathogen also varied in different nitrogen sources. In general, nitrates proved to excellent sources of sporulation, particularly Potassium and Sodium nitrates. However difference in the value of various types of nitrates is obviously due to different cations involved in these compounds. The capacity to use nitrate by fungi actually depends upon their nitrate reductase activity. The reason for good growth of the pathogen by nitrates may be explained on this basis of the fact that nitrates are not toxic and utilized more easily. In fact nitrates are first converted into ammonia and than absorbed.

Ammonium compound generally toxic and there for are inferior sources in there nutritive value. Ammonia enters and leaves the cell by passive diffusion as undissociated ammonium molecule. Rapid fall in pH in this process due to assimilation of ammoniac nitrogen resulted in retardation of growth. However support of growth of pathogen by ammonium compound may be credited due to formation of assailable glutamic acid. Similar observation has been made by Rajak (1983) [6] and Naik (1985) [5] and Ekbote (1994) in case of *C. gloeosporioides.* The nitrate compounds are excellent nitrogen sources for imperfect fungi and also ascomycetes (Bilgrami and Verma, 1978) [4].

4. References

1. Ahamad S *et al.* Effect of temperature, pH, light and incubation period on the growth, sporulation, biomass and gibberellic acid production, *Ann. Pl. Protc. Sci* 2002; 10:343-348.
2. Ekbote SD, Padaganur GM, Patil MS, Chattannavar SN. Studies on thecultural and nutritional aspects of *Colletotrichum gloeosporioides*, the causal organism of mango anthracnose. *J. Mycol. and Pl. Path* 1997; 27:229-230.
3. Ekbote SD, Padaganur GM, Patil MS, Chattannavar SN. Studies on the cultural and nutritional aspects of *Colletotrichum gloeosporioides*, the causal organism of mango anthracnose. *J. Mycol. Pl. Path* 1997; 27:229-230.
4. Biligrami KS, Verma RN. *Physiology of fungi*, Vikas Publishing House Pvt. Ltd., New Delhi, 1978, 493.
5. Naik MK. Studies an anthracnose of betelvine (*Piper betel* Linn.) caused by *Colletotrichum gloeosporioides* (Penz.) Penz. And Sacc. *M.Sc (Agri.) Thesis*, Uni. agric. Sci., Bangalore, India, 1985.
6. Rajak RC, Nutritional requirements of two species of *Colletotrichum. Acta Botanica*, India 1983-11:155-160.
7. Tandon RN, Chandra SS. Physiological studies ofn pathogenic fungi, pro. Nat. Acad. Sci. India 1992; 31:391-398.
8. Tripathi SK. Isolation and characterization of three distinct biotpes gammarace of *Colletotrichum lindemuthianum* from white beans, Micribios 2006; 48:187-192.
9. Uday kumar, Usha Rani Epidemiological and nutritional factors on growth of *Colletotrichum gloeosporioides (Penz) Sacc. Ann. Pl. Protc. Sci* 2010; 18:159-163.