©Verlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum.at

Carbon requirements of Alternaria solani (Ell. & Mart.) Jones and Grout, the incitant of early blight of Potato

P. C. Lodha[1]) and N. Prasad[2])

Early blight caused by *Alternaria solani* (Ell. & Mart.) Jones & Grout is the most devastating disease affecting the potato crop in India. Losses upto 50% have been observed in Ajmer, Alwar, Jaipur, Kota and Udaipur districts of Rajasthan (India). Although investigations on epidemology and control of early blight of potato has been carried out in some detail, very little is known about the Myco-physiology of this pathogen. The present communication reports the influence of different carbon sources on the growth and reproduction of a local isolate of this incitant.

Material and Methods — From the basal medium (Richard medium) Sucrose was replaced by different carbon compounds. Quantity of an individual carbon compound added to the medium was determined on the basis of its molecular formula so as to apply the same amount of carbon per litre of the medium as that supplied by 50 g of Sucrose. pH of the medium was adjusted to 6.5 with the help of diluted solutions of NaOH and HCl and finally checked by pH-meter. Twenty ml of the medium was apportioned in each of the 150 ml Erlenmeyer flasks, which were sterilized at 15 lbs pressure for 20 minutes. Sterilized medium in each of the flasks was inoculated with single germinating spore obtained from a monoconidial culture of the pathogen on P. D. A. Inoculated flasks were incubated at $28 \pm 2°$ C for 15 days. Whatman filter papers dried to constant weight at 60 ° C were used for filtration and dry weight determination of the mycelium. A drop of suspension was also viewed under low power of a microscope. Number of spores were counted with the help of haemacytometer, the average of 4 such readings calculated. Each treatment had 5 replicates.

Results and discussion

Studies of Lilly and Barnett (1953) and Steinberg (1939, 1950) have clearly established that fungi differ in their ability to utilize different carbon sources. Tondon and co-workers (1961) have reported fructose to be a good source of carbon for various fungi studied

1) Research Assistant, Plant Pathology Section, Government Agricultural Research Station, Durgapura, Jaipur-4 (India).

2) Dean, Rajasthan College of Agriculture, University of Udaipur, Udaipur (India).

©Verlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum.at

by them. Our isolate showed poorest growth on fructose among the monosaccharides. This is not surprising, as different species of the same fungus or even the different strains of the same species may differ in their ability to utilize the same carbon compound. Lilly and Barnett (1951) found Galactose to be an unsatisfactory source for many fungi studied by them. It was interesting to find that Galactose was

Table 1

Growth and sporulation of *Alternaria solani* on different carbon sources

S. No.	Carbon source		Sporulation	Final pH
Monosaccharides				
(a) Pantose				
1.	L-Xylose	134,2	+ + +	3,6
2.	Arabinose	129,5	+ + +	3,2
(b) Hexose				
3.	Dextrose	143,5	+ + ++ +	3,9
4.	Fructose	111,5	+ + +	3,6
5.	Galactose	135,2	+ + +	3,0
6.	Mannose	117,0	+ + +	3,6
7.	Laevulose	126,5	+ + +	3,4
Disaccharides				
8.	Sucrose	197,7	+ + +	3,4
9.	Lactose	140,5	+	3,2
10.	Maltose	139,5	+ + +	3,7
Trisaccharides				
11.	Raffinose	121,0	+ + +	3,3
Polysaccharides				
12.	Starch	140,2	+ + + +	3,8
Hexahydric alcohol				
13.	Mannitol	38,2	—	3,5
14.	Sorbitol	75,2	—	3,2
15.	Control	—	—	—

++++ = Excellent;
+++ = Good; ++ = Fair; + = Poor; — = Nil

next to dextrose among monosaccharides in growth and reproduction for the present organism. Like many other fungi this fungus displays maximum growth on the disaccharide Sucrose, which is known to break into readily available energy sugar. The trisaccharide Raffinose showed good growth and sporulation. This is in agreement with the findings of Tondon and co-workers (1961) with 3 species of *Gloeosporium,* namely *G. psidii, G. limetticolum* and *G. citricolum.* The polysaccharide starch which is a reserve carbohydrate in the plants proved to be most favourable for the growth and sporulation of this fungus. Of the two sugar alcohols tried, Sorbitol and Mannitol both showed feeble growth and no sporulation.

©Verlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum.at

References

1. Lilly, V. G. and Barnett H. L. (1951) „Physiology of fungi" Mc Graw Hill Book Co. Inc. New York and London.
2. — (1953) The utilization of sugars by fungi. West Virginia Univ. Agri. Expt. Stn. Bull., 362 T: 38.
3. Steinberg, R. A. (1939) Growth of fungi in synthetic nutrient solutions. Bot. Rev. 5: 327—350
4. — (1950) Growth of fungi in synthetic nutrient solutions, II. Bot. Rev. 16: 208—228.
5. Tondon, R. N. (1961) Physiological studies on some pathogenic fungi. Uttar Pradesh Sci., Res. Committee monograph, Allahabad, India 80 pp.

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: Sydowia

Jahr/Year: 1972/1974

Band/Volume: 26

Autor(en)/Author(s): Lodha P. C., Pathak V. N.

Artikel/Article: Carbon requirements of Alternaria solani (Ell. & Mart.) Jones and Grout, the incitant of early blight of Potato. 130-132