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Study of variation in sugar (carbohydrate) due to the infection of ripe wild and Hybrid Tomato by *Alternaria solani*. Ell & Mart.

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Abstract : Abstract: Present investigation deals with the purpose to examine the variation in sugar content after the infection of *Alternaria solani* in wild and hybrid Tomato.

Cultivation of Tomato is increasing day by day in India as well as abroad.Fruit rot is severe disease of tomato occurring all over the India in humid condition.The fungus *Alternaria Solani* of form class deuteromycetes is found associated with rot of Tomato in the field,transit and storage. Infection causes biochemical changes in the quality specially to its carbohydrate, protein,amino acid and ascorbic acid contents.

In this research it is investigated by taking the extract of fixed volume of tomato pulp of wild and hybrid at definite intervals to study about the variation in sugar detected and estimated by qualitative as well as quantitative analysis by chromatographic and spectrophotometric method.

Key Words: Chromatographic,Deuteromycetes, spectrophotometric.

INTRODUCTION

We all know that Tomato is a popular vegetable used by Indian people.The plant of Tomato is belongs to the family Solanaceae. Botanical name of Tomato is Lycopersicon esculentum.MILL.Fruit is of berry type having axile placentation of two more chambered, multiseptate with swellen placenta. Tomato cultivated in fields by farmers in huge scale. It attack by a disease called "Early Blight Disease." Infection of this disease caused by a pathogen called Alternaria Solani Ell & Mart, by Jones & Grout of form class Deuteromycetes.

Symptom shows 3 to 4 weeks after the crop is sown,small scattered pale brown to dark spots, oval or angular shaped mostly 3 to 4mm in diameter. At first water soaked area is found. Then chlorosis takes place followed by necrosis in the spots. Spot shows a series of concentric ring like structure called 'Target board effect '. In severe attack causes rotting of leaves, fruits and other parts and ultimately plant dies.

The present study is of variation of sugar due to the attack of *Alternaria Solani* . Healthy Tomato of wild and hybrid of two cultivars were inoculated by the spore of *Alternaria Solani* and examined at regular intervals till rotting which will show the exact data of rate of increase or decrease of sugar content due to the attack of the pathogen.

MATERIALS AND METHODS

The spores or conidia of *Alternaria Solani* were collected from the "National Centre of Fungal Taxonomy" (*Ncft) Ref No-1420.08* for comparison of fresh isolates of *Alternaria Solani* inoculated in wild and hybrid Tomato.

The present research involved a number of standard methods available in the published paper and standard books.

For qualitative analysis, paper chromatographic method applied and for quantitative analysis Colorimetric / Spectrophotometric methods were involved. For experimental work common laboratory equipments were also used. Various types of chemicals also used for

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preparing different media and chemical analysis. Potato, Dextrose & Agar was used as basal cultural medium for preparing the pure culture.

At first five types of sugars run individually for detection of *Rf* values . Sugar solutions were plotted on separate Whatman chromatography paper No-1. *Rf* values of all the sugars were estimated at a temperature of 27 degree C +2 degree C at pH-7.1. The sugars taken were Glucose, Fructose, Sucrose, Maltose etc. After completion of run using specific solvent they were then exposed to iodine vapour. The chromatograms after development were dried at 60 degree C. *Rf* values were determined.Thus standard chromatograms were prepared.

5gm of fruit pulp were taken from infected portion and healthy portion of infected tomato and also from healthy tomato of wild and hybrid type,At every second day in incubation,fruit tissues were boiled with 50ml ethanol for 10min.The tissue pulp was then homogenized in the homogenizer.It was then taken in 150ml beaker.A bout 10ml absolute alcohol was added to it.The beaker was then heated for half an hour on a hot water bath.By using centrifuge the filtrates were collected in separate sterilized bottles as sample .Spots were plotted in separate chromatographic paper for exact determination of sugar.Comparision with the standard chromatograms established the identity of sugars,subsequently obtained in various studies.

For quantitative analysis at first standard glucose solution was made.After preparing ,fixed volume of stock solution,5%phenol and 96%H2SO4 is added.

Different volumes are made for the experimental work.Those are kept at 25degrees to 30degree C for 20min after shaking and optical density were measured at 490mm.

5gms fruit pulp was taken from which sample made for experiments at every 2nd day of incubation .From that known fixed volume of sample was taken in which water ,phenol and H2SO4 of known volume were added. Optical density were measured and ppm found out.

RESULT AND DISCUSSTION

The variation of sugar content in infected,healthy portion of the infected tomato and complete healthy tomato sample is shown in the graph.In first day of Wild&Hybrid type,infected portion shows significant low value than the healthy portion of infected one and complete healthy one.As the infection of pathogen increases,the amount of sugar shows high level.

The nature of variation in the sugar content in wild and hybrid of the three is more or less identical for 14 days.

Table -1 Calculated data of sugar wild

INFECTED PORTION		HEALTHY PART OF INFECTION		NON INFECTED (CONTROL)	
Days	PPm	Days	ppm	Days	ppm
2	58	2	118	2	118
4	80	4	142	4	207
6	54	6	80	6	182
8	24	8	60	8	96
10	08	10	72	10	176
12	16	12	08	12	80
14	06	14	20	14	60

Table – 2: Calculated data of sugar hybrid

INFECTED PORTION		HEALTHY PART OF INFECTION		NON INFECTED (CONTROL)	
Days	PPm	Days	ppm	Days	ppm
2	92	2	208	2	200
4	166	4	160	4	214
6	180	6	68	6	206
8	128	8	72	8	206
10	120	10	78	10	168
12	76	12	56	12	144
14	10	14	54	14	168

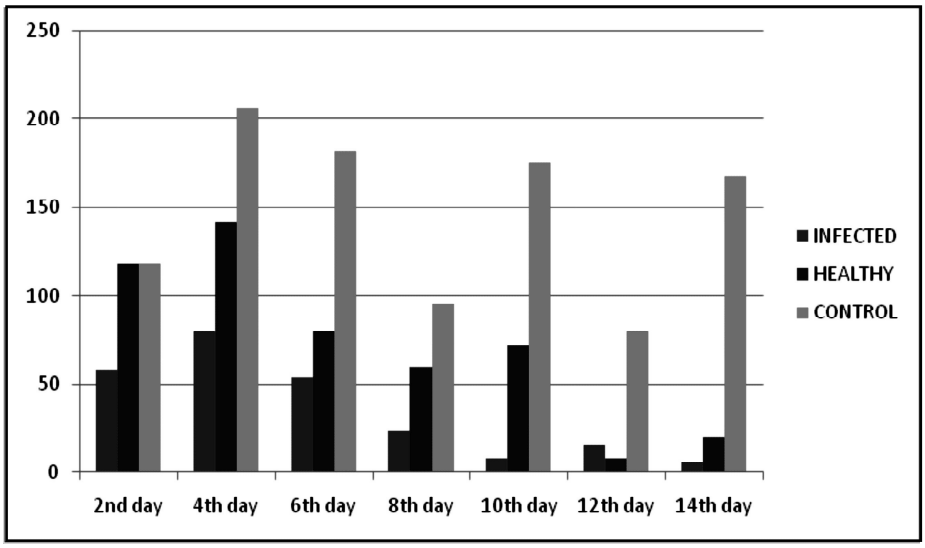

Fig.1. Column graph showing comparative data of sugar of wild Tomato.(days/ppm)

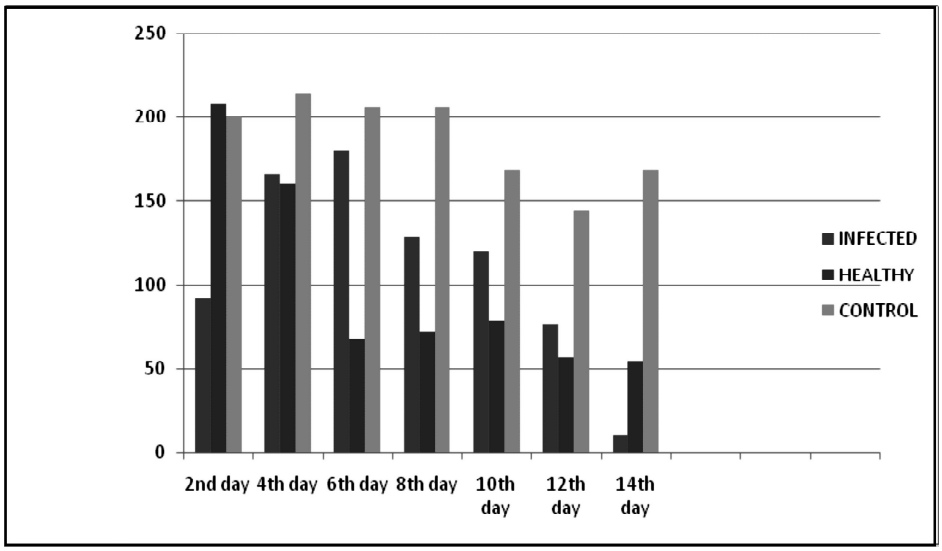

Fig.2. Column graph showing comparative data of sugar of hybrid Tomato.(days/ppm)

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