inoculated daily in a culture medium (which contained 10 g. of starch, 3·5 g. of KNO_3. 1·75 g. of KH_2PO_4, 0·75 g. of $MgSO_4 7H_2O$, and distilled water 1 litre). The filtrate of each day was analysed chromatographically by the method described by Giri (1952). *n*-Butyl-alcohol-acetic acid and water (4 : 1 : 5) was used as developing solvent, while aniline diphenyl amine phosphoric acid (5 vols. of 4% aniline, 5 vols. of 4% diphenyl amine and 1 vol. of phosphoric acid) served as spray reagent.

The results showed that during the growth of these organisms, the starch was not only converted into maltose R_f 0·55 and glucose R_f 0·68 (the normal hydrolytic products of starch), but three other oligosaccharides (R_f 0·45, 0·37 and 0·3 respectively) also appeared in the culture medium (*vide* Fig. 1, bands III, IV and V respectively).

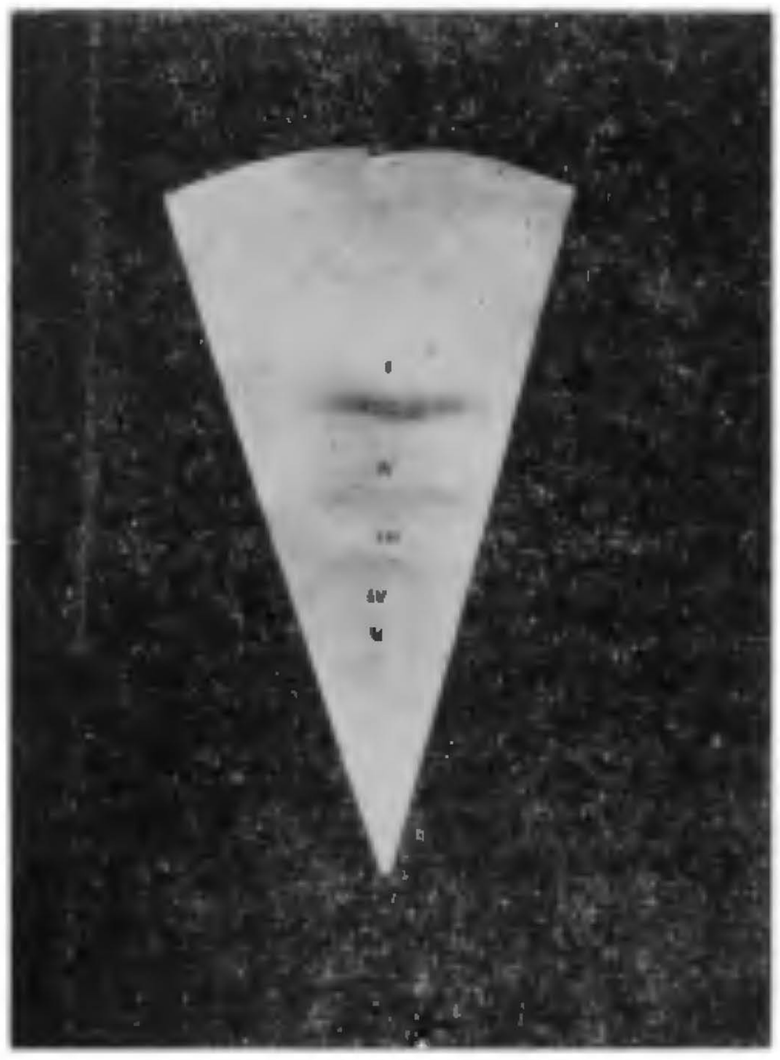

FIG. 1. Chromatogram showing the formation of glucose (Band I), maltose (Band II) and 3 oligosaccharides (Bands III, IV and V) during the growth of *P. cycadina* in the culture medium containing starch.

THE UTILIZATION OF STARCH BY TWO SPECIES OF *PHYLLOSTICTA*

STARCH is the reserve carbohydrate in plants. Nearly all starches are composed of a mixture of two different kinds of polysaccharides, *viz.*, amylose and amylopectins, both of which give D-glucose on complete hydrolysis. Generally the parasitic fungi convert starch of the host cell into glucose before utilization. This conversion is caused by *amylases* which cause splitting of the glycosidic bond in the polysaccharide unit.

Four types of changes are brought about in the culture medium during the disintegration of starch : (1) a decrease in the viscosity denoting cleavage in the polysaccharide chain, (2) loss in the capacity to give blue colour with iodine, (3) appearance of reducing groups, (4) formation of maltose, glucose and additional oligosaccharides of varying chain-length.

Single spore cultures of *Phyllosticta cycadina* (Pass) and *P. artocarpina* (Syed *et* Butl), were

Hopkins (1946) classified the *amylases* into two broad groups, *viz,* α and β *amylases.* According to Hopkins the β *amylsaes* rapidly hydrolyse the amylose fraction of starch to maltose. This conversion is practically quantitative and only negligible amounts of oligosaccharides are formed. In contrast to β *amylases* the α *amylases* cause a rapid loss in the capacity of amylose to give blue colour with iodine and the rate of appearance of maltose is very slow. This indicates that in the present case the α *amylases* attack the interior chain of the glycosidic linkage and induce the formation of oligosaccharides.

The chromatograms clearly established that maltose was produced slowly in the culture medium. The results also established the formation of three synthetic oligosaccharides. Iodine test revealed that the growth of *P. cycadina* and *P. artocarpina* caused the disappearance of the starch of the culture medium on 3rd and 4th day respectively. These results further establish that these two species of *Phyllosticta* hydrolyse starch by α *amylases*.

Detailed investigations are in progress and the results will be published elsewhere.

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