Research Paper :

Production of lipase enzyme by seed borne fungi of groundnut

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SUMMARY

Fungal association in deterioration of seeds can better be correlated with the production of extra cellular hydrolytic enzymes. Therefore, seed borne fungi of groundnut were screened for their ability to produce lipase enzyme. Experiments on the influence of physico-nutritional conditions on lipase production were carried out extensively in *Aspergillus flavus*, *Fusarium oxysporum*, *Macrophomina phaseolina*, *Alternaria alternata*, *Rhizopus nigricans* and *Sclerotium rolfsii*. The degree of enzyme production was found to be variable among the mycoflora. *A. flavus* and *A. niger* were found to be highly amylolytic. Effect of different substrates on lipase production was also studied. Different substrates used were edible oils, fats, carbohydrates and nitrogen sources. Oils of some crops proved stimulatory while at the same time oils of other crops exhibited inhibitory nature for lipase production. At the same time, in case of carbohydrates, most of them except a few were found to be stimulatory for lipase production.

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The chief groundnut growing regions are India, China, Indonesia, West Africa, USA and France. India occupies the top position in the world with regard to acreage and production of groundnut.

Seeds are generally associated with certain saprophytic or parasitic microorganisms which perpetuate in the seed lots on the advent of favorable conditions. Fungal association in deterioration of seeds can better be correlated with the production of extracellular hydrolytic enzymes (Agrawal and Kharlukhi, 1987). Therefore, 12 pathogenic moulds were screened for their ability to produce lipase in particular. Groundnut seeds are rich source of oils hence, the vigour of pathogenic fungi in the process of biodeterioration of these seeds may be related to the degree of lipase production.

MATERIALS AND METHODS

Selected seed moulds were studied for their ability to produce lipase enzymes.

Lipase production:

Lipase production was studied by using liquid medium containing 1 % Oil, KNO_3 0.25 %, KH_2Po_4 0.1 % and $MgSo_4.7H_2O$ 0.05 %, pH 5.0. Rest of the details were same as in case of amylase.

Enzyme assay (Titration):

The activity was assayed as described by Schneider (1957). The reaction mixture contained 2 ml of glycerol triacetate (Triacetin), 5 ml of 0.2 M Citrate phosphate buffer at pH 8.0 and 2 ml of enzyme source, incubated at $36^0C \pm 1^0C$ for 3 hours. The reaction was terminated by adding 10 ml of absolute alcohol. The amount of acids produced by the activity of enzyme was estimated by titrating against 0.05 N NaOH using 1 % phenolphthalein (1 ml) as an indicator till the development of pink coloration. Reaction mixture soon after the addition of enzyme served as blank. The enzyme activity was expressed in units, one unit is defined as 0.1 ml of 0.05 N NaoH required to neutralize the fatty acids liberated during incubation.

RESULTS AND DISCUSSION

The results obtained from the present