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Comparative study of extracellular amylase production by *Aspergillus niger* and *Aspergillus flavus* and effect of temperature and metal ions on enzyme activity

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Abstract : *A comparative study of production of extracellular amylase was carried out with Aspergillus niger and Aspergillus flavus. Different temperature and pH were provided to the test organism to optimise the enzyme production. Amylase activity was determined using DNS method suggested by Miller (1972). Maximum enzyme activity was observed at temperature 40°C and pH 7.0 for A. niger. The optimum temperature for the activity of amylase produced was obtained at 30°C with optimum pH at 7.0 for A. flavus. The results showed that A. niger is a good producer of extracellular amylase at a relatively higher temperature. This provides an insight that amylase produced would be thermostable in nature. Studies involving the effect of temperature on amylase activity showed that A. niger had maximum amylase activity at 50°C i.e. 0.287 U/ml. A. flavus had an enzyme activity of 0.33 U/ml at 40°C which was recorded as maximum. Thus, amylase produced by A. niger has been found to be more thermostable than that of A. flavus. Effect of metal ions on amylase activity was evaluated. Calcium ions at concentration of 0.1mM has inducing effect on enzyme activity in both the organisms, A. niger (0.268 U/ml) and A. flavus (0.398 U/ml). However concentration of 0.1µM has more inducing effect in case of A. flavus. Magnesium ion has inducing effect to the extent of 0.342 U/ml for A. niger but enzyme activity decreased to the extent of 0.319 U/m in A. flavus. Activity of enzyme amylase from A. flavus (0.425 U/ml) highly increased in presence of Zinc ion at concentration of 0.1µM, however it has slight inducing effect on A. niger (0.319 U/ml). Mercury ion has an inhibitory effect on the amylase activity. Therefore, depending upon the conditions and substrates available, Aspergillus niger and Aspergillus flavus could be utilized for amylase production for industrial purpose.*

Key words: *Enzyme amylase, Aspergillus niger, Aspergillus flavus, temperature, metal ions.*

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