Scientific Bulletin. Series F. Biotechnologies, Vol. XVII, 2013
ISSN 2285-1364, CD-ROM ISSN 2285-5521, ISSN Online 2285-1372, ISSN-L 2285-1364

GROWTH AND ACTIVITY OF CELLULASE-AMYLASE ENZYME *PENICILLIUM NALGIOVENSE* AND *ASPERGILLUS TAMARII* MOLDS ISOLATED FROM COW RUMEN FLUID

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Abstract

Cow rumen fluid is a fluid rich in cellulolytic microbes that play a role to help digest food that contains high crude fiber. Two species of moulds have been isolated from the cellulolytic rumen fluid of local cattle and have identified as Penicillium nalgiovense and Aspergillus tamarii. Cellulolytic Index both of Penicillium nalgiovense and Aspergillus tamarii were 2.33 and 1.24 respectively. The purpose of this study is to characterize their growth and activities of cellulase and amylase. Research include: 1) growth of mould 2) macroscopic description, and 3) activities of cellulase and amylase enzyme using the DNS (3,5-dinitrosalicylic acid) method. Based on the growth curve is known that the logarithmic phase of growth of Penicillium nalgiovense peak occurred on day 6 with a population of 9.696 x 10^3 cfu cells, whereas Aspergillustamarii logarithmic phase, occurred on day 5 with a population of 4.65 x 10^2 cfu cells. Cell morphological characters of P. nalgiovense as conidium colour milky white, and spore powdery, in the early growth of Penicillium nalgiovense white colonies after a while the colonies get old is also white and conidiophores with smooth stipe. As macroscopic A.tamarii is yellow-brownish, at the beginning of growth colonies colour is a bright yellow growth after several days, color were changed to dark brownish yellow. This mold has a conidial head yellow-brown, not columnar and have ornaments that are not clear. Cellulase enzyme activity in Penicillium nalgiovense amounted to 2.420 units / ml, and amylase enzyme activity of 2.146 units / ml. Aspergillustamariii to be used for degradation of fiber for feed.

Keywords: *description, characteristic, cellulose and amylase enzymes activity, Penicilium nalgiovense, Aspergillus tamari, cow rumen fluid.*

INTRODUCTION

Superior microorganisms which can be used as a source of enzymes as well as fermentative microorganisms can be isolated from a natural source. Natural sources are sources such as cow rumen fluid derived from the Slaughterhouse waste (RPH), because they contain different types of enzymes that can break down the most complex structure in the fodder. Jovanovic and Cuperlovic (1977) states rumen microbes can increase the nutritional value of food due to microbial protein, resulting in increasing digestibility. In addition, rumen is a source of polysaccharide degrading enzymes due to synergistic effects and interactions of complex microorganisms, mainly producers of cellulase and xylanase (Trinci et al., 1994).

Andriani (2010) isolated a fungus cellulotik of local cattle rumen fluid, and got the results that based on cellulotic index (CI), *Penicillium nalgiovense* and *Aspergillus tamarii* are molds that have the largest cellulotic ability among all aerobic fungi isolated, respectively 2.33 and 1.24. The cellulolytic potential can be utilized in the process of pre-digestion of the coarse fiber in the form of cellulose, hemicellulose and lignin, which are abundantly found in waste cellulose, so that at the time of entry into the body of the fish it is already available in a form that is more easily digested, for example in the form of poly or oligosaccharides.

Enzymes have a specific ability to degrade the material according to its kind. These