

Kritsadakorn Jarimophat 2006: Alkaline Protease Production from Alkalophilic *Bacillus* sp. by Submerged Culture. Master of Science (Microbiology), Major Field: Microbiology. Department of Microbiology. Thesis Advisor: Assistant Professor Patoomporn Chim-anage, D.Eng. 142 pages.
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Bacillus sp. A39, the alkaline protease producing bacteria isolated from soil in Thailand, was cultivated in BMSM liquid medium by batch culture. The study was carried out in 5 L jar fermentor, at 300-550 rpm agitation speed and 1 VVM aeration rate with addition of pure oxygen in some cases. The results revealed that cultivation of *Bacillus* sp. A39 in medium containing 2% glucose, 0.25% skimmed milk and controlling pH at 9.5 and dissolved oxygen concentration at 80% air saturation were the most suitable. Consequently, the specific growth rate (μ) and specific alkaline protease production rate (q_p) of 0.511 h^{-1} and 23,556 units/g cell.h were obtained, respectively.

We also found that *Bacillus* sp. A39 produced the highest enzyme activity when its growth was deceleration phase. Overfeeding of glucose tended to suppress the growth as well as alkaline protease production. According to these characteristics, the constantly fed-batch culture may be well suited to increase its productivity. The results showed that addition of double strength BMSM medium containing 4% glucose at dilution rate of 0.05 h^{-1} into the batch system at deceleration phase provided the highest μ and q_p of 0.048 h^{-1} and 28,484 units/g cell.h, respectively. As a result, total alkaline protease activity obtained was 4.5 and 1.18 times higher than that of batch culture containing 2% and 4.5% glucose in BMSM medium, respectively. Moreover, it could shorten the fermentation time by half (about 38 hours) when compared with batch culture operated in 4.5% glucose of BMSM medium.

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