MINIMIZING THE PROTEOLYTIC ACTIVITY OF ACID PROTEASE PRODUCED BY *ASPERGILLUS NIGER*

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Acid protease produced from *Aspergillus niger* shows both proteolytic and clotting activities. A suitable enzyme that could be used for cheese making should have decreased proteolytic activity with high clotting activity. If the proteolytic activity is high, the properties of the cheese prepared will be altered and would affect the standard cheese preparation such as excessive digestion of curd and less retention of fat in cheese. This will also leads to adverse effects on the body and flavour of the ripened cheese. Thus it is important to minimize the proteolytic activity. In this study our aim is to modify a protease produced from *Aspergillus niger* for cheese making. With a view to bring our enzyme very close to calf rennet, attempts were made to increased the ratio of milk clotting to proteolytic activity by adding some metal salts. Clotting activity was increased by the addition of $ZnCl_2$, $CaCl_2$ and $ZnCl_2$ + $CaCl_2$ by 66, 25 and 42% respectively and there was no loss in clotting activity at 5 h. At 60 min and 55°C, 46% of the proteolytic activity was lost while the clotting activity of the enzyme was 166%. The proteolytic activity was increased by calcium ions, whereas clotting activity was influenced by Ca^{++}, Zn^{++} and Ca^{++} + Zn^{++}. When the crude culture supernatant was incubated with $CaCl_2$ for 5 h at pH 4.5 and 55°C, at zero time, proteolytic activity was increased by 10% and remained the same for 30 min. However further increase in incubation time decreased the proteolytic activity. In the control proteolytic activity decreased by 40% at 1 h and 100% at 5 h. Thus addition of Zn^{++} had no stabilizing effect on proteolytic activity. Acid protease lost 46% of the activity at 1 h and 100% of the activity at 5 h. How ever addition of $ZnCl_2$ + $CaCl_2$ retained 80% of the proteolytic activity at 5 h. From the results it can be concluded that Zn^{++} is sufficient to increase the clotting activity without influencing the proteolytic activity.