Substrate specificity of α-amylase isolated from *B. amyloliquefaciens* strain MDC1974

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Selection of microorganisms for the production of α-amylase is an important criterion in starch saccharification industries. As α-amylase sources, bacterial species, specifically *Bacillus* are the main choice of interest due to a number of their properties. From the economical point of view, digestion of the raw starches is the preferable property of this enzyme. Our studies indicate that α-amylase isolated from *B. amyloliquefaciens* strain MDC1974 (Collection of Microorganisms of the Scientific and Production Center "Armbiotechnology" NAS RA) is a raw starch hydrolyzing enzyme. Substrate specificity, raw and gelatinized corn and potato starch hydrolyzing dynamics have been studied by using purified α-amylase of *B. amyloliquefaciens.* Corn starch was the preferable substrate for α-amylase. After 24 hours of incubation at 55°C, the deepness of hydrolysis of raw and gelatinized corn starch was 63%. The enzyme reacted slowly with raw potato starch, whereas gelatinization made potato starch more digestible for the enzyme. The obtained results indicated that after gelatinization the substrate became more attainable for the enzyme, and 44% of the product was accumulated after 1 hour of incubation.

Analysis of the end product of corn starch by thin-layer chromatography (TLC) indicated that the main sugars arising after hydrolysis reaction were glucose and maltose (Fig. 1.). At the beginning of the reaction the G2-G7 were predominant products (Fig.), whereas at the end of the reaction the main products were glucose and maltose. Thus, it could be concluded that α-amylase of *B. amyloliquefaciens* is maltooligosaccharide-producing enzyme at the beginning of the incubation, though capable of producing mainly glucose and maltose after long periods of hydrolysis. Our results show that α-amylase of *Bacillus amyloliquifaciens* is able to complete hydrolysis of starch during 24 h.

In terms of application, this enzyme could be a potential candidate for complete hydrolysis of raw starch to glucose and maltose.