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Microbial Alkaline Proteases Isolated from South Caucasus

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Proteases represent one of the three largest groups of industrial enzymes and account for about 60% of the total worldwide sale of enzymes [1]. Protease stability to high temperature and alkaline conditions is of great value for their effective application as detergents and in leather industries [2]. Active producers of proteases were selected by screening under deep cultivation conditions among the collection of mycelial fungi at S.Durmishidze Institute of Biochemistry and Biotechnology, isolated from different ecological niches of Caucasus. To determine protease activity Anson's modified method was applied [3]. As a result of optimization of nutrient medium the activities of proteases produced by strains were increased by 22-50%.

Technical preparations of proteases were obtained by precipitation with $(\text{NH}_4)_2\text{SO}_4$ (70g/100ml). In order to define temperature optimums for protease enzyme preparations, enzyme activity was measured between 20-80°C with 5° intervals. In order to define pH optimums of enzyme activity, pH of incubation medium was changed from 2.0 to 12.0, by pH 0.5 intervals. Optimum temperatures of action of protease preparations from three producers - *Mucor* sp.T-44, *Penicillium* sp.To 1-10 and *Aspergillus* sp. P-39 were established to be within the range 60-70°C. Especially considerable are preparations from alkaliphile *Aspergillus* sp P-39 with pH optimum of action at pH 10.5 and *Penicillium* sp. 1-9 with pH optimum of action at pH 12.0. Performed experiments revealed that selected preparations of proteases can be successfully used in different branches of industry.

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