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KERATINOLYTIC ENZYMES: PRODUCERS, PHYSICAL AND CHEMICAL PROPERTIES. APPLICATION FOR BIOTECHNOLOGY

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[Abstract](#)

The aim of the review was to analyze the current ideas on keratinases, a group of proteolytic enzymes that catalyse the cleavage of keratins, which are highly stable fibrous proteins. Representatives of various taxonomic groups of microorganisms, including fungi, actinomycetes and bacteria, are keratinase producers. Modern classification of keratinases according to the MEROPS database is given.

The studies of physical and chemical properties of keratinases indicate that the enzymes are active in a wide range of temperature and pH values, with the optimal action at neutral and alkaline pH and $t = 40\text{--}70\text{ }^{\circ}\text{C}$. It was shown that microbial keratinases were predominantly the metallo-, serine- or metallo-serine proteases. They are usually extracellular, and their synthesis is induced by keratin substrates. The review discusses the practical use of keratinases. These enzymes have been successfully applied in bioconversion of keratin wastes to animal feed and nitrogenous fertilizer, as well as in leather, textile, detergent, cosmetic, pharmaceutical industries. Keratinases are also applicable as pesticides and in the production of nanoparticles, biofuel, biodegradable films, glues and foils. In addition, keratinases are used in the degradation of prion proteins which are able to cause a number of human and animal neurodegenerative diseases of spongiform encephalopathy.

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