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Stable cellulose degrading enzymes from thermotolerant fungi strains

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Search for energy from renewable resources is more urgent now than ever. In natural environments, fungi are the primary degraders of lignocellulosic biomass, excreting both hydrolytic and oxidative enzymes. The majority of cellulases used in biotechnology are still derived from well-characterized non-extremophilic microorganisms and there is a very little information regarding cellulases from extremophiles. An important drawback of these commonly used industrial enzymes is the lack of activity at even slightly elevated temperature and the tendency of these enzymes to denature at elevated temperatures or other critical conditions. Project is focused on obtaining stable enzymes from Durmishidze Institute of Biochemistry and Biotechnology, AUG unique extremophilic mycelial fungi collection for the creation of biotechnology of production of fuel-bioethanol from agricultural and industrial lignocellulosic wastes. Cellulase/xylanase producers, mesophil *Penicillium canescence* D 85 and thermophil *Sporotrichum pulverulentum* T 5-0 synthesizing extracellular enzymes with activities 185 U/g/1600 U/g and 110 U/g/840 U/g, correspondingly, have been selected. Optimum pH of action of the studied cellulase/xylanases was similar and equaled to 4.5-5.0. Simultaneously 21 basidial fungi strains have been selected as laccase producers. Using these enzymes allowed creation of the technology of glucose production from agricultural wastes by hydrolyzing of cellulose up to 80% or higher.

Biography

Giorgi Kvesitadze has completed his PhD from Bach Institute of Biochemistry, Moscow and Postdoctoral research at University of Pennsylvania, Philadelphia and Lehigh University, Bethlehem, USA. He is the Director of the Durmishidze Institute of Biochemistry and Biotechnology and Professor at AUG. He has been elected as a Member of GNAS in 1988. He is the author of more than 110 papers in reputed journals and has been serving as an Editorial Board Member of International journals: *Ecotoxicology and Environmental Safety*, *Fresenius Environmental Bulletin*, *EuroBiotech Journal*, *Journal of Biological Physics and Chemistry*, *Annals of Agrarian Sciences* and of national journal: *Bulletin of the Georgian NAS*.

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