Thermostable lipases

Abstract

The stability of biocatalysts is an important criterion when dealing with bioprocesses at high temperature in order to sustain its operational activity throught the processes. Much efforts has been focused on the screening of microorganisms harboring intrinsically stable biocatalysts. This chapter presents an overview of the issues involving screening, growth and production, purification and characterization of wild-type and recombinant enzymes with emphisis on thermostable lipases. High temperature, using olive oil as the sole carbon source, dictated the isolation of thermophilic lipolytic bacteria Geobacillus sp. strain T1 and Bacillus spp. strain 42 and strain L2.Tryptone and casamino acid were the best nitrogen sources, while corn oil and Tween 60 were the best substrates for the production of strain 42 lipase and L2 lipase, respectively. Molecular expression of thermophilic genes in mesophilic host not only reduced the exposure of recombinant enzymes to denaturing environment but facilitate protein purification and expression in bulk quantity in a shorter time. These lipases exhibited optimum temperature and pH of 70-80C and 7-9, respectively. These valuable properties create various potential industrial applications, particularly palm-based industry with respect to its high activity and substrate solubility at high temperature