PHYSIOLOGY AND BIOCHEMISTRY OF LACTIC ACID BACTERIA

Summary

Lactic acid bacteria (LAB) are a group of microorganisms encompassing bacteria with similar metabolic capacities. The process which enables them to gain energy is lactic acid fermentation, where lactic acid is the major product. Taking into consideration the type of fermentation, LAB can be divided into two groups – hetero- and homofermentative. Phylogenetically, LAB are comprised of 3 orders: Lactobacillales, Bacillales and Bifidobacteriales. Their evolutionary separation was preceded by the genetic adjustment to the environment rich in nutrients through the gain of genes encoding membrane transporters and the loss of genes encoding biosynthetic pathways. As auxotrophic organisms, they catabolise amino acids – i.e. arginine, methionine and phenylalanine, which can be turned into harmful metabolites such as ethyl carbamate or biogenic amines. Since lactic acid bacteria are ubiquitously used in biotechnology, the inability to produce such compounds by industrial strains must be confirmed.