A comparative analysis of preservation of functional food cultures by freeze-drying, liquid-drying and freezing methods

Abstract

There are various methods for long term preservation of microorganisms, including freeze-drying (F-drying), liquid-drying (L-drying), and freezing at -80°C or at -196°C. All these methods have been developed and used to avoid degeneration and mutation of strains. L-drying involves vacuum drying of samples from the liquid state without freezing, and it is known to be useful for the preservation of microorganisms that are sensitive to freeze-drying. In this study, all types of functional food cultures were preserved by three methods: freeze-drying, liquid-drying and freezing at -20°C, -80°C and -196°C. The viability and stability of each culture was examined at different stages: before preservation, and six months after preservation storage. This study demonstrated that there were more than 80% of preserved cultures managed to grow after six months of storage in all methods. The success of long term preservation was always depends on the growth rate and desiccation tolerance of the microorganism itself. However, growth media and protective agent also play very important role in viability and stability of the cultures.

Keyword: Freeze-drying; Liquid-drying; Freezing; Viability; Protective agent