Concentration of Cornelian cherry fruit juice by membrane osmotic distillation

Katalin Bélafi-Bakó*, András Boór

University of Pannonia, Research Institute on Bioengineering, Membrane Technologies and Energetics, Egyetem u. 10, 8200 Veszprém, Hungary
Tel. +36-88-624726; Fax: +36-88-624038; email: bako@almos.uni-pannon.hu

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ABSTRACT

The application of membrane technologies for food and beverage processing has considerably increased recently. Emerging technologies are in the status of breakthrough. To avoid degradation of certain natural antioxidant components, loss of amino acids and discoloration in the final product, an alternative membrane procedure – reverse osmosis (RO) – succeeded against the traditional multi-stage vacuum evaporation. Due to the development and improvements, a higher feed concentration can be reached by membrane distillation (MD) and osmotic evaporation (OE). These methods are developed for concentrated fruit juice production to improve quality and reduce energy consumption. This research introduces a coupled operation of MD and OE (membrane osmotic distillation, MOD) for an effective, but still mild concentration of valuable fruit juices. Fruit juice from Cornelian cherry (Cс) was investigated, with special regard to the preservation of valuable compounds. To make sure that the process is able to preserve the fruit’s high dietary value, antioxidant activity of the juice produced was determined and compared in each consecutive operational step. Cornelian fruits are good sources of natural antioxidants, containing many different radical scavenger components that provide protection against harmful-free radicals and, therefore, associate with lower incidence and mortality rates of cancer and heart diseases in addition to a number of other health benefits.

Keywords: Coupled membrane process; Antioxidant capacity

*Corresponding author.