

## Using Hybrid Method for Inactivation of Microorganism and Enzymes in a Berry Juice

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**Abstract :** The need for efficient nutraceutical products has been dramatically changing the approach of the industrial processes. The development of novel mild processes is highly demanded for the production of such products; especially when both quality and safety need to be guaranteed during their long shelf life. Within this research, for the first time, we investigated the effect of supercritical carbon dioxide treatment for the inactivation of microbes and enzymes in a berry juice possessing therapeutic effect. We demonstrated that a complete inactivation of microbes can be achieved at optimized conditions of treatment. However, the bottle neck of the process was represented by the unpromising inactivation of the degradative enzyme by supercritical carbon dioxide treatment. However, complete enzyme inactivation was achieved by applying two strategies: the first was optimizing juicing method by adding a mechanical step and the second strategy was addition of natural inhibitors to the juice. Overall these results demonstrate that our hybrid process has a significant effect on the inactivation of microorganism and enzymes in the fresh juice. The developed process opens the possibility for the evolution of new products with optimal nutritional and sensorial characteristics, as well as offering a competitive cost and an environmentally friendly alternative for pasteurization and extension of shelf life in a wide range of natural therapeutic products.

**Keywords :** hybrid method, berry juice, pasteurization, enzymes inactivation

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