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Analysis of natural red cabbage color concentrated using membrane filtration

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Statement of Problem: Membrane technology has become a potential technique to remove unwanted molecules and concentrate the natural colors without thermal treatment. However, this technology needs to be investigated for the efficiency and changes in ACNs quality throughout the process. The Purpose of this was to purify and concentrate ACN extract from red cabbage using membrane filtration; and to compare the color intensity, aroma, the antioxidant capacity, phenolic content and chemical composition of the purified anthocyanins.

Methodology: ACNs were extracted from red cabbage by constant agitation using a 0.5% HCl solution. The extracted suspension was centrifuged and clarified using Microfiltration (MF) membrane to remove any unwanted particles. The resulting permeate with color was collected and concentrated using Nanofiltration (NF). The final permeate and retentate were analyzed for composition and other characteristics. Reverse Phase High Performance Liquid Chromatography (RP-HPLC), colorimeter, antioxidant capacity and total phenolic content were used to evaluate any changes.

Findings: There was a 42% decrease in total phenolic content from raw sample to concentrated sample, while the antioxidant capacity remained the same at 16 mg/L throughout the whole process. No change in RP-HPLC was observed throughout the purification process indicating the concentration process did not affect ACNs composition. The NF membrane proved to have a good anthocyanin retention since no anthocyanin content was found in the permeate. Interestingly, the undesirable aroma from red cabbage was less intense in the concentrated sample as compared to the raw sample and will need further study.

Biography

Harmit Singh's research is focused on the promotion of more acceptable natural food ingredients and bio-friendly food processing technologies such as membrane and enzyme technologies. His recent projects include purification and concentration of natural food colors using membrane technology and evaluation of antioxidant properties and stability of these colors during application. His research is also focused on application of enzymes as processing aid to affect protein solubilization, allergen degradation and other food industry processes.

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