

Emerging technologies for extraction of bioactives and polysaccharides from tropical fruit waste

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Abstract

The use of emerging technologies to valorize food waste is of growing interest, as the amount of food waste globally is very high. Useful bioactive compounds and functional ingredients can be liberated with the application of sequential separation and extraction processes as outlined in the Universal Recovery Strategy.

Here we detail initial work done on analysing the yield of bioactive compounds and pectin from tropical fruit wastes via a control of thawed frozen waste compared with 2 processes:

1. Freeze drying combined with aqueous, solvent, and acid extraction,
2. Hydrodynamic shockwave technology, combined with aqueous, solvent and acid extraction.

Our waste materials came from tropical fruit processing lines based in Queensland, Australia, and included both mango and pineapple skin and adhered flesh. Compounds of interest from the mango skin and flesh included polyphenols, carotenoids, anthocyanins and pectin, while compounds in pineapple skin and flesh included carotenoids, polyphenols and bromelain. The byproduct of all extractions was primarily cellulose and was of interest for bioplastic development.

We present here our initial conclusions on whether hydrodynamic shockwave technology can enhance accessibility of bioactive compounds and separation of the different components of tropical fruit wastes.

Keywords: Shockwave technology, mango, pineapple, polyphenols, anthocyanins, carotenoids