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ABSTRACT

Spices are ground cryogenically to retain their thermo-sensitive flavoring compounds; thereby, producing a high-quality powder. In the cryogenic grinding process, spices are initially precooled with a cryogen (Liquid nitrogen; LN_2) followed by grinding. To simulate and model, breakage, fluid and heat transport phenomena, an insight of a spice micro-structure is required. Thus, the article aims to investigate the effect of cryogenic treatment on micro-structural characteristics of some Indian spices namely black pepper, cinnamon, king chili, and fenugreek. X-ray micro-computed tomography (X-ray μCT) coupled with image analysis was used to observe quantitative parameters along with two- and three- dimensional images of micro-structure of the spices. Dimensional details, color, moisture level, and volatile oil content of the samples were also elaborated in line. The micro-structural changes of cryogenically treated (LN_2 dipped)

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