

High Pressure Processing of Jackfruit Bulbs: Effect on Color, Nutrient Profile and Enzyme Inactivation

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Abstract : Jackfruit (*ArtocarpusheterophyllusL.*) is an underutilized yet highly nutritious fruit with unique flavour, known for its therapeutic and culinary properties. Fresh jackfruit bulb has a very short shelf life due to high moisture and sugar content leading to microbial and enzymatic browning, hindering its consumer acceptability and marketability. An attempt has been made for the preservation of the ripe jackfruit bulbs, by the application of high pressure (HP) over a range of 200-500 MPa at ambient temperature for dwell times ranging from 5 to 20 min. The physicochemical properties of jackfruit bulbs such as the pH, TSS, and titrable acidity were not affected by the pressurization process. The ripening index of the fruit bulb also decreased following HP treatment. While the ascorbic acid and antioxidant activity of jackfruit bulb were well retained by high pressure processing (HPP), the total phenols and carotenoids showed a slight increase. The HPP significantly affected the colour and textural properties of jackfruit bulb. High pressure processing was highly effective in reducing the browning index of jackfruit bulbs in comparison to untreated bulbs. The firmness of the bulbs improved upon the pressure treatment with longer dwelling time. The polyphenol oxidase has been identified as the most prominent oxidative enzyme in the jackfruit bulb. The enzymatic activity of polyphenol oxidase and peroxidase were significantly reduced by up to 40% following treatment at 400 MPa/15 min. HPP of jackfruit bulbs at ambient temperatures is shown to be highly beneficial in improving the shelf stability, retaining its nutrient profile, color, and appearance while ensuring the maximum inactivation of the spoilage enzymes.

Keywords : antioxidant capacity, ascorbic acid, carotenoids, color, HPP-high pressure processing, jackfruit bulbs, polyphenol oxidase, peroxidase, total phenolic content

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