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ENZYMES IN OIL PROCESSING

Recent Developments and Applications

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Contents

CHAPTER 11

Ultrasound-assisted enzymatic extraction of oil

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11.1 Introduction

In recent years, ultrasound-assisted enzymatic extraction (UAEE) has gained immense popularity, and the synergistic effect of ultrasound and enzymes in oil recovery from oilseeds and other oil-bearing substances is widely explored. The process of oil extraction from oil-bearing substances majorly involves the dissemination of the crushed oilseeds in water and applying propulsive force to obtain oil from the cellular periphery. Furthermore, pH, temperature, time length, solid-to-liquid ratio, and fragment proportion of crushed seeds all influence the rate of oil extraction. To improve oil extraction efficiency, these parameters must be tuned. The major cell wall—constituting elements are cellulose, pectin, and hemicellulose. The cell wall allows categorization among the cells, which helps in cell protection and shape maintenance. Nonetheless, the cell of cotyledon contains a substantial quantity of oils and proteins as power reserves, which are girded in the cell wall and hence may impede oil release. The hydrolysis of oil-bearing substances in cell walls is carried out by enzymes, namely, cellulases, pectinases, and hemicellulases which can work synergistically. These enzymes affected the yield of extraction along with the dissipation of nonlipid substances, but deterioration in the cellulose was rarely observed [1].

The industrial application of enzymatic technology has been confined to academics because of enzyme preparation costs and subsequent economic drawbacks for many years. As far as enzyme-assisted aqueous processing is concerned, it entails high cost; therefore, an inexpensive method to utilize protein-rich liquid phase needs to be explored. The other

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