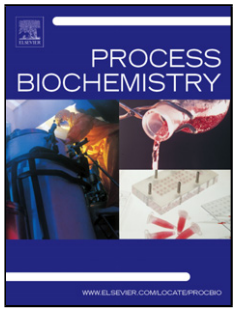

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Ultrasound extraction of polysaccharides from guava leaves and their antioxidant and antiglycation activity

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Highlights

- 1. Ultrasonic conditions significantly affect extraction efficiency.
- 2.Guava leaf polysaccharides (GLP) has good antioxidant activity.
- 3. GLP exhibits remarkable hypoglycemic activity in vitro.

Abstract: Plant polysaccharides possess multiple physiological activities. Box-Behnken design (BBD) was employed to optimize the ultrasound-assisted extraction of polysaccharides from guava leaves (GLP). It was found that ultrasonic time, temperature and power has a significant effect on the extraction efficiency. The yield of GLP was 1.00 ± 0.04 % under the optimal condition of extraction time of 20 min, temperature of 62 ℃ and ultrasound power of 404 W. The DPPH and $ABTS^+$ radical scavenging rate of GLP was 56.38 % and 51.73 % at 100 μg/mL, respectively. The rate of inhibition of α-amylase by GLP was only 14.06 % at 1 mg/mL; however, its α-glucosidase inhibition rate reached 99.54 % at 100 μg/mL. These results suggested that the ultrasound-assisted extraction for GLP is effective and environmentally friendly and GLP has wide application potentials as natural antioxidants and α-glucosidase inhibitors.

Keywords: Polysaccharides; Guava leaves; Ultrasonic-assisted extraction; Antioxidant; Antiglycation

1. Introduction

Diabetes mellitus (DM) is a serious health problem in the world. DM is the most common chronic disease characterized by high blood glucose level, beta cell dysfunction and complications [1]. Long-term exposure to high blood level leads to excessive production of reactive oxygen species. Oxidative stress is one of the main mechanisms of progression of diabetes and results in cellular damage that precedes the onset of diabetic complications [2]. Medical and nutritional researches have always stressed the health benefits of eating fruits, vegetables and plant-based foods to reduce the risk or of disease such as obesity, cardiovascular, Type 2 diabetes and cancer [3].