Optimization of antioxidant extraction on banana peels using response surface methodology

ABSTRACT

Banana peels are known as waste in the industry. Unutilized banana peels for other valuable purposes is also a disadvantage because banana peels contain a significant content of antioxidants. The purpose of the study is to produce antioxidants extract from banana peel waste. It also investigates the optimized condition for the extraction of antioxidants in banana peels under different parameters, which were ethanol concentration (20% to 80%), extraction period (5 min to 35 min) and extraction temperature (30°C to 50°C). The antioxidant activity of banana peel extract was assessed using DPPH radical scavenging assay. Results show that the highest antioxidant activity observed was 88.68%, and the lowest was 35.25% by experiment. The optimized conditions evaluated by Response Surface Methodology (RSM) are an ethanol concentration of 39.78%, an extraction period of 10.75 minutes and an extraction temperature of 43.99%. Under these optimized conditions, the antioxidant activity content was 89.82%, a 1.14% higher than the estimated value (88.68%). The parameters' effect study shows a relationship where a lower concentration of ethanol, a longer extraction period, and a high extraction temperature increase antioxidant activity. The IC50 concentration of banana peel extract is 0.0646 mg/mL. In conclusion, banana peel extracts had shown to have a good potential of antioxidant content.