ULTRASOUND-ASSISTED EXTRACTION OF AMYGDALIN FROM WASTE PLUM KERNELS

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ABSTRACT

Amygdalin, a cyanogenic glycoside predominantly found in the seeds of stone fruits such as plums, apricots, and peaches, has long been recognized for its potential antitumor properties. The biological activity of amygdalin is attributed to the selective release of hydrocyanic acid, which exhibits cytotoxicity toward cancer cells. Given that extraction efficiency is highly dependent on process parameters, developing optimized methods for amygdalin recovery remains a significant challenge. This study investigates the efficacy of lactic acid as a solvent, combined with ultrasound-assisted extraction (UAE), for recovering amygdalin from waste plum kernels. The performance of UAE (180 W, 40 kHz) was compared against conventional extraction (magnetic stirring, 500 rpm). Both methods were conducted at a kernel-to-solvent ratio of 1:15 w/v, a temperature of 30 °C, and a duration of 30 min. Furthermore, the efficiency of lactic acid was benchmarked against ethanol. Results showed that amygdalin yields using lactic acid reached 40.6% via UAE and 32.8% via conventional extraction. In stark contrast, ethanol yields were significantly lower, reaching only 0.8% and 0.07% for UAE and conventional extraction, respectively. These findings demonstrate that lactic acid is a highly effective and promising green solvent for amygdalin extraction, particularly when integrated with process intensification techniques such as ultrasound.

Keywords: amygdalin, lactic acid, plum kernels, ultrasonic extraction.

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