

Comparison of Alliin Recovery from *Allium sativum* L. Using Soxhlet Extraction and Subcritical Water Extraction

ABSTRACT

Garlic (*Allium sativum* L.) is an herbaceous plant and is recognised for its numerous medicinal and culinary properties, and it is used in diverse food preparations for its characteristic flavour and aroma. High alliin content increases the formation of allicin, a bioactive compound of garlic. Therefore, this research aimed to compare different extraction methods for garlic (*Allium sativum* L.) between subcritical water extraction (SWE) and Soxhlet extraction to obtain a high extraction yield and alliin content. The SWE conditions were 120 °C and 180 °C temperatures and 2 mL/min and 6 mL/min flow rates at a constant pressure of 15 MPa for a 10 min extraction time, respectively. In the meanwhile, the extraction time for Soxhlet extraction with various solvents, namely, distilled water, ethanol–water (1:1), and 100% ethanol, was two hours. High-performance liquid chromatography (HPLC) was used to analyse alliin. Soxhlet extraction had the best yield (1.96 g) using ethanol–water (1:1) as the solvent in comparison to SWE extraction (1.28 g) at 180 °C and 6 mL/min. In contrast, SWE yielded a greater concentration of alliin (136.82 mg/g) at 120 °C and 2 mL/min than the Soxhlet method when using distilled water as the solvent (65.18 mg/g). Therefore, SWE may replace Soxhlet extraction as the conventional method for extracting alliin from garlic at a high concentration, and SWE has advantages that favour garlic extracts.