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Optimization of calcium extraction from Stichopus horrens using sulphuric acid
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Abstract
Sea cucumbers, in Malaysia also known as gamat, have been used for food and folk medicine in Asia and the Middle East communities. Sea cucumbers have impressive amount of valuable nutrients. One of the most popular uses of the sea cucumber is for wound healing especially Stichopus horrens. Previous studies showed that S. horrens have a great content of nutrients and minerals. There have been several research showings that nutrients and minerals, such as collagen and calcium, from this species can greatly contribute to wound healing effect. In this study, calcium extraction was conducted and optimized to obtain the optimum amount of calcium from S. horrens. The extraction method that was used is sulphuric acid extraction in a water bath shaker and the drying method was used is oven drying. Five gram of ground S. horrens dried sample were tested under three different sets of variables which are concentration of solvent, temperature and duration of the extraction. In this study, the data obtained from the extractions were analyzed using Two-Level Factorial design from Design Expert software. From the analysis, concentration of solvent was found to be not significant while temperature and duration of extraction were significant. It is shown that the higher the temperature and the duration of extraction resulted higher amount of calcium extracted. In this study, the concentration of solvent used are 2, 3 and 4 M, the temperature that were used are 40, 60, and 80 °C and the duration of the extraction used are 80, 110, and 140 minutes. By using the Design Expert software, the optimum conditions for the calcium content yield would be using 2 M of solvent concentration, 80 °C for temperature and 140 minutes duration for extraction. © 2024 Author(s).

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