UNIVERSITI TEKNOLOGI MARA

MICROWAVE ASSISTED EXTRACTION OF PINEAPPLE PEEL AND CORE

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ABSTRACT

Ananas Comosus is an important tropical fruit grown extensively and consume by people around the world as dried product, jam, juice, fresh fruit and jelly. However, some part of fruit like peel, core and crown were considered as waste and no value that being disposed to landfill or for composting. The aims of this study are to determine the total phenolic compound in pineapple peel and core and determine the effect of microwave power on extraction process. The peel and core of pineapple were washed in sodium hypochlorite, removed and finely cut and then dried in oven for 50°C. After that, the sample was stored in dark bag. For extraction process, 1.5 g powder was soaked in solvent, adjusted the pH and extracted with different microwave power of 180W, 300W and 450W and lastly cooled, filter, also centrifuged for 15min. The analysis can be carried out next using UV-Spectrophotometer and the results obtained were compared with gallic acid standard curve. The microwave power for 180W, 300W and 450W and extraction time 2min and 3min were manipulated. The highest extraction point obtained for peel was 3min at 180W. Meanwhile, the core had the highest extraction of total phenolic compound was 2min at 300W and the optimum condition expressed for all parameter at 300W. From the result obtained, it have demonstrated that phenolic compound is able to extract using the methods of microwave assisted extraction. In the future, to improve the accuracy of the results obtained throughout the experiment, the experiment need to be apply at medium microwave power with shorter extraction time. This can help in reduce the cost and save the energy. Besides that, rather than use ethanol as solvent, the combination of solvent like ethanol-water might be more efficient and recommended to use new extraction techniques other than MAE for natural substance

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INTRODUCTION

1.1 RESEARCH BACKGROUND

Ananas comosus is the scientific name for pineapple that normally grown in several tropical and subtropical countries include Philippines, Thailand, Indonesia, Malaysia and China (Pavan *et al.,* 2012). In Malaysia, pineapple fruit is one of the popular fruits being planted. After banana and mango, pineapple fruit is the third most essential tropical fruit in the world (Moyle *et al*. 2004). Pineapple plant has several benefits that utilize in medical treatment also the food industry. In medical treatment, the fruit are good digestion system, cancer prevention, digestion system also the tissue and cellular health with increase immune system. Meanwhile, for food industry, it is usually use to produce fruit drinks and juice where the only part that use is the pulp as it has large amount of juice. Therefore, another part likes the crown, core, peel, leaves will go as the solid waste.

Thus, this solid waste part can cause problem and impact the environment when being disposed to environment. In order to reduce the solid waste, value addition for these solid waste done by extracting the phenolic compound. The phenolic compound in pineapple is rich in health promoting compound and does good to public health due to its antioxidants activity that have inhibitory effect on mutagenesis and carcinogenesis.

Nowadays, Microwave assisted extraction (MAE) is one of the best choice compared to traditional extraction methods, and it holds so much benefit such as shorter processing time, little amount of solvent, greater yield of extraction, more dependable quality products with lower production cost. Mostly, the conventional extraction process is time consuming and need for the newer method like this MAE that could be a possible way of minimizing the stated adverse effects. The purpose of this research project is to develop a microwave assisted extraction of phenolic compound in pineapple peel and core and to obtain optimal conditions.