



**The 3rd International Conference On Natural Sciences,
Mathematics, Applications, Research, and Technology
(ICON-SMART 2022)**

FACULTY OF MATHEMATICS AND NATURAL SCIENCES
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May 24, 2022

Dear

Feti Fatimah

*Department of Chemistry,
Faculty of Mathematics and Natural Sciences,
Sam Ratulangi University, Manado,
Indonesia.*

Thank you for your interest in **The 3rd International Conference on Natural Sciences, Mathematics, Applications, Research, and Technology (ICON-SMART 2022)** and submitting your Abstract entitled:

“Extraction and Identification of Sago caterpillar Oils”

It is our pleasure to inform you that your paper based on your Extended Abstract, **has been accepted** for presentation at the conference, which will be taking place hybrid at Discovery Kartika Plaza Hotel, Kuta, Bali, on 3 – 4 June 2022.

We hereby have the honor and pleasure of inviting you to present your paper at the conference.

Should you have any questions or concerns, please do not hesitate to contact us at icon-smart@unsrat.ac.id.

We are looking forward to hearing your presentation at this conference.

Warm regards,

Susan Marlein Mambu, S.P., M.Si., Ph.D.
Chairperson



CERTIFICATE

is proudly presented to

Prof. Dr. Feti Fatimah, M.Si.

In recognition of an outstanding contribution as

Presenter

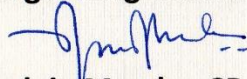
at The 3rd International Conference on Natural Sciences, Mathematics,
Applications, Research, and Technology (ICON-SMART 2022)
Hybrid: Discovery Kartika Plaza Hotel & Zoom,
Kuta-Bali, 3 – 4 June 2022

Faculty of Mathematics and Natural Sciences
Sam Ratulangi University


Prof. Dr. Benny Pinontoan, M.Sc.

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Extraction and identification of lipid profile of oils from sago caterpillars

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Abstract. In North Sulawesi, sago caterpillars have not been used commercially. Although some have used sago caterpillars as food, in most developing countries people do not like to eat insects. This study aims to extract and determine the characteristics of sago caterpillar oil and its potential as cooking oil. Sago oil extraction was carried out using 3 methods namely Pressing, Soxhlet Extraction, and Lipid Folch Extraction. In the pressing method, the sago caterpillars are roasted and then baked in the oven, then extracted using a hydraulic press. In the Soxhlet extraction method, oil is extracted using petroleum ether. In Folch's Lipid Extraction, sago caterpillars were ground and mixed with chloromethane/methanol (2:1). Furthermore, the obtained sago caterpillar oil was identified by GC-MS and Fourier Transform Infra-Red (FTIR). The results showed that the yield of sago caterpillar oil obtained by the third method was different. The yield of sago caterpillar oil obtained by the pressing method, Soxhlet method, and Folch's Lipid Extraction were 20, 16, and 2.2%, respectively. The results of the analysis of sago caterpillar oil with GC-MS showed that the sago caterpillar oil contained 1.25% myristic acid, 4.42% palmitoleic acid, 44.05% palmitic acid, 1.20% linoleic acid, 46.79% oleic acid; and 0.05% stearic acid. The main peak positions from FTIR spectroscopy are located at 724, 1118, 1165, 1234, 1458, 1658, 1743, 2854, 2924, and 3471 cm^{-1} . The results of the GC-MS analysis of sago caterpillar oil also showed that the lipid profile of sago caterpillar oil was similar to that of commercial palm oil. Based on the results of extraction and identification, it was concluded that sago caterpillar oil has the potential to be used as cooking oil.

INTRODUCTION

The extent area of sago in Indonesia is a potential factor for its utilization. About 60% of the world's sago area is in Indonesia. One of the areas where sago plants are spread in Indonesia is North Sulawesi. The use of sago plants in North Sulawesi is still very limited, sago plants are only used as raw material for sago flour. Sago processing is still done traditionally, making many farmers reluctant to take advantage of this plant. If it is not utilized, then the cut sago tree trunk will become a medium for the development of sago caterpillars.

At this time, sago caterpillars have not been used commercially. Although some people in Papua and Maluku use sago caterpillars as food, in North Sulawesi consumption of sago caterpillars is rarely found. According to Chen et al. [1], in most developed countries people do not like to eat insects because of their "dirty" and "scary" image, so it is necessary to elaborate on the use of sago caterpillars so that they have commercial value. The protein and fat content of sago caterpillar instar larvae were 27.97% and 59.71% [2]. Based on this, the sago caterpillar is very potential as a source of food oil. This is in line with Tzompa-Sosa, et al. [3] who stated that several types of caterpillar oil and insects have characteristics that are suitable to be used as table oil. This study aims to determine the effectiveness of extraction as well as the fatty acid profile of the lipid available in the sago caterpillar and to compare its fatty acid profile with commercial palm oil.