

CHAPTER 1 - INTRODUCTION

1.1 Background

A 2014 study investigated the mineral and heavy metal composition of Kelakai (*Stenochlaena palustris*) grown in diverse soil types (Rahmawati, D., 2015). Between 2015 and 2019, the antioxidant and antidiabetic properties of this compound were studied (Rahmawati, D., Rifky, N., and Marpaung, A., 2017). Between 2019 and 2025, the studies were advanced to determine the in vitro stability and metabolomic discovery of kelakai. In the ongoing research, the utilization of kelakai as a food ingredient, such as nori sprinkles, is being studied. Indonesia has developed a high demand for nori-based products, leading to a growth in nori and nori-related products, such as seaweed sprinkles, imports. The primary raw material of traditional nori, however, is the species *Porphyra*, which can grow naturally only in subtropical climates. Such a geographical constraint is why nori is mainly produced in nations such as Japan, Korea, and China (Innayatuhibbah, G., *et al.*, 2017). While past research confirms Kelakai's nutritional and functional value, a clear research gap remains. No comprehensive study has been conducted to develop a standardized processing route for transforming raw Kelakai into a stable, value-added food product with proven consumer acceptance. Therefore, this research aims to fill this gap by developing and validating a production process for an Indonesian-style nori sprinkle using Kelakai.

1.2 Research Problems

1. The lack of standardization and unknown variability in Kelakai's bioactive compounds is due to differences in growing conditions.
2. Nutrition degradation occurs during the processing of raw materials.
3. There is no established kelakai formulation as a nori sprinkle that suits Indonesian taste preferences.

1.3 Research Objectives

1. Kelakai selection for the raw material of nori sprinkle based on metabolomics.

2. To find the effect of nori sprinkle production on the nutritional value of raw materials.
3. To enrich nori sprinkles with kelakai and assess the acceptability.

1.4 Significance of Study

1. The research will generate scientific data related to the metabolomic profile of kelakai (*Stenochlaena palustris*) under various growing conditions.
2. Utilizing kelakai aligns with the Sustainable Development Goals by promoting biodiversity and reducing dependence on imported raw materials.
3. This study introduces a novel food product that utilizes local plant resources while incorporating modern food trends.

1.5 Research Questions

Question #1: How do different soil types and environmental conditions affect the metabolomic profile of Kelakai (*Stenochlaena palustris*), and which source provides the most suitable raw material for nori sprinkle production?

Question #2: What is the degree to which processing parameters degrade the bioactive compounds in kelakai during the nori sprinkles production process?

Question #3: Could adding kelakai be preferred as a kelakai nori sprinkle?

1.6 Hypothesis

Hypothesis #1: Kelakai can be utilized as a substitute for nori sprinkles as a raw material.

Hypothesis #2: The nutritional content of kelakai decreases during the production process of kelakai nori sprinkle.

Hypothesis #3: Consumers like the addition of kelakai to nori sprinkles.