Nutritional Characteristics of Berunok (Paracaudina australis) Flour

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Abstract. Berunok has been a commodity with low economic value, so it is necessary to use Berunok which has high nutritional value. This study aims to determine the proximate content of P. australis. Parameters measured were yield value and proximate analysis of berunok flour. This study consisted of two stages, namely sample preparation and manufacture of berunok flour, analysis of the chemical composition of berunok flour. The research design used a completely randomized design (CRD). The results showed that berunok flour had a dry texture, very smooth, and brownish in color. While the chemical composition contained in Berunok flour is water content of 8.19%, ash content of 37.21% (db), protein content of 48.78% (db), fat content of 3.44% (db), and carbohydrate content by a difference of 10.57% (db). The average yield value of 83.34%.

1. Introduction
Berunok is one type of sea cucumber or also known as sea cucumber, teat fish, and sea ginseng which includes soft-bodied marine animals with elongated shapes like cucumbers. Berunok is widely spread in the waters of Karimun Regency. Karimun Regency is one of the islands that has quite abundant fishery potential with the number of fishery exports reaching 1,408,249,797 tons in 2017 (BPS, 2018).

Berunok is a type of marine biota that usually lives in muddy and seagrass coastal areas but has not become a commodity that has high economic value. Berunok is often consumed raw by the Malay community and even used as bait for fishermen to catch fish, so Berunok cannot be sold in the market because not many general public knows about its potential (Ocsandy et al., 2019).

Research Paracaudina australis has not become a high-value commodity. One of the efforts to add value to P. australis is to know the proximate content of P. australis. Proximate is an important basic content to determine the development potential contained in a material. This research was conducted to provide information about the nutritional content of P. australis.

2. Methodology
The main material used in this research is dry berunok (Paracaudina australis) obtained from the waters of Tanjung Balai Karimun, Karimun Regency, Riau Islands. Other ingredients are H2SO4, Cu complex, NaOH 40%, aquades, etc.
2.1. Research Stages
The method of this study was experimental method in two steps, they were 1) sample preparation and manufacture of berunok flour and 2) analysis of the chemical composition of berunok flour. The research design used a completely randomized design (CRD).

2.2. Sample preparation and manufacture of berunok flour
The preparation of berunok skin meat flour was carried out by the preparation method according to the Nurjanah method (2008), with slight modifications. Berunok skin is cleaned using clean water and sun-dried to dry for 72 hours. Then it is placed in the oven at 70°C for 24 hours. Furthermore, the size reduction process is carried out using a dry blender with a particle size of 80-100 mesh.

2.3. Analysis of the chemical composition of berunok flour
The chemical composition (proximate) measurements are carried out including: protein, fat, ash, water, and carbohydrates. Protein analysis used the Kjeldahl method, fat using the Soxhlet method, ash (AOAC 2005), moisture (AOAC 2005), and Crude Fiber (by difference).

2.4. Data Analysis
The collected data from each treatment were statistically analyzed by analysis of variance (ANOVA).

3. Results and Discussion

3.1. Berunok Flour
The berunok flour is obtained can be seen in Figure 1.

![Figure 1. Berunok flour](image)

The resulting *P. australis* skin flesh flour is brown, different from the initial color of fresh *P. australis* skin flesh. According to Winarno (2004), the non-enzymatic browning reaction or the appearance of brownish color in the resulting flour occurs because carbohydrates will react with protein when there is heat. Berunok meat and skin that has become flour has calculated as the value of the flour yield. The yield of berunok flour can be seen in Table 1.

| Repetition | Average dry weight of *P. australis* skin meat (g) | Average weight of *P. australis* skin meat flour (g) | Flour yield (%) |
|------------|--------------------------------|--------------------------------|----------------|
| 1          | 63                             | 52                             | 82.54          |
| 2          | 68                             | 56                             | 82.35          |
| 3          | 74                             | 63                             | 85.13          |
The higher yield is beneficial from an economic point of view. The results showed that the average yield of *P. australis* flour was 83.34%. The remaining 16.66% yield was due to some flour particles left in the container during the blender and sifting process, and some scattered in the air. According to Hiswaty (2002), the higher the rendement value, the more sample values that can be utilized.

3.2. Proximate analysis of berunok flour

The nutritional content of berunok flour is shown in Table 2.

| Content          | Percentage (%) |
|------------------|----------------|
| Water            | 8.19%          |
| Ash (db)         | 37.21%         |
| Protein (db)     | 48.78%         |
| Fat (db)         | 3.44%          |
| Carbohydrate (db)| 10.57%         |

The ash content of *P. australis* flour is an average of 37.21% (bk). The results of the analysis of the ash content of *P. australis* flour were not much different from the ash content of sea cucumbers, which was 32.85% (Elisa, 2018). This is because of the habitat of *P. australis* and sea cucumbers that live in muddy sand in coastal waters. The high and low ash content in a material is closely related to the mineral content of the material.

The protein content of *P. australis* flour is 48.78% (wk). Proteins in the body function as food reserves, building blocks, and regulators, forming new tissues, as a source of energy, enzymes, and forming complex antibodies with other molecules. This protein cycle can occur in cells, tissues, or body and involves the digestive tract (Karnila, 2012).

Fat content in flour *P. australis* with an average of 3.44% (wk). The presence of fat content is due to the raw material source of this flour is the meat and skin of *P. australis*. The body part of the sea cucumber consists of muscles and ossicles which are fat storage places and the presence of blood vessels that are likely to contain fat which will be spread to all parts of the body (Nurjanah, 2008).

4. Conclusions

Based on the results of the research that has been done, the following conclusions are the nutritional content of berunok flour includes water content of 8.19%, ash content of 37.21% (db), protein content of 48.78% (db), fat content of 3.44% (db), and carbohydrate content by a difference of 10.57%. The average yield value of 83.34%.

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