

The Effect of Taro Type On Organoleptic Quality, Likelihood Level, and Nutritional Content Of Taro Cookies

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Abstract. This study aims to determine the effect of different types of taro varieties—purple taro (*Colocasia esculenta*), enthik taro (*Colocasia esculenta* L.), kimpul taro (*Xanthosoma sagittifolium*), and bogor taro (*Colocasia esculenta* L. Schott)—on the organoleptic quality, preference level, and nutritional composition of taro-based cookies. The research used a quantitative experimental design with a one-factor Randomized Block Design consisting of four treatments and three replications. Organoleptic tests were conducted to evaluate color, texture, aroma, taste, and overall acceptance using hedonic scales. In addition, protein content was analyzed using the Kjeldahl method, while moisture content was analyzed using gravimetric methods. Statistical analysis using one-way ANOVA showed significant differences ($p < 0.05$) among taro varieties in aspects of color, taste, aroma, and overall acceptance, while the texture aspect showed no significant difference. Purple taro yielded the highest scores for aroma and taste, while bogor taro produced the best color characteristics. The preference test also revealed favorable acceptance for cookies made with purple taro. Nutritionally, taro cookies met SNI standards for moisture content and protein composition. These findings indicate that taro varieties significantly influence the sensory characteristics and nutritional value of cookies.

Keywords: cookies, taro, protein content, water content

INTRODUCTION

Taro (*Colocasia*) is widely known in Indonesia as a staple carbohydrate source with high potential for food diversification. Traditionally, taro is consumed by boiling or steaming; however, processing into taro flour offers better storage stability and broader application in various product (Hasnelly, Nurminabari, & Meiliawati, 2020; Suismono, Sudaryono, Lubis, & Munarso, 2005).

Cookies are widely consumed bakery product with relatively long shelf life and flexible formulation. According to the Indonesian National Standard (BSN, 2011, 2022), cookies must meet criteria for minimum protein content, moisture level, and sensory acceptability. Substituting taro flour into cookie formulations is relevant for increasing value and supporting local food diversification.

Previous studies reported that taro varieties exhibit different physicochemical properties such as carbohydrate content, protein levels, amylopectin composition, and water solubility index (Sulaiman & Noviasari, 2023). These differences may influence sensory attributes and nutrient composition of final products. However, limited research compares cookies made from different taro varieties in a comprehensive manner including sensory quality, preference testing, and nutrient analysis.

Therefore, this study aims to analyze the influence of four taro varieties: purple taro, kimpul, enthik, and bogor taro, on the organoleptic quality, preference level, and nutritional content (protein and moisture) of taro cookies.

METHOD

This research used a quantitative approach with a one-factor Randomized Block Design, consisting of four treatments and two replications. The variable studied was the type of taro used.

Independent Variable:

Treatments	Type Of Taro
F1	<i>Talas Ungu</i>
F2	<i>Talas Enthik</i>
F3	<i>Talas Kimpul</i>
F4	<i>Talas Bogor</i>

Dependent variables are organoleptic quality (such as color, aroma, taste, texture, and overall), preference level, protein content, and moisture content. Meanwhile control variables divided into recipes, equipment, ingredient quality, and also baking process.

RESULT AND DISCUSSION

ANOVA results indicated a significant effect of taro variety on organoleptic quality. The aspects of each level are:

Organoleptic Quality - Color

Anova Results indicated a significant effect of taro variety on color ($p < 0,05$). Bogor taro cookies showed the highest mean score (6,30), attributed to higher flavonoid and anthocyanin content and *maillard* reaction pigment formation (Figoni, 2010, Damodaran & Parkin, 2017, Sulaiman & Noviasari, 2023,).

Organoleptic Quality – Texture

Texture scores showed no significant differences among taro varieties ($p > 0.05$). This aligns with Deguchi, Ito, Motomashi, & Arai (2021), which stated that textural differences among taro varieties are generally minimal.

Organoleptic Quality - Taste

Taste also differed significantly among treatments ($p < 0.05$), with purple taro cookies receiving the highest preference score (7.20), followed by bogor taro cookies with a post-hoc score of 7.10. The higher preference for the taste of purple taro is often associated with its distinct natural sweetness and lower levels of bitter or astringent compounds after baking, which provides a more pleasant flavor profile in bakery products (Wibowo et al., 2021).

Overall Acceptance

Overall acceptance showed significant differences among varieties. Purple taro cookies were most preferred, followed by bogor taro. The post-hoc results show that purple taro was most preferred with a score of 6.30, followed by bogor taro with a score of 6.10.

Overall Acceptance of Preference

The overall results at the overall level showed that purple taro produced the highest level of liking. The average result of the overall level of liking for purple taro is 7,45. This high level of overall acceptance aligns with recent studies indicating that the unique natural color and pleasant aroma of purple taro significantly enhance consumer sensory appeal and overall palatability in gluten-free or substituted cookies (Sari & Rahmawati, 2022; Sulaiman & Noviasari, 2023).

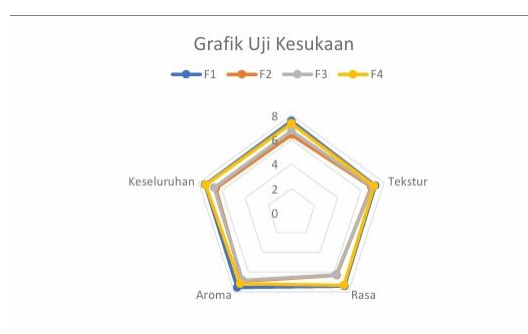


Fig. 1. Preference Level of Overall

Protein Content of Taro Cookies

The results indicate that each taro variety contributes different levels of protein, which is strongly associated with the natural nitrogen composition and varietal characteristics of the tuber. Varieties of *Colocasia esculenta* generally possess higher protein concentrations compared to *Xanthosoma sagittifolium*, resulting in cookies with correspondingly higher protein values (Boahemaa, Dzandu, Ammisah, Akonor, & Saalia, 2024; Paramita, Fathonah, Rosidah, Agustina, & Larasati, 2021)

Moisture Content of Taro Cookies

The findings reveal that all cookie samples exhibit moisture levels below the maximum threshold established by SNI 2973:2011, which requires biscuit moisture not to exceed 5%. This indicates that all formulations meet the standard for storage stability and shelf-life quality. On the other hand, *Xanthosoma sagittifolium* (kimpul) typically contains higher water-retention capacity, which explains the slightly higher moisture readings observed in cookies made from this flour, a pattern that is consistent with the results recorded in previous studies (Sulaiman & Noviasari, 2023).

CONCLUSION

The type of taro variety significantly affects cookies' sensory quality particularly color, aroma, taste, and overall acceptance while texture remains unaffected.

Purple taro yields the best overall sensory acceptance, especially in aroma and taste, whereas *bogor* taro produces superior color. The protein and moisture content of taro cookies meet the SNI requirements, indicating that purple taro flour is a suitable ingredient for cookies formulation.

Further research is recommended to modify formulations for improved texture and extended shelf-life.

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