Analysis of Clay Materials for Improving References and Productivity in Pottery Art Creation

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Abstract. The investigation of clay as a medium for pottery is the subject of this research topic. Clay displays unique characteristics in various places. A mixture of minerals and organic material that are formed from clay soil is what forms clay, which is utilized for making pottery. The geological processes that are involved in the formation of this clay affect its composition, which varies based on its geographical location. This study takes samples in Sukorame Sub-village, Duren Sewu Village, Pandaan District, Pasuruan Regency. This research aims to analyze the properties of clay, including its characteristics, content, and suitability for various categories of pottery work from low to high firing. This research was conducted using an interpretive qualitative method. The results of this research show that soil samples from Pasuruan can be used for decorative, functional, and ornamental objects. For tableware, clay from this area is suitable for making *kendi* and *cobek*.

Keywords: Javanese Speech Level, Media, Materials.

1 Introduction

Potteries have been integral to human culture for centuries, providing artistic value and practical utility. The pottery production process begins with the selection of raw materials, and one of the most critical materials is clay [1]. Clay has unique characteristics related to geographical location and geological processes, affecting the properties of the resulting potteries. Therefore, an in-depth analysis of various types of clay from different places can significantly contribute to the understanding and development of pottery works [2].

This study takes samples from Sukorame Sub-village, Duren Sewu Village, Pandaan District, Pasuruan Regency. Sukorame Sub-village was selected because the clay in this area is believed to have unique qualities and characteristics with great potential for pottery production. Soil samples were taken from several locations in this hamlet to ensure a good representation of the available clay variations [3]. The sampling process involves digging the soil to a certain depth to obtain clay that has not been contaminated by external factors. These samples were then analyzed to identify the mineral composition, organic material content, and their physical and chemical prop-

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erties, as well as to determine the suitability of this clay for various types of pottery works, from low to high firing [4].

2 Methods

This qualitative research used interpretative qualitative as a method. Miles and Huberman [2] explained that this method is a research approach used to understand and explain complex phenomena in their natural context. This method is usually used when the research aims to understand a phenomenon's meaning, interpretation, and context rather than quantitatively measuring variables.

Several steps are taken to get results. The first is sampling in which researchers took soil samples in Sukorame Sub-village, Duren Sewu Village, Pandaan District, Pasuruan Regency. The second is sample documentation (soil samples were documented in detail to record the initial conditions and sampling location). The third is soil processing (soil samples were processed to be made into test pieces) [5]. This process includes cleaning from contaminants and refining texture. The fourth is test piece making (the clay was processed into test pieces using the slab technique, each with an initial size of 6x6 cm). the fifth is dimension measurement (the dimensions of the test pieces were measured from the initial size, shrinkage during drying, and shrinkage after firing). The last is clay character analysis (the characteristics of the clay were analyzed, including plasticity, mechanical strength when dry, and response to firing temperatures).

3 Results and Discussion

3.1 Results

Based on data analysis results, clay from Sukorame Sub-village, Duren Sewu Village, Pandaan District, Pasuruan Regency has characteristics that can be optimized for various pottery applications [6]. In the filtering process, wet clay is sieved using a flour sieve, resulting in a finer and more plastic material. After filtering, the clay is dried until the desired plasticity level is reached. The clay was then formed into test pieces using the slab technique with an initial size of 6x6 cm.

Observations were made for one week to measure shrinkage during the drying process. Measurement results showed that the size of the test pieces after one week of drying became 5.7x5.7 cm, indicating significant dry shrinkage [7]. The firing process was carried out at a temperature of 1180°C, and the results showed that the final size of the test pieces became 4.3x4.3 cm. This shrinkage illustrates the reaction of the clay to high-temperature changes, which is important for understanding the dimensional stability and structural integrity of the clay during the firing process [8].

3.2 Discussion

This study aims to characterize the clay from Sukorame Sub-village, Duren Sewu Village, Pandaan District, Pasuruan Regency, focusing on its potential use in pottery production.

Analysis shows that clay from Sukorame has very good plasticity, facilitating manual forming with the pinch technique [9]. When dry, this clay shows adequate strength, with minimal cracks or breaks, indicating good stability and homogeneity. It allows the clay to maintain shape and integrity during drying. In the firing process, the clay shows adequate strength, with the body clay remaining strong even at high temperatures. The clay's resistance in the firing process indicates that this clay has good potential for use in various types of potteries that require firing temperatures ranging from low to high [10].

This clay is suitable for making pottery with firing temperatures between 800°C to 1150°C. Clay can be used to make both small and large pottery. However, for pottery with dimensions over 35 cm, the addition of sand is required to increase strength and reduce the risk of deformation or cracking during drying and firing [11]. This clay also has good flexibility but low porosity, making it very suitable for decorative, functional, and ornamental objects. In the context of tableware, this clay is ideal for making *kendi*, *kuali*, and *cobek*. The diversity of applications shows the potential of clay from Sukorame in supporting various pottery products with broad functionality [12].

To sum up, there are four significant points in this part. The first is the composition and characteristics of clay (clay from Sukorame has very good plasticity, allowing for easy manual forming) [13]. During the drying process, the clay shows significant shrinkage but maintains its structural stability without significant cracks or breaks. It indicates adequate dimensional stability and homogeneity. The second is the reaction to firing (this clay shows good performance at firing temperatures up to 1180°C, with controlled size changes and the body clay remaining strong). This property makes the clay suitable for pottery production with a range of firing temperatures from low to high, providing flexibility in various pottery applications. The third is applications and uses (the potential uses of this clay include the production of small and large pottery). For pottery with dimensions over 35 cm, adding sand is recommended to increase structural strength. This clay has low porosity, making it ideal for making decorative, functional, and ornamental objects. In the context of tableware, this clay is suitable for making jugs, jars, and mortars. The last is usage recommendations (based on the identified physical and chemical properties, clay from Sukorame can be relied upon as a raw material for decorative and functional potteries) [14]. However, for applications requiring specific durability, such as large pottery, it is recommended to adjust the composition by adding sand or other materials to ensure the quality and durability of the final product. Overall, clay from Sukorame Sub-village shows great potential as a pottery raw material, with qualities that allow for a variety of uses from low to high firing [15].

4 Conclusion

This study analyzes the characteristics of clay from Sukorame Sub-village, Duren Sewu Village, Pandaan District, Pasuruan Regency, intending to assess its suitability as a raw material for various types of pottery works. Based on the results of the analysis, four components need to be highlighted: composition and characteristics of clay, reaction to firing, applications and uses, as well as usage recommendations. Further research is recommended to explore the optimization of clay composition for specific applications, as well as testing on finished products to ensure long-term performance and durability.

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