

## ETHNOSCIENCE STUDY OF THE PROCESS OF MAKING ADEM POWDER AS A SCIENCE LEARNING RESOURCE IN JUNIOR HIGH SCHOOL

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### ABSTRACT

Natural Sciences (Science) has a significant role in improving students' ability to understand various natural events around them, including in the context of junior high school science material. This study aims to explore the process of making traditional cooling powder as a source of science learning (IPA) based on ethnoscience for junior high school students. The research was conducted in Kandangmas Village, Kudus, using a qualitative descriptive method. The main source was a traditional midwife with expertise in creating cooling powder from key ingredients such as rice, turmeric, and aromatic ginger (kencur). The stages include soaking, grinding, mixing, shaping, and drying. This study links the process to science concepts, such as changes in the state of matter, frictional force, pressure, density, and heat transfer. The results indicate that integrating local wisdom with scientific concepts can enhance students' understanding of science through cultural context. This approach also strengthens the preservation of local cultural heritage while fostering students' love for their culture and national identity. Utilizing ethnoscience in education provides meaningful, relevant, and contextual learning experiences. Therefore, a culturally-based science learning approach can offer innovative solutions to improve student engagement and preserve local knowledge amidst globalization challenges.

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### Introduction

Natural Sciences (IPA) has a significant role in improving students' ability to understand various natural events around them, including in the context of physical and chemical changes. However, students often face challenges in internalizing abstract science concepts. Natural Sciences (IPA) learning provides students with the opportunity to understand themselves and their surroundings, while developing skills that can be applied in everyday life. This learning process emphasizes providing direct experience that aims to improve students' understanding of nature. This experience is obtained through investigations or experiments carried out by prioritizing a scientific attitude. Active involvement of students in this learning will make it easier for them to understand the material being taught. On the other hand, the diversity of tribes, ethnicities, and cultures owned by Indonesia is a very valuable asset and should be proud of in the international world. This wealth has given birth to various local wisdoms that continue to develop to this day, which include knowledge,

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insight, and customary and traditional values that guide human behavior in everyday life (Keraf, 2006).

In the context of increasingly developing globalization, there is a phenomenon where students are more exposed to foreign cultures and tend to understand and appreciate the local culture and wisdom possessed by Indonesian society less. This results in a decline in the spirit of nationalism among students. To ensure the sustainability of culture and local wisdom, it is important for students as the next generation of the nation to be equipped with a deep understanding of local cultural values through the integration of cultural knowledge in the educational process. Regional culture, local wisdom, and the surrounding environment have a significant contribution to the development of students' learning experiences, both in the cognitive, affective, and psychomotor domains. These three domains are very relevant in the framework of educational innovation that combines cultural aspects with science, known as ethnoscience (Mayasari, 2017). Culture-based learning is very important for students, because through this approach, students are taught to develop a love for culture and national identity. Learning that integrates cultural elements into the learning experience is called ethnoscience. This ethnoscience approach allows students to understand local potentials, so that they can better appreciate their regional culture and help maintain and preserve this heritage sustainably. One method to integrate culture in science learning is to reconstruct traditional knowledge (indigenous people's science) into scientific knowledge. For example, making green sticky rice tapai from Indragiri Hilir, Riau, can be used as a teaching material in learning Natural Sciences (IPA) (Rikizaputra et al., 2022).

One example of traditional ethnoscience that is interesting to discuss is the process of making cool powder, cool powder is included in traditional medicine that has existed since our ancestors and uses several types of plants as ingredients for treating diseases. Traditional medicine refers to ingredients, potions, or mixtures made from plants, animals, or minerals, which have been used for generations for medicinal purposes and in accordance with prevailing norms in society (Tamara et al., 2017). According to (Jumarani, 2009) cold powder is usually made using rice flour, yam starch, and flower extracts such as roses, cananga, cempaka, jasmine, and pandan leaves. The combination of these ingredients functions to care for the skin while providing fragrance. Rice flour is useful for maintaining skin moisture, stimulating collagen formation, increasing skin elasticity, making the skin look brighter and younger. Rice is often used as a cosmetic ingredient because it contains gamma oryzanol, which is spread throughout all parts of rice, including bran and other rice by-products. Gamma oryzanol is found most abundantly in rice bran, followed by brown rice, milled rice, and husks (Butsat et al., 2010).

Several previous studies have examined ethnoscience, namely research conducted by (Putri et al., 2022) stated that this study examines the use of traditional knowledge of Sumenep palace potions as a source of science learning through an ethnoscience approach, which connects local knowledge with scientific science in learning in junior high schools. Other research conducted by (Silla et al., 2023) stated that the relationship between the tradition of making traditional food in East Nusa Tenggara with physics concepts, which can be used as a medium for learning science in schools. Meanwhile, the purpose of this article research is to explore and examine the process of making parem as an example of a local tradition that can be used as a learning resource in teaching physical and chemical changes to students.

## **Method**

This research is a field research where this research focuses more on data that has been collected from sources. In the implementation process, researchers conducted observations,

documentation and interviews (Darmalaksana, 2020). The object of this research is the processing of cold powder, while the subject is Mrs. Sutini who lives in Kandangmas Village, Dawe District, Kudus Regency, Central Java.



**Figure 1. Photo With Resource Persons**

This study uses a qualitative descriptive method. Qualitative research for a descriptive study is also called qualitative descriptive (Kim, 2016). Qualitative descriptive research is a method that describes a situation or phenomenon that occurs using sentences that are then concluded. A qualitative descriptive approach is used to explore local knowledge about making cold powder from informants. This method aims to document traditional recipes and techniques that have been passed down from generation to generation. The study used an interview method to find out the history of the cold powder tradition in Kandangmas Village, explore how to choose the best ingredients (rice, kencur, turmeric), and understand the benefits of cold powder for pregnant and postpartum women.

The types of plants that will be used are rice (*Oryza sativa*), kencur (*Kaempferia galanga*), and turmeric (*Curcuma longa*). There are several stages such as collecting materials, preparing good materials to be made into cold powder. Kandangmas Village has a strong tradition of local wisdom, one of which is related to traditional post-natal treatment carried out by midwives such as Mrs. Sutini. Mrs. Sutini, a midwife who has long been trusted by the community, is the main resource person. She is known to have experience in making traditional cold powder that is beneficial for mothers giving birth. In addition to interviewing Mrs. Sutini, researchers can also conduct interviews with several users of cold powder, especially mothers who have given birth and used the product. This can provide direct insight into the benefits felt, experience of use, and community expectations of traditional cold powder.

To conduct data analysis, 3 stages are carried out, namely 1) Data reduction, this step is carried out by focusing on the important things from the data that has been obtained. This process takes place from observation and interviews until the data is collected (Yuliani, 2018). 2) Data display, namely in qualitative descriptive research, data presentation is done in the form of sentences and made into tables so that it is easier to understand (Rejeki et al., 2020). 3) Drawing conclusions or verification, this conclusion is a new finding in the form of a description or picture of an object that was previously unclear to become clear.

## **Research Result**

Cold powder is one of the traditional cosmetic products that has been used for generations in Indonesia. This product has benefits to protect the skin from sun exposure, prevent prickly heat, reduce the appearance of wrinkles, and shrink enlarged skin pores (Dianzhi et al., 2019). The tropical climate is one of the reasons why Indonesian women use cold powder, especially to prevent prickly heat. (Beers & Jane, 2001) explains that the tropical climate can support skin care through the natural process of sweating, which opens the skin pores, making it easier for dirt to enter and exit. Cold powder is used to help prevent wrinkles and shrink enlarged pores.

Cold powder is a mixture of starch flour with fragrances, which are sometimes supplemented with moisturizers, ultraviolet light blockers, and antiseptics. This powder is in the form of small dry granules with colors and aromas that depend on its composition. The main ingredient in making cold powder is rice flour. The manufacturing process includes mixing the ingredients, forming granules (rolling), and drying. According to Sari, the manufacturing process begins by grinding the ingredients to a certain level of fineness before mixing (Banjar, 2019). Research (Yuliati & Binarjo, 2010) states that the size of cold powder particles greatly affects the quality of the resulting product. After all the ingredients are evenly mixed, distilled water is added gradually to form a paste. This dough is then formed into small balls and dried by drying in the sun (Banjar, 2019).

The history of this cold powder has existed since ancient times and has now been preserved by the next generation with different manufacturing processes or ingredients that are included in the manufacturing process have been combined with modern medical science. Because now modern science is widely known by the public, so certainly in various regions the ingredients and manufacturing processes can also be different. Rice flour is the main ingredient in making cold powder. This flour is known to be effective in moisturizing the skin and increasing collagen production, which plays a role in maintaining skin elasticity. According to (Kartodimedjo, 2013), rice flour has benefits for tightening, brightening the skin, and shrinking pores. The main content of rice flour, such as gamma oryzanol (ferulic acid), functions as an antioxidant that protects the skin from free radicals. In addition, the vitamin content in rice flour can help smooth and nourish the skin, making it look younger (Madjid, 2011).

In addition to rice flour, kencur rhizome is also often used in making cold powder. Kencur rhizome is useful for eliminating body odor and treating irritated skin. In addition, kencur rhizome flour contains the compound ethyl p-methoxycinnamate (EPMS), which is an active ingredient to protect the skin from sun exposure (Barus, 2009). Other researchers in their research said that kencur rhizome can be used as a cold powder for mothers who have given birth and the application of cold medicine to the stomach is carried out for 40 days which aims to tighten the skin (Utami & Kurniawan, 2023).

Turmeric is a medicinal plant in the form of an annual shrub (perennial) that thrives in tropical areas. This plant is usually found growing wild around forests or former garden land. Turmeric is thought to originate from the Binar region at an altitude of 1,300-1,600 meters above sea level (masl), although some also state that turmeric originates from India. The name Curcuma is taken from the Arabic word kuekum and the Greek word karkom. In 77-78 BC, Dioscorides described the plant as Cyperus which resembles ginger, but with a bitter, astringent, slightly spicy taste, and is not poisonous. Turmeric is widely cultivated in South Asia, especially in India, South China, Taiwan, Indonesia (especially in Java), and the Philippines.

According to (Kaban & Sinaga, 2021) Turmeric, which has a shape like a yellow stem tuber and a fresh aroma, is known to have various benefits. Some of them are, increasing blood by squeezing turmeric using cold boiled water, then the squeezed results are filtered and mixed with palm sugar and a little salt before drinking. In addition to increasing blood, turmeric can also be used to smooth the skin and turmeric can also be used as an ingredient to make a powder mixture, which can be applied to the face like a sleep or used as a scrub to smooth the skin of the body.

Based on the author's analysis, the process of making cold powder can be linked to science, namely linked to junior high school science learning materials.

**Table 1. Process of Making Cold Powder with Basic Science Competencies in Middle School**

No	Stages	Genuine science	Scientific Science	Explanation
1.		Rice dampening	Solution and density	Soaking rice involves the concept of science because with the density of rice, rice sinks in water.
2.		Peeling turmeric and galangal	Friction Style	Peeling turmeric and kencur involves friction between the turmeric and kencur skin with a knife..
3.		Pounding rice, turmeric and galangal	Friction Style	Pounding rice, turmeric and kencur involves friction between the ingredients and the pounding tool.
4.		Mix rice, turmeric and galangal	mixture	The mixture of rice, kencur, and turmeric involves the concept of mixture in science material.
5.		Add water to dissolve the rice, turmeric and galangal	Change of state of matter	This process involves combining a solid substance (such as rice) with water, where the solid undergoes dissolution.

				
6.		Form small balls from the dough and flatten them.	pressure	The formation of small spheres and flattening involve the element of pressure in the natural science material
7.		Drying	Heat Transfer	The drying process involves heat transfer, which is a result of radiation from sunlight, so that the material can dry.

**Table 2. Relationship between the Cold Powder Making Process and Basic Science Competencies in Middle Schools**

No	Material	Basic Competencies	Science Material Competence in the cold powder processing process
1.	Substances and their Characteristics	3.3 Explaining the concept of mixtures and single substances (elements and compounds), physical and chemical properties in everyday life	Changes in the state of matter occur when adding water to rice, turmeric and kencur. The solid rice substance begins to dissolve to form a solution with a liquid concentration. In addition, mixing rice, turmeric and kencur produces a heterogeneous mixture where each ingredient maintains its physical properties.
2.	Density	3.2 Describe the concept of density in everyday life	When soaking rice, water seeps into the pores of the rice to form a solution. The density of the material changes because the water is absorbed, making the rice heavier.
3.	Style	3.3 Identifying types of forces, summation of forces and their effects on an object subjected to force.	The force used is friction, namely the process of peeling turmeric and kencur, there is friction between the surface of the peeling tool and the skin of the material. The rougher the surface of the tool or the greater the pressure applied, the easier it is for the turmeric and kencur skin to peel off. In addition, in the pounding process, there is a collision and friction between the surface of the pounding tool and

			the material in the mortar. The greater the mass of the pounding tool and the faster the pounding movement, the greater the collision force produced so that the material becomes smoother.
4.	Pressure	5.5 Investigating pressure on solids, liquids and gases and its application in everyday life	Pressure is the force applied to an object per unit surface area. When the dough is formed into small balls and flattened, the pressure applied by the hands changes the shape and size of the dough so that it is ready for the drying stage.
5.	Heat Transfer	4.4 Conducting experiments to investigate the effect of heat on the temperature and state of objects and heat transfer.	Heat transfer is the transfer of thermal energy from one object to another. In the drying stage, heat from sunlight or other heat sources causes the evaporation of water from the dough. This process involves the transfer of heat by convection (through the air) and radiation (from the sun) to change the dough into a dry solid.

The results of the study indicate that indigenous knowledge of the community can be developed into scientific knowledge in the ethnoscience study of making cold powder from Kandang Mas Kudus and implemented in science learning in junior high schools. One effective way to integrate local potential into science learning in the independent curriculum is to utilize local resources, such as relevant plant types and ecosystems, in learning to increase student participation and understanding (Fitriyani et al., 2021). In order for scientific science to be used as a source of learning, especially in science subjects that include Basic Competencies (KD) analyzing material substances and their characteristics, density, pressure force, and heat transfer, classroom learning will be more meaningful if students are able to transform the knowledge obtained from the surrounding environment into scientific science concepts (Mellyzar et al., 2024). By understanding the relationship between basic science competencies and the stages in the process of making cold powder, teachers and students can see the relevance and practical application of science concepts in everyday life (Sundari et al., 2020). Understanding the relationship between making cold powder and basic science competencies can also strengthen local culture-based science teaching. This approach is in line with the view that science education should be integrated with the social and cultural context in which students are located (Aikenhead, 2001).

## **Discussion**

The results of this study indicate that the process of making traditional cold powder has a close relationship with Natural Science (IPA) learning, especially in the application of concepts such as changes in the state of matter, density, force, pressure, and heat transfer. The ethnoscience approach that integrates local wisdom into science learning provides students with the opportunity to understand science in a context that is relevant to their daily lives. This is in accordance with the meaningful learning approach that emphasizes the importance of learning experiences that are close to the student's environment.

As an illustration, the rice soaking stage illustrates the application of the concept of density and solution, where water seeps into the pores of the rice. The mixing and pounding stages of ingredients such as rice, turmeric, and galangal involve friction, which is part of the concept of force in science. In addition, the formation of cold powder dough into small grains can be associated with the concept of pressure, while the drying process through exposure to sunlight illustrates heat transfer involving convection and radiation.

The ethnoscience-based learning approach not only provides students with a more meaningful and relevant learning experience, but also helps strengthen their cultural identity, because by learning local traditions, such as making cold powder, students can better understand and appreciate their local cultural heritage, while contributing to its preservation efforts. This is especially important in the era of globalization, where foreign cultures are often more prominent than local cultures.

However, the application of ethnoscience in learning has challenges, such as limited resources and literature related to certain traditions that can be used as teaching materials. In addition, teachers also need special training to be able to connect traditional knowledge with scientific concepts effectively.

The ethnoscience approach can be an innovative solution to improve students' understanding of science concepts while strengthening students' cultural awareness. The development of more ethnoscience-based learning materials from various regions in Indonesia is needed to enrich the curriculum and support more diverse local culture-based learning. The results of the study show that learning with ethnoscience provides an understanding of concepts, religious values (Fawaida & Abidin, 2023) and the ethno-STEM approach can improve critical thinking skills (Laily & Fawaida, 2024), the ethnoscience approach is a process of cultural transfer from the previous generation to the next generation for the process of cultural preservation (Ueangchokchai, 2022). So it is important to use ethnoscience as an approach in learning for cultural conservation and preservation of the nation's culture.

## **Conclusion**

Traditional knowledge of the community, in the process of making cold powder, can be developed into a science learning resource based on ethnoscience. This approach improves students' understanding of science concepts, such as substances and their characteristics, density, force, pressure, and heat transfer, with a local cultural context. This integration is relevant in supporting contextual and meaningful learning, while preserving local wisdom amidst the flow of globalization. Suggestions for further research are to develop more ethnoscience-based learning materials from various regions in Indonesia to support a more inclusive and local culture-oriented curriculum.

## **Reference**

- Aikenhead, G. (2001). Students' Ease In Crossing Cultural Borders Into School Science. *Science Education*, 85, 180–188. [https://doi.org/10.1002/1098-237x\(200103\)85:2<180::Aid-Sce50>3.0.Co;2-1](https://doi.org/10.1002/1098-237x(200103)85:2<180::Aid-Sce50>3.0.Co;2-1)
- Banjar, K. P. K. (2019). Application of Appropriate Technology in Efforts to Increase the Production of Cold Powder Craftsmen in Pesayanan Village, Banjar Regency. *Journal of Community Service*, 4(2), 1–6. <https://doi.org/10.34128/mediteg.V4i2.49>.
- Barus, R. (2009). Amidation of ethyl p-methoxy cinnamate isolated from kencur. *Kaempferia Galanga*, Linn.
- Beers, S. & Jane. (2001). *Jamu the Ancient Indonesian Art of Herbal Healing*. Singapore: Periplus Editions (HK).

- Butsat, S., Siriamornpun, & Sirithon. (2010). Antioxidant capacities and phenolic compounds of the husk, bran and endosperm of thai rice. *Journal of Food Chemistry*, 119, 606–613.
- Darmalaksana, W. (2020). *Qualitative Research Methods of Literature Study and Field Study*. Bandung: UIN Sunan Gunung Djati Digital Library.
- Dianzhi, H., Yousaf, L., Xue, Y., Wu, J., & Feng, N. (2019). Review: Mung Bean (*Vigna radiata* L.): Bioactive Polyphenols, Polysaccharides, Peptides, and Health Benefits. *Nutrients* 2019. [https://doi.org/11, 1238](https://doi.org/11,1238); doi:10.3390/nu11061238.
- Fawaida, U., & Abidin, Z. (2023). Exploring the Potential of Local Wisdom in Science Learning: The Role of Religious Values in Improving Students' Conceptual Understanding.
- Fitriyani, H., Adisendjaja, Y. H., & Supriatno, B. (2021). Local potential of mangrove Pangkal Babu Kuala Tungkal Jambi Province as a source of learning biology. *Journal of Physic: Conference Series*, 1806(1). <https://doi.org/10.1088/1742-6596/1806/1/012152>
- Jumarani, L. (2009). *The Essence of Indonesian Spa: Spa Indonesia, Javanese and Balinese Style*. Jakarta: PT Gramedia Pustaka Utama.
- Kaban, K. B., & Sinaga, H. (2021). Benefits of Turmeric Rhizome to Reduce Fatty Liver in Obesity in Tanjung Gusta Village, Medan. *Journal of Mitra Keperawatan Dan Kebidanan Prima.*, 1(2), 2722–1083.
- Kartodimedjo, S. (2013). *Beauty with Herbs, Secrets of the Palace Princess*. Yogyakarta: Citra Media Pustaka.
- Keraf, S. (2006). *Environmental Ethics*. Kompas: Jakarta.
- Kim, H. J. (2016). *Characteristics of Qualitative Descriptive Studies: A Systematic Review*. Research In Nursing & Health. USA: Wiley Periodicals.
- Laily, N. N., & Fawaida, U. (2024). Implementation of The Ethno-Stem Approach ( Science, Technology, Engineering, and Mathematics ) in Science Learning to Improve Critical Thinking Skills and Interest of Students. *Jurnal Tarbiyatuna: Jurnal Kajian Pendidikan, Pikiran dan Pengembangan Pendidikan Islam*, 5(1), 70–85. <https://doi.org/10.30739/tarbiyatuna.v5i1.3353>
- Madjid, E. (2011). *500 Secrets of Natural Beauty*. Jakarta: Gramedia Widisarana Indonesia.
- Mayasari, T. (2017). Integration of Indonesian Culture with Science Education. *Proceedings of the National Seminar on Physics Education*, 3.
- Mellyzar, Sriyati, S., Liliawati, W., & Retnowulan, S. R. (2024). Ethnoscience Study as a Source of Science Learning in the Process of Making Minyeuk Pliék U: Traditional Products from Aceh. *Journal of Mathematics and Science Education*, 12(1), 62–71. <https://doi.org/10.21831/jpms.v12i1.72564>
- Putri, A., Qomaria, N., & Wulandari, A. Y. R. (2022). Ethnoscience Study on Traditional Herbal Medicines of the Sumenep Palace and Its Relation to Science Learning in Junior High Schools. *Journal of Mathematics and Science Education*, 12(4). <https://doi.org/10.37630/jpm.v12i4.762>
- Rejeki, R. A., Adnan, M. F., & Siregar, P. S. (2020). Utilization of Learning Media in Integrated Thematic Learning in Elementary Schools. *Basicedu Journal*, 4(2), 337–343.
- Rikizaputra, Firda, A., & Elvianasti. (2022). Ethnoscience Study of Green Glutinous Rice Tapai. *Journal of Biology Education*, 9(2), 238–247.

- Silla, E. M., Dopong, M., Teuf, P., & Lipikuni, H. F. (2023). Ethnoscience Study of Usaku Special Food (Corn Flour) as a Physics Learning Media. *Journal of Physics Education Literacy*, 4(1), 30–39.
- Sundari, S., Rusilowati, A., & Marwoto, P. (2020). The Development Of Science Learning Material With Local Wisdom Content To Train Students' Critical Thinking. <https://doi.org/10.4108/Eai.29-6-2019.2290286>
- Tamara, L., Andriani, S., & Helmiawati, Y. (2017). Making Parem Preparations from Kencur (Kaemferia galanga L) Rice (Orizasetiva) and Lemongrass (Cymbopogon citratus) as Healing for Bruises, Swelling and Sprains. *Journal of Holistic and Health Sciences*, 1(1). <https://doi.org/10.51873/jhhs.v1i1.6>
- Ueangchokchai, C. (2022). Process of Local Wisdom Transfer to Promote Good Relationship between the Elderly and New Generations. *Higher Education Studies*, 12(3), 86. <https://doi.org/10.5539/hes.v12n3p86>
- Utami, A. W., & Kurniawan, A. P. (2023). Beauty Care Ingredients Used at Kraton Yogyakarta Hadiningrat, Indonesia. *Journal of Tropical Biology*, 23(4), 141–149.
- Yuliani, W. (2018). *Qualitative Descriptive Research Methods in the Perspective of Guidance and Counseling*. Quanta: Jakarta.
- Yuliati, E., & Binarjo, A. (2010). The Effect of Rice Flour Particle Size on the Dead Skin Cell Lifting Power of Cold Powder Scrub, Faculty of Pharmacy, Ahmad Dahlan University. *Proceedings of the XVIII Scientific Congress and National Working Meeting*, 378–382.