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THE INTEGRATION OF PARAM AS TRADITIONAL MEDICINE OF KARO ETHNIC IN SCIENCE LEARNING AT JUNIOR HIGH SCHOOL BY USING ETHNOSCIENCE APPROACH

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ABSTRACT

This study aims to examine the indigenous knowledge of the traditional oil formulation of the Karo ethnic using an ethnoscience approach. The ethnoscience approach is a learning method that reconstructs indigenous science into scientific knowledge. This research is a descriptive qualitative study. Data was collected through a literature review, observations, and interviews with the Karo ethnic residing in Medan. The results show that the Paeam formulation involves various types of spices, leaves, and roots. There are 4 plant species used as ingredients in the preparation of *param*, they belong to 8 different plant families.The family with the most species is Zingiberaceae, with 6 species. Based on the results obtained, the study further explores indigenous science using an ethnoscience approach. The reconstruction of indigenous knowledge into scientific knowledge in the processing of Paraml can be observed in the following stages: 1) The collection of spices and, 2) The Process of Making *Param*. The integration of param processing into Junior High School science learning can be seen in the topics of classification of living things (grade VII), element, compound, and mixture (grade VIII), and temperature, heat, and expansion (grade VII). It can be concluded that the processing of param is integrated with science learning at the junior high school

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INTRODUCTION

The Merdeka Belajar curriculum offers students the freedom to learn according to their potential and characteristics. One strategy that can facilitate this is through ethnoscience. Ethnoscience is a learning approach that uses local knowledge as a source/learning object, which can be integrated into lessons presented in a contextual manner. Ethnoscience is an approach that uses local knowledge as a source/learning object, which can be integrated into lessons presented in a contextual manner (Lidi et al., 2022). Learning that presents real-life learning objects in accordance with students' daily lives is also one of the characteristics of Science Education (IPA). Science (Natural Science/IPA) and ethnoscience (indigenous science) are two different concepts. Science is a body of knowledge acquired systematically through the use of scientific methods. In contrast, ethnoscience refers to the knowledge of a community as a socio-cultural construct, which is obtained in various ways, both scientific and non-scientific.(Mukti et al., 2022).

Ethnoscience-based science education is a learning approach that reconstructs indigenous knowledge into scientific knowledge. Ethnoscience-integrated learning is an innovative approach in education that combines culture with science. The integration of ethnoscience in long-term learning will influence students' awareness in utilizing knowledge and technology to provide solutions and protect the environment (Putri et al., 2022). The ethnoscience approach in the learning process is necessary to minimize the erosion of Indonesia's local cultural values due to the strong currents of globalization, which bring about clashes between cultural values and local wisdom.

Talking about local wisdom that can be integrated with science (IPA) using the ethnoscience approach, North Sumatra is one of the provinces in Indonesia that consists of a multicultural society. The indigenous communities (ethnic groups) living in North Sumatra possess unique local wisdom, such as language, arts, handicrafts, traditional medicines from nature, healing processes, cooking methods, the utilization of nature, and more (Suharyanto et al., 2019). In every ethnic group, traditional knowledge or indigenous knowledge has become one of the most important aspects of life, even serving as a cultural identity with its own belief system. One of the ethnic groups in North Sumatra is the Karo ethnic group. Traditional medicine in this ethnic group is considered unique because the remedies are made from herbal plants that are mostly found only in the Karo region.

Talking about the use of herbal plants, in general, is not actually a new topic. Since the emergence of humans on Earth, nature has already existed. From nature, humans have strived to meet their needs, including food, medicine, cosmetics, rituals, and so on, in order to address the various challenges they face in life. Various local plants continue to thrive in Indonesia, particularly in North Sumatra. The people of North Sumatra often make use of processed herbal plants in one of the ethnic groups in the region (Pandapotan et al., 2018). One such product is param, a processed herbal remedy that is well-known for its benefits to the general public.

Param is one of the traditional Karo medicines used for healing and health care. There are two types of kuning (param) discussed: Param melas (hot param) and param mbergeh (cold param). Param contains knowledge and beliefs of the Karo ethnic that have been passed down through generations (Simanjuntak, 2022). Param has many benefits as an alternative treatment, especially for fever and bloating. The quality of Param is highly effective and practical to carry anywhere. Param can be used by both children and adults. When experiencing a fever, we can apply Param all over the body repeatedly to restore normal body temperature. Param is also made from traditional spices of the archipelago that are readily available around us, making it easy to obtain the ingredients(Ginting et al., 2023) .

This study aims to describe and reconstruct scientific knowledge related to the traditional medicine of the Karo ethnic, specifically param. The Indigenous knowledge within the community regarding this traditional medicine needs to be explored, investigated and examined and then transformed into scientifically accountable knowledge. The findings will later be integrated into middle school science education materials, as part of an effort to introduce students to Karo traditional medicine and its processing and to connect this knowledge with scientific content and understanding

RESEARCH METHODS

The type of research used in this study is qualitative descriptive research. The subjects who will serve as informants in this study are the local Karo ethnic residing in Medan City. The data sources used in this study are both primary and secondary data. Primary data are obtained through interviews and direct observations of the Karo ethnic, then identification of traditional medicinal ingredients of param in the Biology Laboratory of FMIPA UNIMED. Secondary data are derived from theoretical studies related to the processing and application of param.

The primary data, which consist of indigenous knowledge, are analyzed using an ethnoscience approach. The ethnoscience approach is a learning method that reconstructs indigenous science into scientific knowledge. The results of the reconstruction of the community's original knowledge become scientific knowledge and are then integrated into the materials found in the Junior High School Science curriculum

RESULTS AND DISCUSSION

Param is an external medicine applied to areas of the body other than the forehead and abdomen. Param can be applied to the thighs down to the ankles, the upper arms to the lower arms, and the back. It is used from the first day after childbirth up to 44 days (Zuliyanti et al., 2021). There are four types of param: param for children aged 0-12 years, param for teenagers in the form of a cooling powder, which includes mint leaves in its composition, param for adults, which is intended for women who have just given birth, and param for the elderly, which contains more ginger compared to the other types.

The preparation of parem in the Batak Karo sub-ethnic group is based on the philosophy of *kesaya silima-lima* (*kesaya* = medicine; *silima lima* = five). *Kesaya silima-lima* refers to the five basic types of plants used in making the remedy, namely *bahing* (Zingiber officinale Rosc.), *lada* (Piper nigrum L.), *keciwer* (Kaempferia galanga), *pia* (Allium cepa), and *lasuna* (Allium sativum) (Silalahi, 2020).

Parem is used by adding water and then applying it to the entire body. The thickness of the parem is influenced by the amount of water in the mixture. Parem has warming effects, improves sleep quality, makes the body feel fresher, and helps make the skin smoother and cleaner (Nasution et al., 2022).

Param is a traditional Karo medicine made from a mixture of flour and herbal ingredients that have medicinal properties. The flour commonly used is rice flour, as the Karo people believe that rice symbolizes health and prosperity. The medicinal mixture consists of ingredients or blends from plants such as roots, stems, leaves, flowers, fruits, as well as animal fats and water(Simanjuntak, 2022).

Several plant species are used as basic ingredients in the preparation of *param*, as shown in Table 1 below.

Table 1. Plant Species Used in the Preparation of *Param*

No	Scientific Name	Local name	Family	Used organ
1	*Oryza sativa* L.	Padi	Poaceae	seed
2	*Curcuma domestica* Valeton	Kunyit	Zingiberaceae	Rhizome
3	*Allium cepa* L	Bawang merah	Liliaceae	Umbi
4	*Allium sativum* L.	Bawang putih	Liliaceae	Umbi
5	*Myristica fragrans* Houtt.	Pala	Myristicaceae	Buah
6	*Zingiber montanum*	Bengle	Zingiberaceae	Rhizome
7	*Piper nigrum* L.	Lada	Piperaceae	seed
8	*Curcuma xanthorrhiza* Roxb.	Temulawak	Zingiberaceae	Rhizome
9	*Citrus aurantifolia* Swingle	lime	Rutaceae	fruit
10	*Kaempferia galangal* L.	Cekur, Cikur, Kencur	Zingiberaceae	Rhizome
11	*Mentha piperita* L.	Mint	Lamiaceae	leaf
12	*Curcuma heyneana* Valeton & Zijp	Temugiring	Zingiberaceae	Rhizome
13	*Zingiber officinale var. Rubrum* Theilade	Jahe merah	Zingiberaceae	Rhizome
14	*Hibiscus rosa-sinensis* L.	Bunga raya	Malvaceae	flower

There are 14 plant species used as ingredients in the preparation of *param*, they belong to 8 different families (Table 1). The family with the most species is Zingiberaceae, with 6 species (Figure 1)

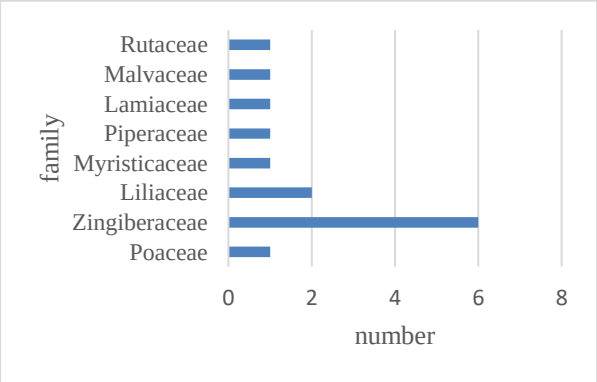

Figure 1. The number of species in each family used in the preparation of *param*

Zingiberaceae is a plant family known for its medicinal properties and is widely used by the Karo ethnic group as a traditional remedy. The various plant species from the Zingiberaceae family have diverse benefits and are frequently used by the Karo people in traditional medicine. One of the benefits of Zingiberaceae plants is to treat colds and serve as a body warmer (Hati et al., 2023).

The plant organs used in the preparation of *param* include leaves, flowers, fruits, seeds. and rhizomes. Rhizomes are the most commonly used organ, accounting for 42.9% (Figure 2.)

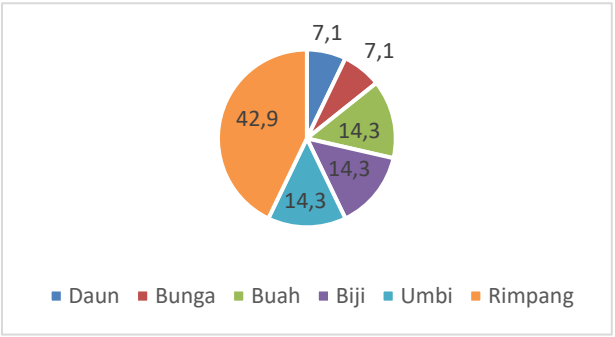

Figure 2. The percentage of plant organs used in the preparation of *param*

Table 2. Reconstruction of Traditional Knowledge into Scientific Knowledge in the Preparation of *Param*

No.	Process	Indegenious science	Scientific knowledge	Explanation
1.	The process of collecting spices	Cleaning and Grinding All Spices	The principles of friction and pressure	The process of washing spices helps to remove microorganisms such as bacteria and fungi. During the grinding process, physical principles such as pressure and friction come into play.
2.	The process of making *param*	The ground spices are mixed with flour and shaped into balls or squares, then sun-dried for 5 days to a week until completely dry	Principles of Force and Heat Transfer	The process of shaping the food into balls involves the principles of several forces: the pressure force, which helps flatten the surface of the *param* being molded; the cohesive force (which helps the dough remain intact when shaped into a ball); and the adhesive force (which helps maintain the round shape and prevents cracking). The drying process involves the principles of heat transfer, where drying occurs through radiation (the transfer of heat from the sun to the spices until they are dry) and convection (the air surrounding the spices helps in the evaporation of moisture from the spices).

Table 3. Integration of *Param* Preparation into Science Curriculum at the Junior High School Level

biology		
Content	**Basic Competencies**	**Explanation**
Classification of Living Organisms (Grade VII)	Classifying living organisms and objects based on observed characteristics \	Viewed from the classification of living organisms, the plant species used as ingredients in *param* include rice flour (*Oryza sativa*), turmeric (*Curcuma domestica*), nutmeg (*Myristica fragrans*), Java ginger (*Curcuma xanthorrhiza*), lime (*Citrus aurantiifolia*), aromatic ginger (*Kaempferia galanga*), garlic (*Allium sativum*), peppermint (*Mentha piperita*), black pepper (*Piper nigrum*), fingerroot (*Zingiber montanum*), white turmeric (*Curcuma heyneana*), shallots (*Allium cepa*), red ginger (*Zingiber officinale var. rubrum*), and hibiscus (*Hibiscus rosa-sinensis*). The classification of living organisms can be associated with the various plant species found in *param*
Chemistry		
Content	**Basic Competencies**	**Explanation**
Elements, Compounds, and Mixtures (Grade VIII)	Explaining the concepts of mixtures and pure substances (elements and compounds), physical and chemical properties, and physical and chemical changes in daily life	Viewed from the subtopic of **'mixtures'**, where two or more substances are combined, the materials that have been processed into powders are an example of a **homogeneous mixture**, containing active compounds from turmeric, ginger, and other ingredients. These are ground into a liquid form and then combined into a solid with flour.
Physics		
Content	**Basic Competencies**	**Explanation**
Temperature, Heat, and Expansion (Grade VII)	Analyzing the concepts of temperature, expansion, heat, heat transfer, and their applications in daily life.	Viewed from the topic of 'Temperature', the preparation method involves blending all the ingredients with water, without adding flour initially. Once the ingredients are blended into a smooth mixture, they are combined with the flour in a container, then shaped into balls or squares. The mixture is then sun-dried for 5 days to a week until completely dry. The process of making *param* can be related to the science topic of 'temperature', where temperature is a physical quantity that can only be sensed by the senses. In the process of making *param*, the mixture, which starts cold, is dried under the intense heat of the sun. The strong sunlight helps solidify the *param*, making it dense and suitable for production.

Based on Tables 2 and 3, it can be concluded that ethnoscience can be integrated with Physics, Chemistry and Biology teaching and learning The integration of the param production process in science learning is an ethnoscience approach applied in science learning in junior high schools. The ethnoscience can be integrated with the natural sciences teaching and learning through the adjustment of the instructional models, materials, and media so that it can emphasize on students' background (Wirama et al., 2023). The ethnoscience approach has a positive influence on learning science at school, The implementation of the ethno-science approach in science learning is effective in increasing various abilities and skills of students such as thinking skills, problem-solving skills, process skills and scientific literacy (Pratama & Jumadi, 2023).

CONCLUSION

Based on the results obtained, the study further explores indigenous science using an ethnoscience approach. The reconstruction of indigenous knowledge into scientific knowledge in the processing of Param can be observed in the following stages: 1) The collection of spices and, 2)

The Process of Making *Param*. The integration of param processing into Junior High School science learning can be seen in the topics of classification of living things (grade VII), element, compound, and mixture (grade VIII), and temperature, heat, and expansion (grade VII). It can be concluded that the processing of Param is integrated with science learning at the junior high school.

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