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pleuroptus-ostreatus-as-soger-
7415.pdf
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Submission date: 21-Dec-2020 07:56AM (UTC+0700)

Submission ID: 1479827114

File name: ng-curtain-mushroom-media-pleuroptus-ostreatus-as-soger-7415.pdf (242.76K)

Word count: 2814

Character count: 15771



Development of biological learning model using curtain mushroom media (*Pleuroptus ostreatus*) as soger meat

Elsje Theodora Maasawet ^{1*}, Elsje Palenewen ¹, Wahyu Sekti Retnaningsih ¹

¹ Biology Education Study Program, Biology Education Magister, Faculty of Education and Pedagogy, the University of Mulawarman, INDONESIA

*Corresponding author: emaasawet@gmail.com

Abstract

Oyster mushrooms contain mineral salt which presents higher than lamb. Important mineral contents in oyster mushrooms include iron (Fe), phosphorus (P), potassium (K), sodium (Na), and calcium (Ca). The aims of the research are to produce innovative products for students and the public in utilizing oyster mushrooms (*Pleuroptus ostreatus*), to provide a solution for traders to use oyster mushrooms (*Pleuroptus ostreatus*) in processing sogers, so that the oyster mushroom (*Pleuroptus ostreatus*) can be enjoyed by all circles, especially the community of people down. This research includes Quasi Experiment Research (quasi-experimental research). The population of this study is the eleventh grade students of SMAN 1 Samarinda, the eleventh grade students of SMAN 2 Samarinda, and Community of Tanah Merah Village.

30.00% of the eleventh grade students of SMAN 1 Samarinda made use of oyster mushrooms, while 70.00% of grade XI students of SMAN 2 Samarinda had never used oyster mushroom media, and 50.00% of community of Tanah Merah village used oyster mushrooms as vegetables and side dishes.

Keywords: oyster mushroom (*Pleuroptus ostreatus*), soger, quasi research experiment

Maasawet ET, Palenewen E, Retnaningsih WS (2019) Development of biological learning model using curtain mushroom media (*Pleuroptus ostreatus*) as soger meat. *Eurasia J Biosci* 13: 2361-2364.

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INTRODUCTION

Realizing a quality generation must be made a real change in the learning process at school. Teachers who understand the quality of education are teachers who know the weaknesses of their students (Sastrawati et al. 2011). The success of students at the level of education does not escape from how teachers teach students in class. As an implementation of education that teachers must know is learning that requires active students (student centers) involving students to search, answer, and find bright ideas to complete a task while learning, and not an active teacher.

East Kalimantan is one of the regions that has considerable natural resources and potential biodiversity that includes forest resources, minerals and energy, attractions, fisheries, animals and plants, flora and fauna services, and other associated forest products that also have high economic value, such as resin, aloes, bird's nest, rattan and others (Admin Kaltim 2012).

Independent students are responsible for their own learning process and are willing to improve their abilities throughout their careers. Herring (2012) argues that independent students get motivation within themselves. They understand that the spirit of learning is a basic ability that will make them successful at work.

Problem Based Learning (PBL) is a student-centered learning model that focuses its learning on the form of

real problems so students have curiosity to solve the problems. The strength of the problem based learning (PBL) model lies in solving the learning problem so that it can stimulate students' abilities. One of these skills is students' ability to think critically on a concept.

Nurhadi and Senduk (2004) and Arends (2008) state that problem based learning is a teaching approach that uses real world problems as a context for students to learn about critical thinking in problem solving.

Qing et al. (2010), said that inquiry learning can improve students' ability to integrate theory with practice and involve students in critical thinking. Pevelich and Abraham (1977) state that guided inquiry learning in the selection of experimental plan problems is carried out by the teacher, while the data analysis plan and making conclusions are carried out by students. This is corroborated by Suchman (1982) suggesting that guided inquiry is learning planned to train students to carry out the research process.

Of the various models studied in Models of Teaching (Joyce et al. 2000), inquiry teaching model is one of the cognitive models that is superior for science learning at school. The role of inquiry in science education was

Received: June 2019

Accepted: November 2019

Printed: December 2019

revealed by Rutherford (in Romey 1968: 264) by linking inquiry with "content". He concluded that: "... the emphasis has been on viewing scientific inquiry as part of the content of science itself".

White oyster mushroom is one of the agricultural products that has a high nutritional content compared to other mushrooms. In addition to its high nutritional content, it also has health benefits as a vegetable protein that does not contain cholesterol so that it can prevent the onset of high blood pressure and heart disease (Pasaribu et al. 2002).

The results of our observations made at SMAN 1 and SMAN 2 Samarinda through interviews and questionnaires illustrate that generally the implementation of the learning process in the classroom still tends to be monotonous because the method used is still lecturing. Learning activities are less effective and saturating because they do not actively involve students. This has an impact on low students' cognitive outcomes and nonoptimal critical thinking skills in solving problems. Furthermore, this may lead to an issue and a big task which needs a solution. Interviews were also conducted in the Tanah Merah village in several RTs regarding the use of oyster mushrooms. The results of interviews with the community revealed that the community is less innovative in utilizing oyster mushrooms (*Pleuroptus ostreatus*) because so far it has only been cooked as a vegetable and stir-fry for side dishes.

Responding to the problem of learning in schools, the authors make a breakthrough and find solutions to make teachers and students become active and creative through learning a scientific approach combined with PBL and inquiry models. In addition, based on the interview result, the researchers made a new breakthrough by creating an innovation oyster mushroom (*Pleuroptus ostreatus*) as meat in burgers and meatballs.

METHOD

The research method used was Quasi Experiment Research (quasi experimental research). The purpose of this research is to produce innovative products for students and the community in utilizing oyster mushroom (*Pleuroptus ostreatus*), to provide solutions to the public (traders) in order to utilize oyster mushroom (*Pleuroptus ostreatus*) in processing soger, so that oyster mushroom products (*Pleuroptus ostreatus*) can be enjoyed by all groups, especially the lower classes, as well as to increase knowledge to students and teachers so that the learning process is fun. This research is a Quasi Experiment Research study (quasi experimental research). The population in this study was students of class XI IPA of SMAN 1 Samarinda, SMAN 2 Samarinda and RT 29 and 30 Tanah Merah village.

RESULTS AND DISCUSSION

Based on the results of interviews with eleventh grade students at SMAN 1 Samarinda, the process of learning biology has been quite good so far but there are some things that sometimes make the classroom boring / less enjoyable. Lecturing method often causes many students sleepy and bored. In addition, laboratory practice is rarely done so that students do not understand the material of mushrooms. Some students do not understand the benefits of oyster mushrooms (*Pleuroptus ostreatus*). The results of interviews with students of class XI at SMAN2 Samarinda revealed that biology lesson was fun yet saturating. This is because learning is glued to the book and lacks innovation, the material is large but the way to deliver it to students is not creative enough so that there are some students who do not understand the various kinds of mushroom material, especially oyster mushroom (*Pleuroptus ostreatus*). The laboratory practice is lacking a lot and less innovative so students are not motivated in studying biology. The results of interviews with the Tanah Merah village community have revealed the benefits of oyster mushroom (*Pleuroptus ostreatus*) as vegetables and side dishes. Lack of attention from the local government regarding oyster mushroom farmers (*Pleuroptus ostreatus*) is an obstacle for sustainable marketing and cultivation. In addition, people in the lower classes also do not know the benefits of oyster mushroom (*Pleuroptus ostreatus*).

Based on the diagram, the recapitulation of knowledge and utilization of oyster mushroom (*Pleuroptus ostreatus*) resulted in an average value of eleventh-grade students at SMAN 1 Samarinda who have eaten oyster mushrooms by 30%. Meanwhile, the average results obtained in class XI SMAN 2 Samarinda is 26%, this is due to the lack of material about oyster mushrooms, the benefits of oyster mushrooms and only a few of students who have experienced oyster mushrooms. In addition, it appears that students only knew a few of the types of mushrooms such as herbal medicine and mushrooms attached to trees / wood. The average results obtained from interviews with the community in RT 29 and 30 Tanah Merah village revealed that most of the mothers already know oyster mushrooms, but the benefits are only known as vegetables and used as a side dish.

Oyster mushrooms have a more complete nutritional content and are richer than other vegetable commodities. Oyster mushrooms have a higher protein and carbohydrate content compared to beef. Fat content is also lower than beef (Martawijaya and Nurcahyadi 2010).

Apart from being a source of protein, vitamins and minerals, oyster mushrooms also contain compounds that function as anticancer or antitumor, anticholesterol, and antioxidants. Lectin compounds in white oyster

mushrooms have been proven as antitumor compounds. Based on the results of the study, white oyster mushrooms contain 19-30% protein, 50-60% carbohydrates, amino acids, vitamin B1, vitamin B2, vitamin B3, vitamin B5, vitamin B7, vitamin C, and other minerals (Sumarsih 2015).

Basically, oyster mushroom (*Pleuroptus ostreatus*) can be used by various kinds of preparation such as side dishes (vegetables and stir-fry) and crispy mushrooms. Researchers have made innovations to make trimmed mushrooms as a substitute for meat in soger. The lower classes, traders, and students can try their best to invade practices by processing oyster mushrooms (*Pleuroptus ostreatus*) as meat in sogers (meatballs and burgers). The results obtained are very satisfying because students look enthusiastic about participating in practicum and can make healthy products. Among the people, especially mothers, they are also very enthusiastic and happy because they can make new types of food that are affordable and healthy.

Meatballs and burgers are generally made from beef / chicken but high price becomes a problem so that not all people can enjoy them. Health factor is also a consideration because consuming too much meat is not good for health. It can lead to cholesterol, high blood pressure and obesity. With the new innovation, namely oyster mushroom (*Pleuroptus ostreatus*) as a substitute for meat in Soger, it can help problems that occur in the community and can be used as a part of laboratory practice in schools which helps students more creative.

After laboratory practice, students and the community do the assignment to create projects in groups to produce soger products with oyster mushroom fleshy by selling it. The results obtained 30% of the eleventh-grade students of SMAN 1 Samarinda can utilize oyster mushrooms processed into soger that can be sold in the school environment, while 70% of the eleventh-grade students of SMAN 2 Samarinda can utilize oyster mushrooms processed to become sogers can be sold in the school environment and in their respective residential neighborhoods. People living at RT 29 and RT 30 in Tanah Merah village use oyster mushrooms to be processed into soger meat, and are sold in residential environment and marketed at 50%. The interview results obtained many obstacles faced, for example students are still constrained by time at school and lack of collaboration with the team. Mothers with a lot of also activities need to innovate their ideas.

According to Trianto (2009), inquiry is a series of learning activities that involve all students' abilities to search and investigate systematically, critically, and analytically so that they can formulate their own findings with confidence, whereas guided inquiry is inquiry activity in which problems are raised by the teacher or source from books then students work to find answers to these problems under intensive guidance from the

teachers. Plans are made by the teacher and students do not formulate problems.

Corebima (2001) states that critical thinking skills will develop if intentionally developed. Efforts to develop critical thinking can be done through learning activities, so that the learning activities will then have an impact on the development of students' metacognitive abilities. The Conference Board survey results (2006, cited Scott, 2015b) find that professionalism, good work ethics, oral and written communication, teamwork, collaboration, critical thinking and problem solving skills are the most important skills.

Mutual respect and tolerance are essential to ensure that the views of individuals from all cultural backgrounds are recognized and respected in a multicultural society. Teachers can use student responses as an opportunity to evaluate their readiness to learn more deeply, and introduce new concepts that are appropriate to challenge their thinking (Bolstad 2011).

Project-based learning and problem-based learning can work well. The teacher must design an activity plan that is suited to the interests and needs of students, and of course adapted to the curriculum. It may not be easy to apply the two learning models with the usual 45 - 50 minutes per hour time allocation, but it can be pursued by alternative scheduling of planned learning activities. Woods (2014) states that project-based learning and problem-based learning ultimately require a change in the teacher's role from being a 'source of knowledge' to become a trainer and facilitator to gain knowledge. For some teachers, it might cause discomfort with the shift from teacher-centered learning to student-centered learning. Project-based learning and problem-based learning are ideal learning models to meet the educational goals of the 21st century because they involve the 4C principles of critical thinking, communication, collaboration and creativity (critical thinking, communication, collaboration and creativity).

COVER

The expectation of this research is to create innovations in food and health, so that people, especially the poor, can make meatballs and burgers with oyster mushroom flesh (*Pleuroptus ostreatus*). It also help traders innovate in making various foods including meatballs and burgers and they do not worry about the expensive meat. For students, this research is helpful to create new and healthy products so that it can be used as a practicum at school.

CONCLUSION

1. Soger fleshy oyster mushroom (*Pleuroptus ostreatus*) can create business opportunities and become a product that is favored by all circles

2. Students can innovate oyster mushrooms to be process soger at school

3. People can enjoy healthy and affordable food by creating innovations from oyster mushrooms made from processed Soger meat.

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