

MISELIUM PADDY STRAW MUSHROOM (*Volvariella volvacea* (Bull.) Singer) GROWTH RESPONSE ON MASTER BREED MEDIA (F1)

Endah Murwandari, Periadnadi Periadnadi* and Nurmiati Nurmiati

Postgraduate Biology, Faculty of Mathematics and Natural Sciences Andalas University, Padang.

*Corresponding Author: Periadnadi Periadnadi

Postgraduate Biology, Faculty of Mathematics and Natural Sciences Andalas University, Padang.

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ABSTRACT

Paddy Straw mushroom (*Volvariella volvacea* (Bull.) Singer) is a compost mushroom that is widely used by the community, one of which is used as food ingredients and medicinal ingredients. Paddy Straw mushroom cultivation is very difficult to find in the Sumatran region, one of the contributing factors is that it is difficult to get the seeds used for cultivation of Paddy Straw mushroom. The seeds used for cultivation are parent seeds (F0). The parent seed media usually uses corn kernels. Corn seeds have a lot of ingredients needed to spur the growth of mycelium Paddy Straw mushroom. The content contained in corn seed media in the form of carbohydrates, starch, protein, minerals and vitamins that are used as nutrients for the growth of mycelium Paddy Straw mushroom. The purpose of this study is to determine the growth response of the Paddy Straw mushroom mycelium in the parent seed media with natural formulations. This study uses the experimental method and the data are analyzed descriptively. Based on the results obtained on the growth response of mushroom mycelium in the parent seed media (F1) using several natural formulations obtained the highest growth of Paddy Straw mushroom mycelium, namely by adding natural formulations of bean sprouts boiled water with a dense and thick white mycelium.

KEYWORDS: Paddy Straw mushroom (*Volvariella volvacea* (Bull.) Singer), corn seed, parent seed (F1).

INTRODUCTION

Paddy Straw mushroom (*Volvariella volvacea* (Bull.) Singer) is a compost mushroom that is popular with many people because it tastes good and can be used as a variety of dishes. Paddy Straw mushroom is one of the food sources that have high nutritional value and is easily cultivated in the tropics and sub-tropics such as Burma, Vietnam, Japan, China, and Indonesia (Nurmiati, Periadnadi, 2015). Paddy Straw mushroom is a food with good nutrition, from the results of research, the average mushroom contains 19-35% protein is higher than rice (7.38%) and wheat (13.2%). Essential amino acids found in mushrooms, there are about 9 types of 20 known amino acids, 72% of the fat is not saturated, mushrooms also contain various types of vitamins including B1, B2, B7 and niacin (nicotinic acid vitamine). In addition to micro elements, mushrooms also contain various types of minerals including K, P, Ca, Na, Mg, and Cu (Sunandar, 2010). In addition, Paddy Straw mushroom has been known as a drug and food ingredient and was cultivated before the 18th century or around 2000 years ago in China. (Sinaga, 2012).

Paddy Straw mushroom production, especially in West Sumatra is still constrained in the supply of seeds F0, F1 and F2. Provision of seeds is very important in

supporting efforts to increase production to meet community needs. The seeds used as cultivation of Paddy Straw mushroom in West Sumatra are from Java. The length of delivery results in a decrease in seed quality. Whereas Oei (1996) stated that quality seeds must come from pure and free of contamination so that the production of Paddy Straw mushroom is more optimal. So that it is necessary to provide F0, F1 and F2 seeds in West Sumatra to meet the demand for seeds for cultivators Paddy Straw mushroom.

Making parent seeds (F1) is one way to meet seed stocks for cultivators Paddy Straw mushroom. Making parent seeds is usually cultivators using corn kernels as a medium for growth of Paddy Straw mushroom. The use of corn seeds is due to the fact that corn kernels are easily available, cheap prices and available nutrients in corn kernels are needed by the mushroom as the growth of the mycelium Paddy Straw mushroom. According to Suarni and Widowati (2016), the nutritional content of corn seeds consists of starch, protein, fat, dietary fiber (carbohydrates, hemicellulose, cellulose, lignin), minerals (P, K, Ca, Mg, Na, Fe, Cu, Mn, Zn), and vitamins (vit. A and vit. E). These nutrients are utilized by the Paddy Straw mushroom mycelium for growth.

Based on this, corn seeds soaked in ordinary water (control), corn seeds soaked in leri water, corn seeds soaked in bean sprouts, and corn seeds soaked in potato water can be used as a medium for parent seed Paddy Straw mushroom. In this research, mother seedlings will be made using corn kernels. This is done to support the productivity of the Paddy Straw mushroom fruit body.

METHODS AND MATERIALS

a. Media Supply for Parent Seedlings

The raw material for the parent seed is corn seeds which are soaked for 12 hours in distilled water, then washed thoroughly and boiled for 20-30 minutes until the corn grain is soft enough, but not broken and broken (Yumna, 2014). Corn is drained, then dipped into the most responsive media formulation for Paddy Straw mushroom mycelium growth on agar media (3 treatments). As a control, the corn is not rinsed with soaking water, then 1% bran is added. Corn seeds are put into glass bottles with a volume of 350 mL of 200 grams. The bottle is covered with cotton stoppers and newspapers and labeled according to the treatment. Then sterilized using autoclave with a temperature of 121 °C and a pressure of 15 lbs and 30 minutes.

b. Inoculation of mycelium from agar media to mother seed media

Paddy Straw mushroom mycelium from agar media with the fastest growth of mycelium (3 treatments) inoculated on parent seed media. Taking the mycelium from the media to be carried out by means of medium cut with cork borer, then inoculated into the medium of the parent seed which had previously been given the same treatment. After being inoculated the bottle is closed using sterile cotton and newspaper paper, then incubated until the Paddy Straw mushroom mycelium grows. As well as measuring the growth of the Paddy Straw mushroom mycelium periodically every 2 days until the Paddy Straw mushroom mycelium reaches the bottom of the bottle (Yeni, 2017).

RESULTS AND DISCUSSION

The growth of mycelium which has the best response on the agar media by adding natural formulations (potato water, bean sprouts and leri water), then inoculated on the parent seed media. Observation of the speed of growth of the Paddy Straw mushroom mycelium on parent seed media was carried out by measuring the speed of growth of the mycelium filling the bottle. The measurement of mycelium length in the parent seed media is observed periodically every 2 days. The following is the Paddy Straw mushroom mycelium growth curve in the parent seed media.

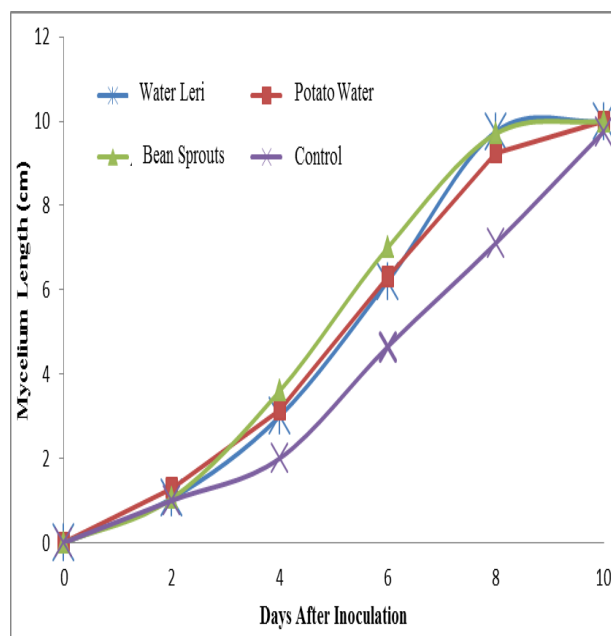


Figure 1: Paddy Straw mushroom Mycelium Growth Curve in Main Seed Media (Corn Media) with Treatment Dyed with Natural Formulation of Potato Water, Bean Sprouts, Water Leri and Control.

Based on Figure 1. the fastest time needed by Paddy Straw mushroom mycelium to fulfill the medium of parent seed (corn) is 8 HSI (days after inoculation) with treatment of soaking seedlings with stew of bean sprouts and decoction of leri water with growth duration of 10 cm / 8 HSI. As for the lowest growth speed with a growth duration of 10 cm / 10 HSI, that is, on treatment (control). The highest growth rate was obtained from the treatment of boiled water and boiled water, this was allegedly because the decoction of bean sprouts and decoction of leri water contained nutrients needed by Paddy Straw mushroom mycelium as growth. According to Maulana (2012) the addition of bean sprouts is very good because the nutritional content found in boiled water is very much. Nutrients contained include protein, carbohydrates, sulfur, calcium, phosphorus, potassium, vitamins, and amino acids. Whereas in decoction of leri water also has nutrients that can spur the growth of the mycelium Paddy Straw mushroom. According to Rahmatan and Supriatno (2016), the nutrients contained in leri water include nitrogen, phosphorus, potassium, magnesium, sulfur, iron, vitamins. So that the nutrients possessed by both cooking water added to the parent seed media greatly affect the speed of growth of the mycelium Paddy Straw mushroom.

One that affects the growth of mycelium from Paddy Straw mushroom is nutrition contained in the growing media which is used as an energy source to spur the growth of mycelium Paddy Straw mushroom. Corn is one of the medium of parent seeds that is often used by farmers because corn has a nutritional source needed for the growth of Paddy Straw mushroom mycelium, but Paddy Straw mushroom requires adding nutrients from

the outside as a mixture of parent seed media. Paddy Straw mushroom mycelium growth can take place more optimally if the mother seed contains a lot of nutrients needed by the Paddy Straw mushroom mycelium. According to Suharnowo *et al.* (2012); Widyastuti and Tjokrokusumo (2008), stated that to get more optimal results in the growth rate of fungal mycelium there must be assistance from outside nutrients in addition to nutrients contained in the main media. According to Yumna (2014), soaking corn kernels by treating several natural formulations (potato juice, bean sprouts, and straw water) greatly influenced the growth rate of Paddy Straw mushroom mycelium compared to without treatment (control). The following is a picture of the Paddy Straw mushroom mycelium on parent seed media with various treatments.



Figure 2: Expression of Paddy Straw Mushroom Mycelium Growth in Media of Master Seedlings (Corn Media) with A. Control Treatment, B. Water Bean Sprouts, C. Water Potatoes, D. Water Leri.

Based on Figure 2. the growth of Paddy Straw mushroom mycelium is seen on the parent seed media with various natural formulations. The treatment of immersion with natural formulations in corn media causes different growth and density of mycelium. The fastest growth treatment of mycelium and thick mycelium is in the treatment of corn dipped in boiled water bean sprouts. Based on the results of observations made, the expression of thick mycelium growth contributes well to the Paddy Straw mushroom contamination, so that the thicker the growth of Paddy Straw mushroom mycelium on a growing medium, the less likely it is to be contaminated.

Nutrients contained in corn media (control) are slowly absorbed by fungal mycelium. Soaking the corn media with natural formulations will make it easier for mycelium to get early nutrition and enrich media nutrition. The best nutrition to be added in the parent seed media is bean sprout water. Mycelium growth in the parent seed media by immersion treatment on bean sprouts dominated from day 2 of observation to the last day of observation (Figure 1). According to Maulana (2012) the addition of bean sprouts is very good because the nutritional content found in boiled water is very much. Nutrients contained include protein, carbohydrates, sulfur, calcium, phosphorus, potassium,

vitamins, and amino acids. All these nutrients are very helpful in the growth of the mycelium Paddy Straw mushroom. In addition, according to Latunra *et al.* (2016) and Sunandar *et al.* (2017) states that green bean sprouts have auxin hormones and cytokinin hormones that function as growth regulators and spur growth.

Mycelium growth in the parent seed media uses corn seeds because corn seeds are easy to find, affordable prices for farmers, and most importantly, corn seeds have nutrients needed by Paddy Straw mushroom mycelium in growth. In addition, the nutrients contained in corn seeds are still not optimal, so external nutrients are used to accelerate the growth of the mycelium Paddy Straw mushroom. External nutrients added to parent seed media include boiled bean sprouts, leri water, and potato water. Based on Figure 1. and Figure 2. addition of nutrients by dipping corn kernels in natural formulations (bean sprouts, water, and potato water) shows the optimal growth rate and density of mycelium compared to controls.

Factors that influence the growth of mycelium from Paddy Straw mushroom include pH, humidity, temperature and nutrients contained in the growing media that are used as a source of nutrition to spur the growth of mycelium Paddy Straw mushroom. In accordance with Maulidina *et al.* (2015) states that the factors that influence the growth of mycelium include environmental factors (temperature and humidity) and nutrient availability. Corn is one of the parent seed media that is often used by farmers because corn has a nutritional source that can spur the growth of Paddy Straw mushroom mycelium, although there are not too many nutrients, so it needs to add nutrients from the outside as a mixture of parent seed media. Paddy Straw mushroom mycelium growth can take place more optimally if the mother seed contains a lot of nutrients needed by the Paddy Straw mushroom mycelium. This is in accordance with Suharnowo *et al.* (2012), in order to obtain more optimal results in the growth of fungal mycelium there must be assistance from outside nutrients in addition to nutrients contained in the original growing media.

CONCLUSION

Response to growth of mycelium Paddy Straw mushroom seedlings (F1) with the addition of natural formulations has an influence on the speed of growth of the mycelium Paddy Straw mushroom. The speed of growth of the Paddy Straw mushroom mycelium is the fastest with the treatment of the addition of boiled water sprouts for 8 days in meeting the medium of the parent seed and the resulting mycelium is denser and thicker in white.

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