I. INTRODUCTION

1.1 Background

Plastics are synthetic polymers that have a degradation life of 200 to 1,000 years (Purwaningrum, 2016). This is because plastics have long repeating chains so it takes a long time to break the long chains into shorter chains (Bhardwaj, 2012). One type of plastic that is often used in everyday life is *Low Density Polyethylene* (LDPE) which is often used as a packaging material (Esmaeili, *et al*.,2013). Based on the assumptions of the Ministry of Environment and Forestry (KLHK), Indonesia produces 189 thousand tons of waste/day and the second most produced plastic waste in the word. Of this amount, 15% is plastic waste or a total of 28.4 thousand tons of plastic waste/day. The Ministry of Environment and Forestry (KLHK) also emphasized that 90% of waste dumped into the sea is plastic waste and 65 million tones of plastic waste in 2020. Plastic waste in Indonesia's oceans is estimated at 187.2 million tonnes per year (Jambeck, *et al*., 2015).

There are several ways to degrade polyethylene, including chemical, photocatalyst, thermal, and biological (Ali, *et al*., 2016). However, most of these plastic degradation methods cannot be applied on a large scale because of the high costs and the resulting pollution. Biological degradation is preferred to overcome *Low Density Polyethylene* (LDPE) waste because this method is considered safer, cheaper, and environmentally friendly. In Biologically methods, polyethylene can be degraded by microorganisms. Biodegradation is a process of breaking down polymers, both natural and synthetic polymers, by biological agents such as fungi or

bacteria (Bhardwaj, 2012). Currently, research on the ability of bacteria as plastic degrading agents has been widely carried out, but there still not a lot of research on the ability of fungi to degrading plastics reported. In contrast to bacteria, fungi can still grow even though not on a specific substrate, even in an acidic environment. It's ability to grow in stressful conditions causes the fungus to be able to produce several enzymes that can be used to degrade organic compounds (Okeh, 2014).

Previous research has showed that from various microorganisms, fungi have the highest biodegradation activity of Low Density Polyethylene (LDPE) (Sen and Raut, 2015). These studies generally only isolated microbes from plastic dumps or landfill, but the previous research has not been carried out on the isolation of microbes from other places such as baglogs, which have the opportunity to have different types of fungi with higher degradation activity. One of the uses of plastic is on fungi baglog packaging. In fungi cultivation, baglog fungi can be contaminated by microbes, namely other fungi. These other fungi can damage the baglog plastic packaging itself. Based on field observations, it was found that some baglogs were contaminated with fungi and damaged the baglog packaging. In this case it can be assumed that the fungus can degrade plastic. The following is a picture of damage to baglog packaging by fungi obtained from *Pleurotus ostreatus* fungi cultivators.

Figure 1.Sample from *Pleorotus ostreatus* Baglog

To what extent the plastic breakdown is due to the growth of these contaminating fungi, it is necessary to carry out further research by isolating these microorganism. By conducting this research, it can be determined which fungi are most effective in degrading plastic so that the negative impact that plastic has on the environment can be minimized. Because this is one of the determinants of the success of environmental improvement that has not been resolved until now.

1.2 Problem Formulation

1. How is the potential of fungal isolates from *Pleurotus ostreatus* baglog to degrading LDPE plastics?
2. What of fungal isolate is the most effective to degrading LDPE plastics?

1.3 Research Objective

1. To determine the potential of the fungal isolate to degrade LDPE plastics.
2. To determine which fungus is the most effective to degrading LDPE plastics.

1.4 Significance of The Research

The significance of this research is to expand scientific information concerning potential fungi from *Pleurotus ostreatus* baglog that have ability to degrade plastic as agent of degradation to minimized the pollution in the environment.