

**IN VITRO SCREENING OF LOW-DENSITY POLYETHYLENE
BIODEGRADING FILAMENTOUS FUNGI ISOLATED
FROM SOILS IN INDANG, CAVITE**

THESIS

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THESIS/SP 668.4 T43 2017

May 2017

✓ **IN VITRO SCREENING OF LOW-DENSITY POLYETHYLENE -
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Undergraduate Thesis
Submitted to the Faculty of the
Department of Biological Sciences,
College of Arts and Sciences,
Cavite State University,
Indang, Cavite,
Philippines

In partial fulfillment
of the requirements for the degree of
Bachelor of Science in Biology
Major in Microbiology



00011239

*In vitro screening of low-density
polyethylene biodegrading filamentous
668.4 T43 2017
T-6879*

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May 2017

ABSTRACT

TIBAYAN, YVES ROY M. “*In vitro* Screening of Low-density Polyethylene-biodegrading Filamentous Fungi Isolated from Soils in Indang, Cavite”. Undergraduate Thesis. Bachelor of Science in Biology major in Microbiology. Department of Biological Sciences, College of Arts and Sciences, Cavite State University, Indang, Cavite. May 2017. Adviser: Prof. Sherine M. Cruzate.

Low-density polyethylene (LDPE) plastics are substantial wellsprings of pollution as they are recalcitrant and bioinert materials; thus, they are escalating incessantly in the environment. Not only the Philippines, but also the other countries have an immense need to search for efficient and economical approach that would be vastly used to degrade these pollutants.

The present work is on the study of LDPE biodegradation by filamentous fungi obtained from different sampling locations in Indang, Cavite. The isolates were first screened for their biodegrading ability based on abundant growths on Mineral Salt Agar (MSA) amended with LDPE powder. Out of 58 isolates, 28 yielded positive results with abundant growths on MSA after a 30-day incubation. Thereafter, they were subjected to *in vitro* biodegradation assay on Mineral Salt Broth (MSB) containing LDPE plastic strips for 30 days. The 24 filamentous fungal isolates were phenotypically characterized and were identified belonging to four genera, viz. *Aspergillus*, *Penicillium*, *Paecilomyces* and *Helminthosporium*; four were not identified.

The three most promising isolates which exhibited more than 20% biodegradation rates were identified as *Aspergillus niger*, *Paecilomyces* sp. and *Aspergillus niger* with 38.70%, 35.96% and 28.78% rates of biodegradation, correspondingly.

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***IN VITRO* SCREENING OF LOW-DENSITY POLYETHYLENE - BIODEGRADING FILAMENTOUS FUNGI ISOLATED FROM SOILS IN INDANG, CAVITE**

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An undergraduate thesis manuscript submitted to the faculty of the Department of Biological Sciences, College of Arts and Sciences, Cavite State University, Indang, Cavite in partial fulfillment of the requirements for the degree of Bachelor of Science in Biology major in Microbiology with contribution No. CAS-____. Prepared under direct supervision and guidance of Prof. Sherine M. Cruzate.

INTRODUCTION

Plastics are one of the most resource efficient and versatile materials currently available. Total plastics consumption and, consequently, the amount of generated plastic waste have increased continuously during the past few years (Aguado *et al.*, 2006). Nevertheless, one of the major concerns of the present days are the ecological problems related to the environmental pollution by synthetic polymers like plastics; particularly because they are difficult to degrade easily and the entire process is time consuming (Sax, 2010).

Many plastics are both physically and chemically robust and cause waste management problems (Bougoure and Cairney, 2005). However, several families of plastics undergo biodegradation in the environment, and an understanding of how this degradation occurs may aid in the development of strategies to exploit these processes for waste management purposes (Cosgrove *et al.*, 2007).