

UNIVERSITI TEKNOLOGI MARA

**EXPOSURE TO AEROSOLIZED
FUNGI AMONG COLLECTORS OF
RECYCLABLE AND MIXED
RESIDENTIAL WASTE**

NURFATIN KHAIRIAH BINTI ZULKIFLI

Project submitted in fulfillment of the requirements for
the degree of

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(Hons.)**

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DECLARATION BY STUDENT

Project entitled “Exposure to Aerosolized Fungi among Collectors of Recyclable and Mixed Residential Waste” is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor, Dr. Shantakumari Rajan. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

Student’s signature:

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(NurFatin Khairiah Binti Zulkifli)

2013690012

940506-14-6702

Date:

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ABSTRACT

Introduction: Bioaerosols the microbial particulate matter that may contain pathogenic, infectious and toxic live bacteria, fungi and viruses. Fungi are the common bioaerosols and constitute an essential part of the solid waste. Waste collectors have the high risks to the exposure of bioaerosols at their working environment, waste collectors are the one who handling the wastes almost every day for a long period. Various health impacts can resulted from the bioaerosols exposure including allergies, acute toxic effects, respiratory symptoms and cancer. The objectives of this study was to characterize recyclable and mixed residential waste, to quantify the culturable aerosolized fungi that exposed towards waste collectors and to compare them between recycle waste and mixed residential waste collectors. Also to evaluate the influence of outdoor temperature and relative humidity to the concentration of culturable aerosolized fungi. **Methodology:** Residential areas in Kuala Lumpur were selected in this study because the growing of waste generation every year in that city. One sample of each waste was collected and characterized according to their composition at lab. The sampling was done for four days for each waste which were recyclable and mixed residential waste collectors. Aerosolized fungi was sampled using air sampling pump that was attached at the waste collector's body throughout their working hours. The cassette was replaced every 30 minutes with a new one. The colony forming unit of culturable fungi were calculated after it is cultured and incubated for 5-7 days. Outdoor temperature and relative humidity that influence the colony count also were recorded during the sampling process to analyze their relationship. **Result:** The findings obtained from this study shows that throughout the four days, the colony count of aerosolized fungi that exposed towards the waste collectors from mixed residential waste was higher than the recyclable waste and it was not statistically significant where p -value was 0.093 ($p < 0.05$). For correlation between concentrations of aerosolized fungi exposed from recyclable waste with temperature and relative humidity, they have strong relationship where positively correlated for temperature (r : 0.632) but negatively correlated for relative humidity (r : -0.594). For recyclable waste, both of this correlations were statistically significant (p : 0.00). Correlation between the concentration of aerosolized fungi exposed from mixed residential waste also have strong relationship for both temperature (r : 0.819) and relative humidity (r : -0.799) with positive and negative value respectively. These relationships also were statistically significant. **Conclusion:** In conclusion, higher concentration of aerosolized fungi exposed towards the waste collectors was influenced by several factors including the type of waste collected, collection truck, manual handling also total hours of working and handling wastes. Besides that, temperature and relative humidity of the surrounding also were the contributing factors to the high colony count of aerosolized fungi.

Keywords: *Bioaerosols, aerosolized fungi, waste collectors, mixed residential waste, recyclable waste.*