

## **The Identification of Fungal Contaminants in Food Delivery Bag for Food Transportation in Shah Alam**

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### **Structured Abstract**

**Background:** The pandemic has altered consumer behavior from eating out to ordering food online through food delivery platforms and services. However, the process of delivering foods involved poor hygiene and improper food handling practices, resulting in food contamination due to potential fungal growth affected by several factors such as high humidity and temperature. The increasing demand for take-out food comes together with the risks of food contamination due to the insufficiency of handling instructions on take-out food packaging. The spoilage of mold in food contributes to annual global revenue losses while significantly imposing food safety problems such as food borne fungal diseases. The objective of this study was to identify fungal contaminants in food delivery bags, through the isolation of fungal swab samples on potato dextrose agar (PDA).

**Methods:** Fungal growth on the PDA was observed for their morphological characteristics and pH changes in the medium which are associated with the production of acid or alkaline substances due to fungal metabolic activities. Fungal colonies were isolated and grown on skim milk agar (SMA) to observe their abilities of producing enzyme protease, which causes the degradation of the agar, resulting in the presence of a clearing zone.

**Results:** In this study, 7 different species of filamentous fungi were identified based on their morphological characteristics. The potential genus of these fungi includes *Aspergillus*, *Penicillium*, *Trichoderma*, and *Neurospora*. Through the disc diffusion method, it was confirmed that all tested samples exhibited the production of enzyme proteases through the observation of clearing zones on SMA. Furthermore, their metabolic activities were observed and proven to affect the pH of the growth medium as a result of the release of metabolic by-products. Some of the samples exhibited acidic nature as the pH of the medium increased, while some exhibited their basic nature by decreasing the pH.

**Conclusion:** In conclusion, the findings of this study indicated the presence of fungal contaminants in food delivery bags. This study includes valuable data as a baseline for enforcers to assess the adherence to good hygienic practices and proper food handling among food delivery workers.

**Keywords:** Online Food Delivery, Fungal Food Borne Diseases, Filamentous Fungi, Fungal Protease

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