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Morphological and molecular characterization of fungus isolated from tropical bed bugs in Northern Peninsular Malaysia, *Cimex hemipterus* (Hemiptera: Cimicidae)

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ABSTRACT

Objective: To investigate some morphological and molecular characteristics of fungal parasites isolated from wild tropical bed bug, *Cimex hemipterus*.

Methods: A series of culture methods were used to obtain fungal isolates from field-collected bed bugs. Characteristics of the isolates such as colony appearance, mycelial texture and pigmentation were studied to explore their morphology. Isolates were also subjected to a PCR-based genotyping test.

Results: There were noticeable differences in morphological characteristics among the four isolates. Conidial areas of one isolate were dark green, whereas those of the remaining colonies were olive-green, black or dark brown. Conidia of the dark green isolate were globose, while those of olive-green, black and dark brown isolates were globose to subglobose, globose to spherical and globose to subglobose/finely roughened, respectively. These morphological specificities and the molecular analyses showed that the fungal internal transcribed spacer ribosomal region and β -tubulin gene sequences of the isolates shared clade with *Trichoderma* and *Aspergillus* sequences.

Conclusions: Overall, the new discovery of common pathogens in agricultural field developed in live bed bugs storage tank may initiate the use of biological agents in later years.

1. Introduction

Bed bugs are considered to be household insect pests for more than 3300 years back in those early years in ancient Egypt. They have been said to tag along with the colonists in their belongings on the ship and the dispersal occurs in America. However, the indication of bed bugs origin has not been recorded according to the interview done on Louis Sorkin, an insect expert of the American Museum of Natural History[1]. Generally, bed bugs infestation is known to be a nuisance to humans as they have been battling the

insect pests for millennia. As some factors can cause widespread bed bugs population, the number of cases that related to the insect arose drastically in the late 1990s especially in United States[2].

Trichoderma and *Aspergillus* are very cosmopolitan spore-forming genus of fungi. The existence of these genera have been studied and reported as both have the ability to produce some of the most important mycotoxins in the world. Abbot has listed more than 15 types of mycotoxins produced by *Aspergillus* while three mycotoxins were produced by *Trichoderma*[3]. The presence of mycotoxins produced by *Aspergillus* such as aflatoxins, ochratoxins, citrinin and sterigmatocystin can contaminate food commodities and store products such as rice[4,5], barley[6], nuts[7], flour[8] and maize[9]. In insects, the impact or function of *Aspergillus* are varied, from carrier in transmitting microorganism to acting as pathogen to the host. However, reports on the occurrence of this fungi from insect are still limited and rarely reported.

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