

UNIVERSITI TEKNOLOGI MARA

**FURALTADONE,
FURAZOLIDONE AND
NITROFURAZONE
BIOTRANSFORMATION BY
LOCALLY ISOLATED
SOIL FUNGI**

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ABSTRACT

Microbial transformation is defined as a biological process involving modifying or transforming organic compounds by microorganisms. Nitrofurans (NFs) such as furaltadone (FTD), furazolidone (FZD) and nitrofurazone (NFZ) are widely used in veterinary drugs for poultry and aquaculture. Nitrofurans that fed to animal as an antibiotic and growth promoter creates significant toxicity and carcinogenic effects on human health. Other than that, the excretion of chicken faeces which contain these nitrofurans residues into soil cause soil contamination which were then may also enter into water system. Soil fungi as a mycoremediation can be used as an approach to treat soil contamination. There were three main objectives of this research namely, to isolate and identify the potential nitrofurant bioremediation fungi from soil by morphological characteristics and molecular tools; to determine antibacterial activity of the biotransformed residual product and to quantify the biotransformed residual product by High-Performance Liquid Chromatography with diode array detection (HPLC-DAD). Nine species of soil fungi were successfully isolated from chicken poultry. Five were from the *Aspergillus* species namely, *Aspergillus sydowii*, *Aspergillus tamaris*, *Aspergillus candidus*, *Aspergillus versicolor* and *Aspergillus protuberus*. Two of them were from *Penicillium* species, namely, *Penicillium citrinum* (F7) and *Penicillium citrinum* (F13) while the remaining two were *Cephalophora tropica* and *Lichtheimia ramosa*. The five *Aspergillus* species were chosen to determine the best biotransformation activity based on their antibacterial activity. The antibacterial activity of the nitrofurans residues showed that *A. tamaris* have the potential to degrade or transform nitrofurans antibiotics as the nitrofurans residual showed 14 to 29 % reduction in antibacterial activity against selected bacteria. The nitrofurans residual from *A. tamaris* were further quantitatively analysed by using HPLC-DAD using C18 reverse phase column with a mobile phase of acetonitrile and water at 375 nm. After 96 hours of incubation, the furaltadone residues left was 86.73 %. *A. tamaris* also demonstrated a great ability in degrading furazolidone and nitrofurazone whereby the residues left after 96 hours of incubation were 37.49 % and 29.17 %, respectively. Therefore, *A. tamaris* can be applied in treating soil or water environment contaminated with nitrofurant antibiotic.

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