

**Title:** Characterization, Identification, and Cytotoxicity of Fungal volatile organic compounds from The selected strain

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## ABSTRACT

Volatile organic compounds (VOCs) are volatile substances with distinct odor and biological activities. They have been employed in various applications, such as biocontrol, biofungicides, biomarkers, and importantly, as aroma agents for alternative therapeutic approaches. VOCs can be produced by microorganisms—including bacteria, yeasts, and fungi. However, research on fungal VOCs remain limited in Thailand. This study aimed to characterize the volatile organic compounds (VOCs) produced by a fungal strain (NEWI) and evaluate their preliminary cytotoxic effects on cells. The fungal strain was cultured, identified through phylogenetic analysis, and classified. VOCs were then distilled, extracted, purified, and analyzed by GC-MS. Additionally, cytotoxicity was assessed in Vero cells and A549 cells using presto blue cell viability assays. The results demonstrated that the NEWI fungus represents a novel species. Chemical analysis revealed that the major constituents of the crude volatile extract were two novel compounds, designated compound 1 (4-10) and compound 2 (11-14). Moreover, the cytotoxicity of volatile compounds showed that the purified compound 1 (4-10) exhibited cytotoxic effect in both Vero cells and A549 cells, with 50% inhibitory concentration ( $IC_{50}$ ) value with an  $IC_{50}$ = 473.8  $\mu$ g/mL and  $IC_{50}$ = 471.2  $\mu$ g/mL, respectively. In contrast, compound 2 (11-14) demonstrated lower cytotoxicity on Vero cells and A549 cells, with an  $IC_{50}$ =1032  $\mu$ g/mL and 830.8  $\mu$ g/mL, respectively. These results suggest that VOCs from the NEWI strain exhibit bioactivity, with potential applications in future medical and therapeutic development.