INTISARI

AKTIVITAS ANTI *Ganoderma boninense* DAN IDENTIFIKASI SENYAWA ORGANIK VOLATIL DARI KELOMPOK BACILLUS

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Kelompok *Bacillus* diketahui mampu menghasilkan senyawa organik volatil (SOV) yang menghambat berbagai fungi patogen tanaman. Namun demikian, pengujian aktivitas anti *Ganoderma* melalui SOV yang dihasilkan dan identifikasi komponen SOV belum banyak dilakukan. Dalam studi ini, SOV yang diproduksi oleh tujuh isolat *Bacillus*, dievaluasi secara *in vitro* untuk aktivitas anti fungi mereka terhadap *Ganoderma boninense*, dan dilanjutkan analisis komponen SOV dari dua isolat terpilih. Senyawa organik volatil yang dihasilkan oleh tujuh isolat *Bacillus* menghambat pertumbuhan *Ganoderma*. Pemindaian dan transmisi mikroskop elektron menunjukkan adanya kerusakan dan kelainan pada miselium yang terpapar SOV dari 2 isolat *Bacillus*. Analisis mikroekstraksi fase padat/kromatografi gas-spektrometri massa menunjukkan bahwa isolat GMN2 dan BS menghasilkan SOV secara berturut-turut 32 dan 15 jenis. Empat SOV ditemukan pada kedua isolat (*cyclobutanol*, 2-*methyl-Propanoic acid*, 5-*methyl*-2-*Hexanone*, dan *dimethyl disulphide*) telah diketahui sebagai SOV yang memiliki aktivitas anti fungi terhadap patogen tanaman. Hasil dari penelitian ini menunjukkan bahwa secara umum *Bacillus* dapat menghambat pertumbuhan *Ganoderma* melalui produksi SOV. Informasi ini akan meningkatkan pemahaman kita tentang interaksi mikroba yang dimediasi oleh SOV di alam dan membantu pengembangan strategi yang lebih aman untuk mengendalikan *Ganoderma*.

Kata kunci: Senyawa organik volatil (SOV), *Bacillus*, *Ganoderma*, anti fungi, patogen.

ABSTRACT

ANTI *Ganoderma boninense* ACTIVITY AND IDENTIFICATION OF VOLATILE ORGANIC COMPOUNDS FROM BACILLUS GROUP

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The *Bacillus* group is known to produce volatile organic compounds (VOCs) which inhibit various plant pathogenic fungi. However, the testing of anti-*Ganoderma* activities through the resulting VOCs and identification of VOCs components has not been widely carried out. In this study, VOCs, which was produced by the seven *Bacillus* isolates, was evaluated in vitro for their antifungal activity against *Ganoderma boninense* and continued with VOCs component analysis of two selected isolates. Volatile organic compounds produced by the seven *Bacillus* isolates inhibit the growth of *Ganoderma*. Scanning and transmission of electron microscopy showed damage and abnormalities in the mycelium exposed to VOCs from two *Bacillus* isolates. Solid phase microeconomic extraction/gas chromatography-mass spectrometry showed that GMN2 and BS isolates were produced 32 and 15 types of VOCs respectively. The four VOCs were found in both isolates (cyclobutanol, 2-methyl-propanoic acid, 5-methyl-2-Hexanone, and dimethyl disulphide) which are known as VOCs which have antifungal activity against plant pathogens. The results of this study indicate that in general *Bacillus* can be inhibited the growth of *Ganoderma* through VOCs production. This information will enhance our understanding of microbial interactions for *Ganoderma*.

Keywords: Volatile organic compounds (VOCs), *Bacillus*, *Ganoderma*, antifungal, pathogen.