

INTISARI

PENGARUH KOMPOSISI BAKTERIOMA *Aspergillus flavus* TERHADAP KOMPOSISI BAKTERIOMA DAN PRODUKSI SENYAWA AFLATOKSIN

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Interaksi bakteri dan fungi saat ini telah banyak diamati namun penelitian yang mengkaji pengaruh perubahan struktur komunitas bakteri *A. flavus* akibat pemberian antibiotik terhadap perilaku dan aktivitas fungi masih sangat sedikit ditemui. Penelitian ini menggunakan dua jenis antibiotik yaitu ampisilin dan kloramfenikol. Profil komunitas bakterioma dianalisis menggunakan QIIME2 pada teknologi *Next-Generation Sequencing* (NGS) sedangkan pengaruh perubahan komunitas bakteri diamati pada pertumbuhan dan produksi senyawa aflatoksin *A. flavus* melalui media kontrol (K), media perlakuan antibiotik ampisilin (A) dan kloramfenikol (C) serta pada peak kromatogram LC-HRMS.

Hasil penelitian menunjukkan pemberian antibiotik ampisilin dan kloramfenikol menyebabkan pergeseran, penurunan dan peningkatan kelimpahan relatif bakteri. Pada aras genus ketiga isolat didominasi oleh kelompok bakteri berbeda, isolat K didominasi oleh genus *Ralstonia*, isolat A oleh genus *Pseudomonas* dan isolat C oleh genus *Sphingomonas*. Perubahan struktur komunitas bakteri menyebabkan kerapatan spora pada isolat A dan C menurun, laju pertumbuhan hifa meningkat pada isolat C serta produksi senyawa aflatoksin B₁ dan B₂ yang ditemukan paling tinggi pada isolat C dan terendah pada isolat A. Selain itu berdasarkan hasil deteksi LC-HRMS menunjukkan aflatoksin G₁ dan G₂ hanya ditemukan pada isolat C. Sehingga secara keseluruhan penelitian ini dilakukan untuk melihat kemampuan kedua antibiotik tersebut dalam menekan komposisi bakterioma serta pengaruh perubahan komposisi bakterioma terhadap struktur makroskopis, kerapatan spora, eksistensi hifa dan produksi senyawa aflatoksin.

Kata kunci: Aflatoksin, *Aspergillus flavus*, bakterioma, ampisilin, kloramfenikol

ABSTRACT

EFFECT OF *Aspergillus flavus* BACTERIOME COMPOSITION ON MORPHOLOGICAL CHARACTERISTICS AND AFLATOXIN COMPOUND PRODUCTION

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The bacteria-fungi interaction has long been known to exist, but there have been very few studies looking at how changes in the structure of the *A. flavus* bacterial community brought on by antibiotic treatment affect the behavior and activity of fungi. Chloramphenicol and ampicillin were the two kinds of antibiotics employed in this study. Bacteriome community profiles were analyzed by QIIME2 on Next-Generation Sequencing (NGS) technology. The impact of bacterial community changes was observed on the growth of *A. flavus* and production aflatoxin compounds through control medium (K), antibiotic-treated medium ampicillin (A) and chloramphenicol (C), and on LC-HRMS chromatogram peaks.

The result revealed that the relative abundance of bacteria changed, decreased, and increased in response to the administration of the antibiotics ampicillin and chloramphenicol. A distinct bacterial genus dominates each of the three isolates at the genus level: isolate K is dominated by the genus *Ralstonia*, isolate A by the genus *Pseudomonas*, and isolate C by the genus *Sphingomonas*. The spore density in isolates A and C decreased, the rate of hyphal growth in isolate C increased, and the production of aflatoxin B1 and B2 compounds was highest in isolate C and lowest in isolate A due to changes in the composition of the bacterial population. Additionally, aflatoxin G1 and G1 were exclusively discovered in isolate C, according to the findings of LC-HRMS detection. Therefore, this study was conducted to determine the ability of the two antibiotics to suppress the composition of the bacteriome and the effect of changes in bacteriome composition on macroscopic structure, spore density, hyphal existence, and the production of aflatoxin compounds.

Keywords: Aflatoxin, *Aspergillus flavus*, bacteriome, ampicillin, chloramphenicol