

Uji Potensi Antagonis Isolat Ko-kultur *Bacillus siamensis* LDR dan *Stenotrophomonas maltophilia* G17 terhadap Fungi Fitopatogen *Ganoderma boninense* = Antagonistic Potential Assay of Co-culture Isolates of *Bacillus siamensis* LDR and *Stenotrophomonas maltophilia* G17 against the Phytopathogenic Fungus *Ganoderma boninense*

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Abstrak

Sektor kelapa sawit (*Elaeis guineensis* Jacq.) berperan penting dalam perekonomian nasional, tetapi terancam oleh infeksi *Ganoderma boninense* yang menyebabkan penyakit Busuk Pangkal Batang (BPB). Salah satu upaya pengendalian penyebaran fungi fitopatogen yaitu menggunakan bakteri antagonis. Penelitian ini bertujuan untuk menguji potensi antagonis ko-kultur *Bacillus siamensis* LDR dan *Stenotrophomonas maltophilia* G17 terhadap *Ganoderma boninense* melalui uji antagonis dan antibiosis. Uji antagonis dilakukan menggunakan metode dual culture berupa pour plate dan disc delayed culture pada medium. Filtrat ko-kultur yang difermentasi selama 5 dan 7 hari pada Nutrient Broth (NB) dan NB dengan tambahan glukosa digunakan untuk uji antibiosis menggunakan metode agar well diffusion dan pour plate. Uji antagonis maupun uji antibiosis dilakukan pada medium Plate Count Agar (PCA) dan Potato Dextrose Agar (PDA). Potensi antagonis dan antibiosis ko-kultur bakteri terhadap fungi diukur berdasarkan diameter pertumbuhan fungi yang menunjukkan hambatan menggunakan rumus Growth Inhibition Rate (GIR). Hasil uji antagonis menunjukkan hambatan pertumbuhan fungi mencapai $69.63\% \pm 2,46\%$ pada metode disc delayed culture sedangkan pada metode pour plate mencapai 100%. Sementara, filtrat hasil fermentasi ko-kultur bakteri berusia 5 hari dan 7 hari menghasilkan senyawa antifungi yang menghambat pertumbuhan fungi uji dengan GIR mencapai 100% pada metode pour plate dan $48,20\% \pm 2,23\%$ pada metode agar well diffusion. Filtrat hasil fermentasi selama 5 hari menunjukkan performa antibiosis yang lebih baik. Sementara, penambahan glukosa pada proses fermentasi tidak meningkatkan performa antibiosis. Selanjutnya, perlu dilakukan identifikasi senyawa antifungi yang dihasilkan oleh ko-kultur *B. siamensis* LDR dan *S. maltophilia* G17.

.....The oil palm sector (*Elaeis guineensis* Jacq.) plays a crucial role in the national economy but is threatened by *Ganoderma boninense*, causing Basal Stem Rot (BSR). One strategy to control the spread of this phytopathogenic fungus is to employ antagonistic bacteria. This research aims to assess the antagonistic potential of co-cultured *Bacillus siamensis* LDR and *Stenotrophomonas maltophilia* G17 against *G. boninense* through antagonism and antibiosis assays. Antagonism assays were conducted using pour plate and disc delayed culture methods. Fermented co-culture filtrates (5 and 7-day) in Nutrient Broth (NB) and NB supplemented with glucose were utilized for antibiosis assays, using agar well diffusion and pour plate methods. Both assays were conducted on Plate Count Agar (PCA) and Potato Dextrose Agar (PDA) media. Potency of bacterial co-culture against *G. boninense* were evaluated based on the inhibition diameter of fungal growth, calculated using the Growth Inhibition Rate (GIR) formula. The antagonism assay results showed fungal growth inhibition of $69.63\% \pm 2.46\%$ with the disc delayed culture, while the pour plate achieved 100% inhibition. Meanwhile, the filtrate from the 5 and 7-day fermented bacterial co-culture produced antifungal compounds that inhibited fungal growth by 100% using the pour plate and $48.20\% \pm$

2.23% using the agar well diffusion. The 5-day fermented filtrate showed better antibiosis performance. The addition of glucose during the fermentation process did not enhance antibiosis performance. Further identification of antifungal compounds produced by the *B. siamensis* LDR and *S. maltophilia* G17 co-culture is needed.