ABSTRAK

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AKTIVITAS ANTIFUNGAL *Bacillus amyloliquefaciens* D9 DAN *Lactobacillus plantarum* F75 TERHADAP *Aspergillus welwitschiae* DAN *Penicillium* sp.

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xii + 37 halaman: 3 gambar; 1 tabel; 2 lampiran

Jamur merupakan organisme eukariot yang dapat ditemukan dimana saja baik air, udara maupun tanah. Jamur terbagi menjadi tiga jenis, yakni kapang, khamir, dan cendawan. Jamur dapat digunakan menjadi bahan makanan dan bahan obat-obatan. Namun, sebagian jamur terutama kapang dan khamir bersifat merugikan dan menyebabkan pembusukan pada makanan dan buah. Untuk mengatasi pembusukan oleh jamur, diperlukan zat antifungal. Zat antifungal dapat berasal dari ekstrak komponen bakteri. Maka dari itu, penelitian ini bertujuan untuk mengidentifikasi aktivitas dari bakteri *B. amyloliquefaciens* D9 dan *L. plantarum* F75 terhadap *Aspergillus welwitschiae* dan *Penicillium* sp. dengan metode zona inhibisi *whole cell,* serta identifikasi gen antifungal *L. plantarum* F75 guna untuk memperluas penemuan obat antifungal baru. *B. amyloliquefaciens* dikenal mempunyai komponen antifungal yang dihasilkan dari lipopeptida dan komponen volatil berupa myriocin, iturin A, 2-nonanone, dan lainnya. Sedangkan, *L. plantarum* diketahui menghasilkan komponen antifungal yakni siklik dipeptida dan asam organik berupa asam laktat, fenillaktat, asetat, dan formiat. Pada penelitian ini dilakukan uji aktivitas antifungal dengan metode *whole cell* dan identifikasi gen antifungal dari genom *L. plantarum* F75 dengan RAST-PATRIC. Dari penelitian ini diketahui bahwa *B. amyloliquefaciens* D9 dapat menghasilkan komponen antifungal yang dapat menghambat *A. welwitschiae* dan *Penicillium* sp. Sedangkan*, L. plantarum* F75 tidak menunjukkan aktivitas hambatan. Namun, identifikasi gen pada RAST diketahui bahwa *L. plantarum* F75 dapat menghasilkan asam laktat, asam asetat dan asam formiat yang dapat memberikan efek antifungal.

Kata Kunci : *Bacillus amyloliquefaciens* D9, *Lactobacillus plantarum* F75, bakteri, *Aspergilus welwitschiae, Penicillium* sp.*,* fungi, antifungal, zona inhibisi, anotasi genom

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ABSTRACT

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ANTIFUNGAL ACTIVITY OF *Bacillus amyloliquefaciens* D9 AND *Lactobacillus plantarum* F75 AGAINST *Aspergillus welwitschiae* AND *Penicillium* sp.

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Fungi are eukaryotic organisms that can be found everywhere, including in air and soil. Fungi are divided into three types, namely molds, yeasts and mushrooms. Fungi are commonly used as food and medicine. However, some fungi, especially molds and yeasts, can cause spoilage in food and fruit. To treat spoilage caused by fungi, antifungal substances are needed. Antifungal substances can be derived from extracts of bacterial components. Therefore, this study aims to identify the activity of *B. amyloliquefaciens* D9 and *L. plantarum* F75 bacteria against *Aspergillus welwitschiae* and *Penicillium* sp., as well as to identify antifungal genes of *L. plantarum* F75. *B. amyloliquefaciens* is known to have antifungal components produced from lipopeptides and volatile components in the form of myriocin, iturin A, 2-nonanone and others. Meanwhile, *L. plantarum* is known to produce antifungal components, namely cyclic dipeptides and organic acids in the form of lactic, phenyllactic, acetic, and formic acids. In this study, the potential antifungal activity of *B. amyloliquefaciens* D9 and *L. plantarum* F75 were tested using the whole cell method. Subsequently, identification of antifungal genes from the *L. plantarum* F75 genome was conducted using the RAST-PATRIC, due to the availability of whole-genome data of this isolate. We observed that while *B. amyloliquefaciens* D9 could produce antifungal components, *L. plantarum* F75 did not show any inhibitory activity. However, identification of genes in RAST revealed that *L. plantarum* F75 has potential antifungal compounds in the form of lactic acid, acetic acid and formic acid.

Keywords : *Bacillus amyloliquefaciens* D9, *Lactobacillus plantarum* F75,bacteria, *Aspergilus welwitschiae, Penicillium* sp*.,* fungi, antifungal, inhibition zone, genome annotation

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