

## ABSTRAK

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### **ANALISIS RESITENSI ANTIBIOTIK DARI *Bacillus subtilis* IFP1.1. DAN *Bacillus amyloliquefaciens* N1**

Skripsi, Fakultas Sains dan Teknologi (2021).

(xiv + 62 halaman; 5 gambar; 4 tabel; 34 lampiran)

Resistensi antibiotik telah menjadi ancaman bagi masyarakat global karena kemampuan bakteri patogen bertahan terhadap paparan antibiotik. Ancaman ini dapat muncul karena penggunaan dosis antibiotik yang tidak tepat pada makanan hewan dan disebarkan melalui pasokan makanan. Bakteri komensal yang ditemukan pada hewan ternak dapat berperan sebagai perantara penyebaran resistensi kepada manusia. Perlu diketahui bahwa *Bacillus* spp. dijual secara komersial sebagai suplemen probiotik bagi manusia dan hewan. Tujuan penelitian ini adalah untuk mengetahui fenotip dan genotip resistensi dari isolat *Bacillus* spp. Sehingga, dilakukan uji resistensi terhadap 23 jenis antibiotik melalui metode *disc diffusion*. Kedua strain resisten terhadap *ampicillin*, *amoxicillin*, *methicillin*, *oxacillin*, *streptomycin*, *tetracycline*, *lincomycin* dan *rifampicin*. Melalui analisis bioinformatika, ditemukan adanya gen yang memberikan sifat resistensi terhadap antibiotik tersebut. Pada isolat *Bacillus subtilis* IFP1.1 ditemukan ada gen resistensi terhadap *chloramphenicol*, yaitu *catB3* dan *tetracycline*, yaitu *tet(A)*. Pencarian BLAST terhadap *sequence* DNA kedua gen menunjukkan lokasi gen pada plasmid. Dengan demikian, dibutuhkan penelitian lebih lanjut untuk melakukan ekstraksi dan *sequencing* dari plasmid yang terdapat pada *Bacillus subtilis* IFP1.1.

Kata Kunci : Resistensi antibiotik, probiotik, *Bacillus* spp., gen resistensi, plasmid.

Referensi : 110 (1983-2021)

## ABSTRACT

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### **ANTIBIOTICS RESISTANCE ANALYSIS OF *Bacillus subtilis* IFP1.1 AND *Bacillus amyloliquefaciens* N1**

Thesis, Faculty of Science and Technology (2021)

(xiv + 62 pages; 5 figures; 4 tables; 34 appendices)

Antibiotic resistance has become a threat to the global community due to the ability of pathogenic bacteria to withstand antibiotic exposure. The antibiotic resistance crisis arises mainly due to the inappropriate use of antibiotic doses in animal foods, which could spread through the food supply. Commensal bacteria found in farm animals can act as an intermediary to spread antibiotics resistance to humans. *Bacillus* spp. are used in commercial production as a probiotic supplement for humans and animals. The purpose of this study was to discover the phenotype and genotype resistance of *Bacillus* spp. isolates. Antibiotic susceptibility test for 23 antibiotics were determined for *B. subtilis* IFP1.1 and *B. amyloliquefaciens* N1 by disc diffusion method. Both strains exhibited resistance against ampicillin, amoxicillin, methicillin, oxacillin, streptomycin, tetracycline, lincomycin and rifampicin. Bioinformatics analysis revealed that several genes were responsible for the resistance properties towards these antibiotics. In *B. subtilis* IFP1.1 isolate, resistance genes to chloramphenicol, catB3, and tetracycline, tet(A) were found. BLAST search on DNA sequences of both genes indicated that their location were in the plasmid. In conclusion, we demonstrated antibiotic resistance phenotype and genotype of *B. subtilis* IFP1.1. and *B. amyloliquefaciens* N1. Further research would be required to perform extraction and sequencing of this plasmid found in *B. subtilis* IFP1.1.

**Keywords** : Antibiotic resistance, probiotics, *Bacillus* spp., resistance genes, plasmid.

**Reference** : 110 (1983-2021)