

ABSTRACT

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GENOTYPING ANTIBIOTIC RESISTANCE PATTERNS IN *Pediococcus pentosaceus* ISOLATES

Thesis, Faculty of Science and Technology (2020).

(xiii + 24 pages; 5 figures; 3 tables; 3 appendices)

Probiotics are recognized as an important supplement in the process of rearing livestock, including pigs, as they can improve production, quality, and mitigate illness. In a previous study, two *Pediococcus pentosaceus* isolates were isolated and studied for their potential as probiotics, including the phenotypic determination of antibiotic resistance profiles. A discrepancy in the phenotypes was detected, despite the isolates having been obtained from the same host: isolate H29 showed lincomycin resistance, while isolate D32 was sensitive to lincomycin. The purpose of this study is to explain the genotypic basis of this discrepancy using whole-genome sequencing of these *P. pentosaceus* isolates. Genomic DNA was isolated from these and whole-genome sequencing was carried out. Following assembly and annotation, it was found that H29 harbored *lnuA*, a resistance gene to lincomycin. This *lnuA* gene had also been detected in the whole-genome sequences of several lactobacilli, and bore 99.7% resemblance to that from *Staphylococcus chromogenes*. In-silico analysis of the genomic sequence of H29 predicted a plasmid similar to the plasmid pR18 isolated from *Lactobacillus plantarum* strain PA18. BLAST search of plasmid pR18 against the H29 genome showed 99.97% similarity and coverage. This strongly indicates that *P. pentosaceus* isolate H29 harbors a plasmid encoding the *lnuA* gene which confers lincomycin resistance. This plasmid was likely transferred from other lactic acid bacteria although the gene originated from staphylococci. Further study is needed to precisely characterize this plasmid and the genetic basis of other resistance phenotypes observed in these isolates.

Keywords : Antibiotic resistance, genotyping, probiotics

Reference : 68 (1966-2020)