ABSTRACT

Streptococcus pneumoniae is a leading cause of lower respiratory infection in the world. When *S. pneumoniae* colonizes in the host nasopharynx, *S. pneumoniae* must compete with other microbial members to access the nutrients for survival by secreting small peptide bacteriocins called pneumocin. The quorum sensing of BlpC must occur in the extracellular membrane to stimulate the production of pneumocin. In this project, Polymerase Chain Reaction (PCR), genome sequencing, and bacteriocin assay were conducted to screen and analyze the presence and variability of *blpC* gene among vaccine serotypes and non-vaccine serotypes, and bacteriocin-like activity toward non-invasive serotypes. The result of PCR and gel electrophoresis showed the presence of *blpC* gene in all isolates used, except one isolate serotype 19F. There was no association between *blpC* gene and the serotype coverage in the pneumococcal vaccine($p>0.05$). Bacteriocin assay's optimization showed, *Streptococcus pneumoniae* has bacteriocin-like activity within its serotypes but not toward closely related bacteria – *Streptococcus mitis* and *Streptococcus agalactiae.* Other methods, such as mutant construction and molecular testing are also needed to detect the presence of genes associated with bacteriocin resistance.

Keywords: Pneumocin, *Streptococcus pneumoniae*, Bacteriocin Assay, *blpC* gene, quorum sensing