ABSTRACT

Resistant bacteria appear as one of the biggest problems in the medical world. Antibiotic abuse in humans, agriculture and livestock contributes to this phenomenon. S. aureus and K. pneumoniae are the main sources of nosocomial infections. Both bacteria have various mechanism to inhibit the mechanism of antimicrobial agents. Active components in ancient medicine can be used as alternative, preventive and adjuvant therapies to these infections. Propolis in this study is a resin product by *Apis melifera* bees. Propolis has antimicrobial properties caused by interaction of phenols, flavonoid and other aromatic compounds. This potential compound can be tested for its synergistic ability with commercial antibiotics.

This research is an experimental study with a posttest only control group research design. The subject of this study was S. aureus and K. pneumoniae bacteria. The study was conducted in two stages, namely the antibacterial test of propolis extract with agar dilution method and antibiotic synergism test with propolis extract through Kirby-Bauer diffusion disc method. Stage 1 was divided into 8 treatment groups S.aureus + EEP 40%, S.aureus + WEP 40%, K. Pneumoniae + EEP 40%, and K. Pneumoniae + WEP 40% and negative and positive controls. The results show that 40% EEP is bactericidal against both bacteria, while WEP is 40% bactericidal only in K. pneumoniae. 40% WEP is bacteriostatic against S. aureus.

Stage 2 is divided into 21 plates for each bacterium. Antibiotics tested include: Ampicillin, Amoxicillin - Clavulanic acid, Chloramphenicol, Ciprofloxacin, Gentamicin, and Tetracycline. Antibiotics are combined with EEP 40% or WEP 40% and seen the synergy with the bacteria *S. aureus* and *K. pneumoniae*. The data obtained is then analyzed statistically. 40% EEP administration of antibiotics showed antagonistic results. EEP40% reduces the inhibitory zone of the antibiotic in bacteria. As an exception, the 40% EEP is synergistic with Ampicillin against *K. pneumoniae*. Giving WEP 40% shows varied results. 5 of the 12 WEP groups of 40% showed synergism that expanded the inhibitory zone in the bacteria *S.aureus* and *K. pneumoniae.* WEP 40% is synergistic with amoxicillin – clavulanic acid and gentamicin toward S. aureus meanwhile ampicillin , chloramphenicol, and ciprofloxacin towards *K. pneumoniae.*

Therefore, it is recommended that further research be conducted in vivo to see the performance of a 40% WEP combination with various types of antibiotics. The research can see the performance that is influenced by the physiology of the body of the mammals.