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Evaluation of *In-vitro* Synergistic Antibacterial Effects between *Munronia pinnata* (Bin Kohomba) Found in Sri Lanka and Commercially Available Antibiotics against Urinary Tract Infection Causing Pathogens

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Antibiotics are used to treat urinary tract infections (UTI) but their misuse and overuse lead to antibiotic resistance. Herbal plants which consist of complex chemical structures and diverse secondary metabolites can potentially reduce antibiotic resistance. In this study, synergistic antibacterial activity of aqueous extract of the whole plant of *Munronia pinnata* was evaluated with commercially available antibiotics. Antibacterial effect was performed against *Escherichia coli* (ATCC 25922), *Staphylococcus aureus* (ATCC 25923), *Pseudomonas aeruginosa* (ATCC 27853), *Klebsiella pneumoniae* (Medical Research Institute (MRI) Control), Multi Drug Resistant (MDR) Coliforms and MDR *Pseudomonas*. Gentamicin was used as a positive control. The synergistic effect between M. pinnata extraction and antibiotics (Gentamicin, Ciprofloxacin, Norfloxacin, Co- amoxiclav) was assessed using both disk and well diffusion methods. The experiment was done in triplicates and the diameter of the inhibition zone was measured and recorded. The highest antibacterial activity was shown by *M. pinnata* with an inhibition zone diameter of 15.67 ±2.89 mm against *S. aureus*. Most synergistic interaction was shown by *M. pinnata* for Norfloxacin against *P. aeruginosa*. Additive effect of *M. pinnata* was shown in combination with Co-amoxiclav. Therefore, the results showed that aqueous whole plant extract of *M. pinnata* has synergistic interactions, additive effects and in vitro antibacterial activity against *S. aureus*. Further studies are required to determine the mechanism and active compounds responsible for the antibacterial properties, synergistic and additive effects of *M. pinnata* whole plant.

Keywords: *munronia pinnata (Bin Kohomba), urinary tract infection, synergistic effect*