Abstract No:BO-19

Preliminary studies of antibacterial and antifungal activities of Paspanguwa

P. A. S. N. P. Jayawardena[1] and C. C. Kadigamuwa[1*]

[1] Department of Chemistry, Faculty of Science, University of Kelaniya, Sri Lanka
cckadigamuwa@kln.ac.lk*

Paspanguwa appears to be a traditional Sri Lankan home treatment that has been used for hundreds of years to treat common ailments. The name 'Paspanguwa' term from a combination of five primary herbs ('pas' = five, 'panguwa' = parts): ginger (*Zingiber officinale*), pathpadagam (*Hedyotis corymbosa*), katuwalbatu (*Solanum xanthocarpum*), venivalgata (*Coscinium fenestratum*), and coriander (*Coriandrum sativum*). This study focused on evaluating the antibacterial and antifungal activities of aqueous extracts from dried herbal constituents in Paspanguwa separately and the Paspanguwa mixture on the growth of *Staphylococcus aureus* (ATCC 25923), *Escherichia coli* (ATCC 25922),and *Klebsiella pneumoniae* (DSM 16358), bacterial strains and *Candida albicans* (ATCC 10231) fungal strain using agar disc diffusion method and also to investigate antifungal activity of Paspanguwa mixture against *Aspergillus welwitschiae* using agar disc diffusion and spore germination inhibition analysis method. Decoctions of each dried herbal constituent contained in Paspanguwa and their mixture was obtained. To investigate antibacterial and antifungal activities, Nutrient Agar and Potato Dextrose Agar (PDA) media were utilized respectively. Optical density at 600 nm of *S. aureus*, *E. coli*, and *K. pneumoniae* bacterial suspensions was adjusted to 0.4, 0.4, and 0.2 values accordingly and for *C. albicans*, *A. welwitschiae* fungal suspensions at 0.4, 0.18 correspondingly. Discs impregnated in distilled water were used as a negative control and amoxicillin (0.002g/mL, 0.001g/mL, and 0.0016g/mL) as positive controls for *S. aureus*, *E. coli* and *K. pneumoniae* strains, respectively. Carbendazim (0.004 g/mL) was utilized as a positive control against fungal strains. According to the results, aqueous extracts derived from coriander (*Coriandrum sativum*) (0.7 ± 0.1 cm) and Pasapanguwa mixture (0.7± 0.0 cm) have shown antibacterial potentials only against the *S. aureus* bacterial strain. Results were obtained for the antifungal effect of herbal extracts on *C. albicans* and *A. welwitschiae* fungal strains. Only antifungal activities were achieved against *C. albicans* in the extractions of ginger (*Zingiber officinale*) (0.8 ± 0.1 cm) and Pasapanguwa mixture (0.7± 0.1 cm). However, no positive results were found for *A. welwitschiae* and these results were further proven by the spore germination inhibition analysis technique. In this technique, PDA, and spore suspension were placed on top of the sterile microscopic slides as the first and second layers, respectively. One slide set was prepared by placing distilled water as a negative control on top of the above-mentioned two layers (as the third layer) and another set was prepared by placing a Pasapanguwa mixture instead of distilled water. According to the results observed from the phase-contrast microscope, fungal spores (conidia = asexual spores) in both sets were germinated. Finally, it can be concluded that Paspanguwa water extract has antibacterial and antifungal activity against some strains, but its activity is insufficient to compare with other well-known antibacterial and antifungal drugs.

Keywords: Agar disk diffusion**,** Antibacterial activity, Antifungal activity, Paspanguwa, Spore germination inhibition