

## ***Paspanguwa* herbal remedy potentiates antibacterial efficacy of Penicillin against Methicillin-resistant *Staphylococcus aureus***

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*Paspanguwa* is a traditional Sri Lankan polyherbal remedy for fever, cold, cough, headache, and body aches. With global antibacterial resistance on the rise, penicillin has lost effectiveness against many infections. Thus, this study aimed to investigate how different commercially available *Paspanguwa* formulae interact with penicillin and to identify the specific plant species within these formulae that influence this interaction. Five *Paspanguwa* formulae were purchased. Individual dried plant parts used in *Paspanguwa* were sourced from the Ayurvedic Drug Corporation of Sri Lanka. The *Paspanguwa* formulae were prepared as per package instructions. Dried plant materials (25 g each) were boiled in 200 mL of distilled water (DW) for 20 minutes and filtered. Agar well diffusion assay was employed to test antibacterial activity against methicillin-resistant *Staphylococcus aureus* (MRSA). The wells were dispensed with: 50  $\mu$ L of 3.0 mg/mL penicillin solution (positive control), a mix of 25  $\mu$ L of 3.0 mg/mL penicillin solution, 25  $\mu$ L plant extract, 50  $\mu$ L of 1.5 mg/mL penicillin (experimental control), and 50  $\mu$ L of DW (negative control). Inhibition zone diameters (IZDs) were measured. The data were analyzed using one-way ANOVA with Dunnett's post-hoc test, considering  $P < 0.05$  statistically significant. All five *Paspanguwa* formulae showed zero IZD, yet significantly enhanced the zone of inhibition achieved by penicillin alone ( $9.65 \pm 0.24$  mm). Aqueous seed extracts of *Coriandrum sativum* (CSE;  $13.64 \pm 0.78$  mm) and *Piper nigrum* (PNE;  $13.07 \pm 0.18$  mm), ingredients in *Paspanguwa*, significantly enhanced the IZD of penicillin ( $8.55 \pm 0.30$  mm). However, the aqueous crude extracts alone did not inhibit MRSA growth. The minimum inhibitory concentration (MIC) of penicillin, penicillin with CSE, and penicillin with PNE were 17.58, 4.17, and 9.88  $\mu$ g/mL, respectively. Thus, the extracts of CSE and PNE enhanced penicillin's antibacterial activity by 4.2 and 1.8 times, respectively. In conclusion, the *Paspanguwa* formulations significantly enhanced the antibacterial potential of penicillin against MRSA, with CSE being the ingredient responsible for the observed potentiation interaction.

**Keywords:** Antibacterial potentiation, *Paspanguwa*, Penicillin

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