

## ***In-vitro* Antibacterial Activity of *Punica granatum* Bark used as Ayurvedic Medicine in Sri Lanka**

SGC Sanchethana<sup>1#</sup>, HMUAK Herath<sup>1</sup>, RMRA Shantha<sup>1</sup>, MNF Hasaana<sup>1</sup>,  
DDM Jayasuriya<sup>1</sup>, AWMKK Bandara<sup>2</sup>, and DUP Sedara<sup>1</sup>

<sup>1</sup>Faculty of Health Sciences, KAATSU International University, Battaramulla, Sri Lanka

<sup>2</sup>Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University,  
Ratmalana, Sri Lanka

#chamodhi.sanchethana@gmail.com

### **Abstract**

The *Punica granatum* (Delum), which is utilized in Ayurvedic medicine, is one such widely used medicinal plant. Several parts of this plant have been used to treat several illnesses and Delum bark has been shown to contain several bioactive compounds like flavonoids and tannins. Also, its therapeutic potential for antibacterial effect has not been extensively investigated in Sri Lanka. The objective of this study was to determine the antibacterial activity of the aqueous extract of the bark of *Punica granatum* which was safe and non-toxic for skin against *Staphylococcus aureus* and *Pseudomonas aeruginosa* in vitro which were common causes of skin infections. The decoction method was used which can effectively extract water-soluble active compounds. The antibacterial activity of the aqueous extract against *Staphylococcus aureus* (ATCC 25923) and *Pseudomonas aeruginosa* (ATCC 27853) was tested using the agar well diffusion and broth macrodilution methods according to the CLSI guidelines which facilitate comparative analysis. Both assays were triplicated. Results revealed that the mean highest zone of inhibition for 200mg/ml was observed in *Staphylococcus aureus* ( $22.33 \pm 0.58$  mm) and *Pseudomonas aeruginosa* ( $17.62 \pm 0.58$  mm). Minimum inhibitory concentrations were obtained in *Staphylococcus aureus* ( $133.33 \pm 57.74$  mg/ml) and *Pseudomonas aeruginosa* ( $166.67 \pm 57.74$  mg/ml) after overnight incubation. Gentamicin (10 µg/ml) was used as the positive control for both bacteria. This study concludes that aqueous extracts of *Punica granatum* bark possess antibacterial activity against *Staphylococcus aureus* and *Pseudomonas aeruginosa* and suggests that Delum bark could be utilized to treat and develop novel antibacterial formulations against *Staphylococcus aureus* and *Pseudomonas aeruginosa* associated skin infections.

**Keywords:** *Aqueous extract, Punica granatum, Bark, Antibacterial activity, Skin infections*