

## EVALUATION OF THE ANTIBACTERIAL ACTIVITY OF AQUEOUS EXTRACTS OBTAINED FROM THE LEAVES AND BARK OF *PUNICA GRANATUM*

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Plants are a natural source of novel antimicrobials. Fifty percent of new drugs are derived from plants, as plants contain phytochemicals that have antimicrobial activity. As many plants have not yet been investigated for antimicrobial activity, it is a good source for discovering novel antibiotics. In Ayurveda practices, plants are used in the treatment of wounds and infections. *Punica granatum* (*Delum*) has been used in herbal medicine for ages. However, the medical benefits of these plants have been discussed in only a few publications. The plant is documented to possess beneficial effects for eye infections, heart diseases, dysentery, coughs, oedema, worms' diseases, asthma, skin diseases, fever, etc. This study aimed to evaluate the antimicrobial activity of aqueous extracts of the leaves and bark of the *Punica granatum* plant against *Staphylococcus aureus* and *Pseudomonas aeruginosa*. *Staphylococcus aureus* and *Pseudomonas aeruginosa* were obtained from the biomedical laboratory of Kaatsu International University. Plant materials were collected from the Colombo district, and authentication has been obtained from the botany division of the Bandaranayake Memorial Ayurvedic Research Institute, Nawinna, Maharagama, Sri Lanka. Extractions of plants were obtained by the decoction method, and a series of concentrations were prepared. The antibacterial activity of the extracts of the leaves and bark of delum against *Staphylococcus aureus* (ATCC 25923) and *Pseudomonas aeruginosa* (ATCC 27853) was measured using the agar-well diffusion method. Gentamicin (10 µg/ml) was used as the positive control. Each assay was done in triplicate. Aqueous extract of leaves showed the highest antimicrobial activity with inhibition zones of 28.00 ±1.00 mm (*Staphylococcus aureus*) and 21.0 and 0±1.00 mm (*Pseudomonas aeruginosa*), while bark extract (aqueous) showed 22.33±0.58 mm and 17.67±0.58mm of inhibition zones against *Staphylococcus aureus* and *Pseudomonas aeruginosa*, respectively. Both *Punica granatum* leaf and bark aqueous extracts possess antibacterial properties. Following testing on various clinical isolates, the extracts demonstrate potential for the development of antibacterial formulations targeting *Staphylococcus aureus* and *Pseudomonas aeruginosa*.

**Keywords:** aqueous extract, *Punica granatum*, leaves, bark, antibacterial activity