

## ***In-vitro* Antimicrobial Activity of *Cinnamomum cassia* against Pathogenic *Staphylococcus aureus***

Hettiarachchi S.S.M.<sup>1#</sup>, Munasinghe M.I.U.J.<sup>1</sup>, Dassanayake A.D.M.C.P.<sup>1</sup>,  
Wickramaarachchi M.K.I.<sup>1</sup>, Marasinghe M.M.R.P.<sup>1</sup>, Uluwaduge I.<sup>2</sup>

<sup>1</sup>Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka

<sup>2</sup>Department of Biochemistry and Clinical Chemistry, Faculty of Medicine, University of Moratuwa, Sri Lanka

#Corresponding author: shelani@kiu.ac.lk

**Background:** *Cinnamomum cassia* (Davul kurundu) is a commonly used plant in Ayurvedic medicine in Sri Lanka, for the treatment of many diseases. However, the therapeutic potential for treating bacterial and fungal infections has not been scientifically proven.

**Objective:** To determine the antibacterial activity of the methanol extracts of *Cinnamomum cassia* leaves and bark against pathogenic *Staphylococcus aureus* (ATCC25923)

**Methods:** Agar well diffusion assay was used in the study against *S. aureus*. The selected plant was authenticated from the Botany Division, Bandaranayake Memorial Ayurvedic Research Institute, Nawinna, Maharagama (Acc No 4602). Plant extractions were prepared by using methanol in maceration method into the 1:3 ratio. Each extract's mean zone of inhibition (ZOI) was determined after incubating the agar plates for 24 hours at 37 °C. The potency of each extract was validated against positive control gentamicin (10µg/mL) and negative control dimethyl sulfoxide (50%). Then Minimum Inhibitory concentration (MIC) was determined by macro broth dilution method and Minimum Bactericidal concentration (MBC) was determined by subculturing on blood agar.

**Results:** The mean(±SD) ZOI of the concentrations 500mg/mL, 250mg/mL, and 125mg/mL of *C. cassia* bark extract were measured as 24.15(±0.15) mm, 20.5(±0.20) mm, 18.35(±0.35) mm, respectively. The mean ZOI with the concentrations of 500mg/mL, 250mg/mL, and 125mg/mL of *C. cassia* leaf extract were measured as 21.5(±0.50) mm, 18.15(±0.15) mm, 16.35(±0.35) mm, respectively. Mean ZOI of the positive control was 29.01(±1.18) mm. MIC values of *C. cassia* bark extract and *C. cassia* leaf extract were 7.81mg/mL and 62.5mg/mL. MBC values of *C. cassia* bark extract and *C. cassia* leaf extract were 15.63mg/mL and 125mg/mL.

**Conclusions:** The study showed that the methanol extracts of *C. cassia* leaves and bark can be used to treat *S. aureus* infections. Out of the two extracts, *C. cassia* bark extract showed the highest ZOI and lowest MIC and MBC values. Therefore *C. cassia* bark extract can be recommended as an effective antibacterial agent against *S. aureus*.

**Keywords:** Antibacterial, *Cinnamomum cassia*, Minimum inhibitory concentration, *Staphylococcus aureus*, Zone of inhibition