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## IN-VITRO ANTI-DENGUE VIRAL ACTIVITY OF *AEGLE MARMELLOS* (BAEL) DRIED FLOWER AQUEOUS EXTRACT

K.G. Jayasekara\*<sup>1</sup>, S.S.S.B.D.P. Soysa<sup>2</sup>, T.S. Suresh<sup>3</sup>, C.L. Goonasekara<sup>4</sup>,  
K.M. Gunasekera<sup>5</sup>

1 Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka

2 Department of Biochemistry and Molecular Biology, Faculty of Medicine, University of Colombo, Sri Lanka

3 Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka

4 Department of Pre-Clinical Sciences, Faculty of Medicine, General Sir John Kotelawala Defence University, Sri Lanka

5 Department of Microbiology, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka

\*Corresponding author: jayasekarakalani@yahoo.com

### **Abstract**

#### **INTRODUCTION AND OBJECTIVES**

Dengue is an arboviral disease of global concern. No specific anti-dengue viral agent exists. We investigated the in-vitro anti-dengue viral activity of *Aegle marmelos* (AM; Common name: Bael) dried flowers, which is used as a fever remedy in traditional medicine. Method:

Cytotoxicity of AM for Vero cells was tested using 4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) to identify the maximum non-toxic dose (MNTD) and the 50% cytotoxic concentration ( $CC_{50}$ ) at 37°C in 5% carbon dioxide. Chloroquine diphosphate (CQ) was used as the control drug.

Plaque reduction assay for quantifying infectious viral particles was used to determine the half-maximum inhibitory concentration ( $IC_{50}$ ). Vero cells were infected using dengue virus types 1 (DV1), 2 (DV2), 3 (DV3) and 4 (DV4) and treated with AM extracts at concentrations of 2.08-33.32 µg/ml. Dose-response curve was plotted using GraphPad Prism (9.0.0) software. Selectivity Index (SI) was calculated as the ratio of  $CC_{50}/IC_{50}$ .

#### **RESULTS**

MNTD and  $CC_{50}$  of AM were 33.32 µg/ml and 455.0 (CI 371.8- 564.8) µg/ml respectively.  $IC_{50}$  values of AM for dengue serotypes were, DV1 30.16 (CI 24.97-39.08) µg/ml, DV2 8.64 (CI 6.99-10.72) µg/ml, DV3 36.60 (CI 31.93-44.42) µg/ml and DV4 9.36 (CI 6.94-12.81) µg/ml respectively. SI values were DV1 15.09, DV2 52.67, DV3 12.43 and DV4 48.59.

MNTD and  $CC_{50}$  of CQ was 10 µg/ml and 17.03 (CI 15.74-18.36) µg/ml respectively, while  $IC_{50}$  values were DV1 2.48 (CI 2.20-2.80) µg/ml, DV2 7.98 (CI 6.11-11.74) µg/ml, DV3 2.41 (CI 2.11-2.74) µg/ml. CQ did not inhibit DV4. SI values of CQ were DV1 6.86, DV2 2.13, DV3 7.06.

## CONCLUSIONS AND RECOMMENDATIONS

*A. marmelos* dried flower aqueous extract inhibited all four dengue viruses *in vitro* displaying moderate cytotoxicity to Vero cells. Inhibitory activity was serotype dependant. DV2 and DV4 IC<sub>50</sub> values indicated good inhibitory activity (<10 µg/ml) and DV1 and DV3 demonstrated moderate inhibitory activity (10-50 µg/ml). Compared to chloroquine, SI values for all four dengue serotypes were higher and were >10, indicating that this plant extract should be investigated further to identify biologically active compounds with good anti-dengue viral activity.

**Keywords:** *Dengue, Aegle marmelos, Vero Cells, Half-maximum Inhibitory Concentration, Selectivity Index*