



106/A

Phyllanthus debilis Klein ex Willd root extract induces apoptosis mediated cell death in cultured rhabdomyosarcoma cells

B D Perera^{1*}, P Soysa¹ and S Wijerathne²

¹Department of Biochemistry and Molecular Biology, ² Department of Obstetrics and Gynaecology, Faculty of Medicine, University of Colombo, Colombo 08

Cancer is a leading disease in the world. *Phyllanthus debilis* Klein ex Willd (Elapitawakka) has many medicinal values. The present investigation evaluated the cytotoxic effect of roots of *P. debilis* plant against rhabdomyosarcoma (RD) cells.

Roots of the matured plants were refluxed with deionized water and lyophilized. Root extract at different concentrations was exposed to RD cells for 24 hours. The protein content and reduced glutathione (GSH) levels in the cell lysate were determined to evaluate the dose dependent cytotoxicity and cellular antioxidant level, respectively. Caspase 3 and DNA fragmentation assays were carried out to evaluate the mechanism of induction of apoptosis and cell death pathway. Negative control in the absence of the extract and cycloheximide as the positive control were used simultaneously.

Protein content decreased reciprocally with the concentration and the EC_{50} value was $392.5 \pm 13.9 \mu\text{g/mL}$ (n=3). Decrease in GSH levels (0-1000 $\mu\text{g/mL}$) and increase in Caspase 3 activity (0- 1000 $\mu\text{g/mL}$) was observed in a concentration dependent manner. DNA ladder pattern of the fragmented nuclei characteristic of apoptosis was detected at concentrations > 200 $\mu\text{g/mL}$. The results indicate a moderate cytotoxicity on RD cells by the plant extract. Reduced cellular antioxidant potential caused by depletion of GSH can be proposed as the possible mechanism to induce caspase 3 activity leading to DNA fragmentation and cell death.

Keywords: Cytotoxicity, apoptosis, DNA fragmentation, caspase 3, glutathione (GSH)

Acknowledgement: Financial assistance by the University of Colombo Research Grant AP/3/2/2014/RG11