

## **Glutathione S –Transferase enzyme inhibitory activity of Ceylon cinnamon (*Cinnamomum zeylanicum* Blume)**

**W.P.K.M Abeysekera<sup>1</sup>, G.A.S Premakumara<sup>1</sup> and W.D Ratnasooriya<sup>2</sup>**

<sup>1</sup>Herbal Technology Section (HTS), Industrial Technology Institute (ITI), Sri Lanka

<sup>2</sup>Department of Zoology, University of Colombo, Sri Lanka

Glutathione S-transferases (GSTs) are multifunctional detoxification enzymes that protect the cell from electrophilic compounds. Over expression of GSTs in cancer results in resistance to chemotherapeutic agents and inhibition of the over expressed GST has been suggested as an approach to combat GST-induced resistance. It is now well established that natural products including spices can affect or modulate drug-metabolizing enzymes including GSTs. Ceylon cinnamon (CC) (*Cinnamomum zeylanicum* Blume) known as ‘true cinnamon’ in the world is used as a spice in Sri Lanka for centuries. Although many biological activities have been reported worldwide, no studies have been reported on the glutathione S –transferase enzyme inhibitory activity of CC to date. Therefore, present study evaluates the GST inhibitory activity of bark and leaf extracts of authenticated CC *in vitro*.

Freeze dried ethanolic and dichloromethane: methanol (DCM:M) bark and leaf extracts of CC were used in this study. GST enzyme inhibitory activity was carried out according to the method described by Habig *et al.*, (1974) with some modifications (ethanolic and DCM:M bark and leaf extracts, n = 6). Both bark and leaf of Ceylon cinnamon showed dose dependent and significant GST inhibitory activity ( $p < 0.05$ ). However, bark extracts had significantly high GST inhibitory activity compared to leaf extracts: The IC<sub>50</sub> values for the ethanol bark, DCM:M bark and ethanol leaf were  $102.21 \pm 4.28$ ,  $195.69 \pm 12.51$  and  $403.78 \pm 6.04$   $\mu\text{g/ml}$  respectively ( $p < 0.05$ ). However, at 500  $\mu\text{g/ml}$  assay concentration DCM:M leaf showed only  $27.31 \pm 2.61$  % inhibition.

In conclusion, both bark and leaf extracts of Ceylon cinnamon (*Cinnamomum zeylanicum* Blume) possess Glutathione S –Transferase enzyme inhibitory activity.