

## Pressured Water Extraction and Solvent Extraction of *Cinnamomum zeylanicum* (L.) Bark and Evaluation of Anti-Diabetic Properties

W. A. N. M. Wariyapperuma<sup>1</sup>, S. D. P. Kannangara<sup>2</sup>, Y. S. Wijayasinghe<sup>3</sup>, S. Skandaraja<sup>1</sup>, B. M. Jayawardena<sup>1</sup>

Pressured water extraction (PWE) is an environmentally friendly technique that has been used to extract anti-diabetic substances than solvent extraction. In the present study, Ceylon Cinnamon(CC, *Cinnamomum zeylanicum*) was selected as a natural source for anti-diabetic agent. The purpose of this study was to determine the inhibitory potential of  $\alpha$ -amylase and  $\alpha$ -glucosidase by CC bark extracts and to compare the efficiency of the extract with anti-diabetic properties from CC by PWE and solvent extraction. The dried bark of CC was powdered and extracted using pressured water (PW, 0.098 MPa), microwave digestion (MD), steam distillation (SD) and soxhlet extraction (SE) with 75% ethanol. The resultant extract from SE was fractionated with hexane. Each extract was tested for the total phenolic content (TPC) and content of proanthocyanidin (PC) using Folin-Ciocalteu method and vanillin assay respectively. IC<sub>50</sub> values of  $\alpha$ -amylase and  $\alpha$ -glucosidase inhibitions by the extracts were determined. Acarbose was used as the positive control.

Table 1: TPC, PC and IC<sub>50</sub> values of  $\alpha$ -amylase and  $\alpha$ -glucosidase inhibitions

As per the results in table 1 CC water extract obtained by pressured water and aqueous layer from SE have high

Type of extraction		IC <sub>50</sub> for $\alpha$ -amylase ( $\mu$ g/mL)	IC <sub>50</sub> for $\alpha$ -glucosidase ( $\mu$ g/mL)	PC mg of catechin equivalent/ g extract	TPC ( mg gallic acid equivalent/g extract)
SE	Hexane layer	201.14 $\pm$ 7.77	606.237 $\pm$ 239.51	7.34 $\pm$ 0.01	0.90 $\pm$ 0.02
	Aqueous layer	109.35 $\pm$ 6.52	59.70 $\pm$ 2.80	11.77 $\pm$ 0.16	3.90 $\pm$ 0.04
PWE		87.74 $\pm$ 12	132.103 $\pm$ 8.73	7.39 $\pm$ 0.06	2.90 $\pm$ 0.15
SD		119.51 $\pm$ 8.35	296.47 $\pm$ 42.87	5.65 $\pm$ 0.01	0.68 $\pm$ 0.02
MD		111.31 $\pm$ 4.12	158.65 $\pm$ 10.32	6.14 $\pm$ 0.01	1.73 $\pm$ 0.03

anti-diabetic properties compared to the other extractions. IC<sub>50</sub> values of  $\alpha$ -amylase and  $\alpha$ -glucosidase inhibitions by the acarbose were 95.06 $\pm$ 6.84 and 172.52 $\pm$ 12.06 respectively.

The financial assistance provided by National Science Foundation (SP/CIN/2016/03) is highly appreciated.<sup>4</sup>

**Keywords:**  $\alpha$ -amylase, *Cinnamomum zeylanicum* (L.),  $\alpha$ -glucosidase, pressured water extraction, solvent extraction.

<sup>1</sup>Department of Chemistry, Faculty of Science, University of Kelaniya, Kelaniya, Sri Lanka  
\*nmadushika00@gmail.com

<sup>2</sup>Department of Botany, Faculty of Science, University of Kelaniya, Kelaniya, Sri Lanka

<sup>3</sup> Department of Bio Chemistry, Faculty of Medicine, University of Kelaniya, Kelaniya, Sri Lanka