

## OP 40

### ***In vitro* $\alpha$ -amylase inhibitory activity of *Gmelina arborea* Roxb. aqueous extract encapsulated chitosan nanoparticles**

Wadasinghe RR<sup>1\*</sup>, Kalansuriya P<sup>2</sup>, Attanayake AP<sup>2</sup>, Bandara BMR<sup>1</sup>

<sup>1</sup>Postgraduate Institute of Science, University of Peradeniya, Sri Lanka, <sup>2</sup>Department of Biochemistry, Faculty of Medicine, University of Ruhuna, Sri Lanka.

**Background:** *Gmelina arborea* Roxb. is a medicinal plant used in complementary medicine with antidiabetic properties. *G. arborea* aqueous extract (GAE) has been reported to exert  $\alpha$ -amylase inhibitory activity. However, low bioavailability of polyphenols and flavonoids, and lack of appropriate delivery systems delimit use of GAE as a commercially viable antidiabetic agent. Chitosan, a promising carbohydrate biopolymer is gaining scientific attention in encapsulation of herbal extracts. The present study was to determine *in vitro*  $\alpha$ -amylase inhibitory activity of GAE encapsulated chitosan nanoparticles.

**Objective:** To investigate the  $\alpha$ -amylase inhibitory activity of GAE encapsulated chitosan-tripolyphosphate (CS-TPP) nanoparticles.

**Method:** Dried plant materials of *G. arborea* were extracted using distilled water under ultrasonication (40 kHz, 37 °C, 30 minutes) and the aqueous extract was freeze-dried. The CS-TPP nanoparticles loaded with freeze-dried GAE (37.5 mg) were prepared using the ionotropic gelation method (750 rpm, 35 °C, 60 minutes). Resulting nanoparticles were dissolved in DMSO and a concentration series (2.53-8.23 mg/mL) was prepared. The  $\alpha$ -amylase inhibitory assay was conducted in triplicate and the absorbance was measured ( $\lambda_{\max}=540$  nm) for the GAE encapsulated and unloaded CS-TPP nanoparticles using acarbose as the standard. The  $\alpha$ -amylase inhibitory activity is expressed as IC<sub>50</sub>.

**Results:** Percentage inhibition of  $\alpha$ -amylase inhibitory activity of unloaded chitosan nanoparticles were  $-8.4\pm 1.3\%$ . The percentage inhibition of encapsulated GAE (0.029 mg/mL) with the CS-TPP was  $21.1\pm 1.5\%$ . The IC<sub>50</sub> value of encapsulated CS-TPP nanoparticles with GAE was  $7.8\pm 0.2$  mg/mL whereas the IC<sub>50</sub> value of GAE was  $32.0\pm 6.7$   $\mu$ g/mL. The acarbose had an IC<sub>50</sub> value of  $11.7\pm 0.3$   $\mu$ g/mL.

**Conclusion:** The results reveal that the  $\alpha$ -amylase inhibitory activity of GAE was retained in the encapsulated GAE and the matrix material (CS-TPP) did not interfere with the  $\alpha$ -amylase inhibition. Future studies are warranted on the stability and *in vitro* releasing profile of GAE encapsulated CS-TPP nanoparticles.

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