

**ENZYME INHIBITORY ACTIVITY OF TWO CARBAZOLE ALKALOIDS  
ISOLATED FROM *Murraya koenigii* (CURRY LEAVES)**

**H.S.T. Kaushalya<sup>1</sup>, D. Dissanayake<sup>1</sup>, N.S. Kumar<sup>1</sup>, N.K.B. Adikaram<sup>1</sup>,  
L. Jayasinghe<sup>1\*</sup>, H. Araya<sup>2</sup> and Y. Fujimoto<sup>1,2</sup>**

<sup>1</sup>National Institute of Fundamental Studies, Kandy, Sri Lanka

<sup>2</sup>School of Agriculture, Meiji University, Kawasaki, Japan

\*ulbj2003@yahoo.com

Since ancient times, people have used plant parts and plant extracts to cure diseases and to relieve pain. Since the beginning of the 18<sup>th</sup> century, scientists have been discovering many plant-based drugs that are still used in medical practices. A current drug discovering strategy is to search for enzyme inhibitors. Inhibition of  $\alpha$ -amylase or  $\alpha$ -glucosidase enzyme with an effective inhibitor is one treatment strategy to control blood glucose level in diabetic patients. Acetylcholinesterase enzyme inhibitors are used in the treatments of neurological disorders. *Murraya koenigii* (Curry leaves) is used in Sri Lankan cuisine as a leafy spice and in the production of cosmetics because of its distinct aroma. Many carbazole and triterpenoid alkaloids with different pharmacological activities have been reported from *M. koenigii*. This study was focused on the investigation of  $\alpha$ -amylase,  $\alpha$ -glucosidase and acetylcholinesterase enzyme inhibitory activities of compounds present in leaves of *M. koenigii*. Dry powdered leaves were sequentially extracted with hexane, ethyl acetate and methanol and crude extracts obtained were chromatographed to furnish two pure compounds. The compounds were identified as 8-hydroxymahanimbine and (+)-(R) mahanine based on NMR analysis. The two carbazole alkaloids were tested for inhibitory activities against  $\alpha$ -amylase,  $\alpha$ -glucosidase and acetylcholinesterase enzymes. 8-Hydroxymahanimbine showed the highest  $\alpha$ -amylase inhibitory activity of  $IC_{50}$  85.2  $\mu\text{g mL}^{-1}$  and  $\alpha$ -glucosidase inhibitory activity of  $IC_{50}$  63.5  $\mu\text{g mL}^{-1}$  while (+)-(R) mahanine showed  $\alpha$ -glucosidase inhibitory activity of  $IC_{50}$  52.9  $\mu\text{g mL}^{-1}$  and acetylcholinesterase inhibitory activity  $IC_{50}$  29.7  $\mu\text{g mL}^{-1}$ . These findings suggest that 8-hydroxymahanimbine has a good potential as antidiabetic agent while (+)-(R) mahanine shows dual activities as an antidiabetic agent and an anticholinesterase agent. This is the first report of 8-hydroxymahanimbine as a natural product.

**Keywords:** Carbazole alkaloids, Enzyme inhibitors, 8-Hydroxymahanimbine, (+)-(R) mahanine