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Antidiabetic and Antiparasitic Potentials: Inhibition Effects of Some Natural Antioxidant Compounds on α-Glycosidase, α-Amylase and Human Glutathione S-transferase Enzymes

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Abstract

The GST was purified from fresh blood erythrocytes using affinity column chromatography. Also, α-amylase from porcine pancreas and α-glycosidase from Saccharomyces cerevisiae were used as enzymes. In this study, these compounds were tested on α-amylase, α-glycosidase, and GST enzymes and demonstrated effective inhibitor compounds with K_i values in the range of 8.34–40.78 µM against GST, and 120.53–892.36 nM against α-glycosidase. Additionally, the phenolic molecules were tested for the inhibition of α-amylase enzyme which determined effective inhibition profile with IC_{50} values in the range of 175.01–626.58 nM. Indeed, these molecules can be elective inhibitors of GST, α-glycosidase and α-amylase enzymes as antidiabetic and antiparasitic agents.

Keywords: Antidiabetic; Antiparasetic; Glutathione S-transferase; enzyme inhibition.

Running Head: Biological effects of natural antioxidant compounds

1. Introduction

Phenolic hydroxyl compounds are good H-donating antioxidants, which removed the cycle of production of new radicals and scavenge reactive oxygen species (ROS) [1,2]. The radical