

## **In vitro $\alpha$ -Amylase and $\alpha$ -Glucosidase Inhibitory Activities of Bitter Melon (Momordica charantia) with Different Stage of Maturity**

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**Abstract :** Bitter melon (*Momordica charantia*) is a medicinal vegetable, which is used traditionally to remedy diabetes. Bitter melon contains several classes of primary and secondary metabolites. In traditional Turkish medicine bitter melon is used for wound healing and treatment of peptic ulcers. Nowadays, bitter melon is used for the treatment of diabetes and ulcerative colitis in many countries. The main constituents of bitter melon, which are responsible for the anti-diabetic effects, are triterpene, protein, steroid, alkaloid and phenolic compounds. In this study total phenolics, total carotenoids and  $\beta$ -carotene contents of mature and immature bitter melons were determined. In addition, in vitro  $\alpha$ -amylase and  $\alpha$ -glucosidase activities of mature and immature bitter melons were studied. Total phenolic contents of immature and mature bitter melon were 74 and 123 mg CE/g bitter melon respectively. Although total phenolics of mature bitter melon was higher than that of immature bitter melon, this difference was not found statistically significant ( $p > 0.05$ ). Carotenoids, a diverse group of more than 600 naturally occurring red, orange and yellow pigments, play important roles in many physiological processes both in plants and humans. The total carotenoid content of mature bitter melon was 4.36 fold higher than the total carotenoid content of immature bitter melon. The compounds that have hypoglycaemic effect of bitter melon are steroidal saponins known as charantin, insulin-like peptides and alkaloids.  $\alpha$ -Amylase is one of the main enzymes in human that is responsible for the breakdown of starch to more simple sugars. Therefore, the inhibitors of this enzyme can delay the carbohydrate digestion and reduce the rate of glucose absorption. The immature bitter melon extract showed  $\alpha$ -amylase and  $\alpha$ -glucosidase inhibitory activities in vitro.  $\alpha$ -Amylase inhibitory activity was higher than that of  $\alpha$ -glucosidase inhibitory activity when IC50 values were compared. In conclusion, the present results provide evidence that aqueous extract of bitter melon may have an inhibitory effect on carbohydrate breakdown enzymes.

**Keywords :** bitter melon, in vitro antidiabetic activity, total carotenoids, total phenols

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