ABSTRACT

Charles University
Faculty of Pharmacy in Hradec Králové
Department of Pharmacognosy and Pharmaceutical Botany
Student: Michaela Kašpárková
Supervisor: PharmDr. Jana Karlíčková, Ph.D.
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α-glucosidase is one of the main enzymes that break down carbohydrates in the digestive tract. Its physiological function is mainly the cleavage of α-(1,4) bonds of oligosaccharides and enabling the absorption of D-glucose into the bloodstream. As a result, there is an increase in postprandial blood glucose values, which is not desirable in patients with diabetes or in people with a high risk of developing it.

Flavonoids are natural polyphenolic substances found in many natural components of our food. These substances are known for their positive effects on human health, which also include the ability to inhibit the α-glucosidase enzyme. Therefore, the aim of this work was to determine the inhibitory activity of flavonoids against the α-glucosidase enzyme and the subsequent assessment of the structure-activity relationship.

Using twenty-two selected flavonoids belonging to five different structural groups, the inhibitory activity on the yeast α-glucosidase from *Saccharomyces cerevisiae* was determined by spectrophotometric measurements *in vitro*. The results were compared according to the curves showing the 95% confidence intervals of the relationship between enzyme inhibition and the concentration of the test substance.

The measurement results showed that six substances (kaempferol, morin, quercetin, 7,8-dihydroxyflavone, luteolin and hesperetin) inhibited yeast α-glucosidase more effectively than the registred drug acarbose, which was chosen as the standard substance in this work. These flavonoids shared several structural similarities, including hydroxy groups on carbons 3, 5, 7, and 4', a keto group on carbon 4, and a double bond between carbons 2 and 3.

In conclusion, some natural flavonoids could be an interesting alternative to acarbose, but their effects on mammalian α-glucosidase still need to be confirmed.