ABSTRACT

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Title of Thesis: Interactions of tamarixetin and isorhamnetin with copper

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Copper is a biogenic trace element important for proper function of human organism. It is an essential part of several enzymes and is involved in metabolic processes in the body. Excess or lack of serum copper can lead to pathological conditions. Copper chelating agents are used to treat copper toxic effects.

Flavonoids are polyphenolic substances belonging to secondary metabolites of various plants. They are part of the human diet and have a positive impact on our health. They exhibit antioxidant and anti-inflammatory effects and are able to chelate transient metals, especially iron and copper. Chelation therapy is currently used in Wilson's disease in which copper is overloaded. In the future, the chelating effects of flavonoids could be used to treat neurodegenerative diseases, cardiovascular diseases or cancer.

In this diploma thesis, interactions of two flavonoids (namely tamarixetin and isorhamnetin) with copper ions in different buffers were tested. Spectrophotometric methods based on hematoxylin or bathocuproine as indicators, were used to measure copper-chelating and reducing activities.

Both substances showed very good ability to reduce and to chelate copper ions. Their activity varied depending on the pH.

It has been confirmed that the 4-keto-5-hydroxy group is a structural presumption for chelating of copper ions in flavonoids and also that the hydroxyl group of tamarixetin located in the ring B at the position 3' is probably more important for chelating activity than when it is located at the position 4' as in isorhamnetin.