

treatment and the further prognosis of the patient's life depends on the quality of diagnostics directly.

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ANTIOXIDANT PROPERTIES OF CITRUS FRUITS JUICE

High concentration of free radicals in the body is one of the major risk factors of developing cardiovascular and oncological diseases and other pathological conditions. Flavonoids are powerful antioxidants which can be used in the prevention of various diseases. Naringin and hesperidin are one of the most common flavonoids that can be found in citrus fruits. These flavonoids display the unique ability to increase elasticity and capacity of blood vessels. Thus, these flavonoids can be employed in the prevention of cardiovascular diseases. These flavonoids also enhance the work of the liver and produce anti-inflammatory effect. Hesperidin is contained in oranges, tangerines, lemons and limes. Moreover, lemons and limes contain eriocitrin which is similar to hesperidin in its structure and properties. Naringin can be found in grapefruits. All of these flavonoids have similar structure – they have a glycoside that can enhance their antioxidant properties because of additional OH-groups. We used freshly squeezed orange, tangerine, grapefruit, lemon and lime juices to analyse the antioxidant properties (AP) of these flavonoids. Moreover, we also compared the properties of freshly squeezed orange and grapefruit juices with that of packaged orange and grapefruit juices from different manufacturers.

The method of the AP detection in relation to reactive oxygen species (ROS) is based on the measurement of the oxidized compound fluorescence intensity and its reduction due to ROS. We used fluorescein which is a compound with high extinction coefficient and fluorescence quantum efficiency close to 1 for the detection of free radicals. Free radicals were generated using the Fenton system with hydroxyl radicals generated in the reaction of Fe^{2+} complexes with ethylenediaminetetraacetic acid (EDTA) and hydrogen peroxide.

The relationship between fluorescence intensity of fluorescein and juice concentration logarithm was analysed for each sample with juice concentration of 0.01–10%. Orange juice exhibited the highest antioxidant activity; its fluorescence recovery was 78% with 2% juice concentration. AP of grapefruit juice and tangerine juice were somewhat lower: ROS activity was reduced to 61% and 52% respectively. Fluorescence recovery for lemon and lime juices was 44–45% with 0.2% juice concentration. Packaged orange juice and grapefruit juice had the lowest AP in comparison with freshly squeezed juice with fluorescence recovery of 47–56%. IP50 values (juice concentration with 50% of free radical inhibition) were presented in graphic form.

According to their free radicals scavenging properties, citrus fruits may be arranged in the following order: orange > grapefruit > tangerine > lemon > lime with IC50 of 0.073–0.73% which demonstrates high antioxidant properties of the citrus juices analysed.

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THE USE OF CYTOLOGICAL INDICES OF ALLIUM CEPA AS TEST OBJECTS IN ANTHROPOGENICALLY DISTURBED AREAS

The ever-growing degradation of the natural environment under the influence of anthropogenic pollution poses a threat to the survival of mankind. As a rule, almost any man-made phenomena and processes occurring within the immediate impact of industrial production, quickly affect the condition of ecosystems as a whole. Modern technical means of control of environmental conditions, designed primarily to assess the extent of contamination in the industrial environment are not the only ways to determine the state of the natural environment.

The soil is actively involved in many important processes of transformation of substances. Among numerous soil pollutants, heavy metals make a significant contribution to environmental pollution. As a result of research of many scientists in recent years to study the impact of heavy metals on plants and animals. Meanwhile, the toxic effect of heavy metals on plants is manifested, as a rule, when a high level of technogenic pollution of soils and depends on the properties and behaviors of a specific metal.

Bioindication is the best and actively developing method of its evaluation. It involves the observation of natural and anthropogenic processes in biological environments, including the totality of the interaction of the living with agents of the external environment, including the elucidation of responses of biological media on natural and anthropogenic influences. Biological methods help to diagnose negative changes in the environment at low concentrations.

In bioindicators can be plants, animals, protozoa. Vegetation is the main component of biogeocenosis, which provides the livelihoods of other biotic components. Vegetation changes under the influence of various environmental factors affect the condition of ecosystems in General and therefore are used as diagnostic features. In the study we used a widely encountered bioindicator – *Allium cepa*. In contemporary studies of *Allium cepa* L. the reference plant is considered a test object for analysis of the mutagenicity of mitotoxicity and toxicity of various factors. *Allium* test is recommended by who experts as the standard in the cytogenetic monitoring of the environment. The results obtained using this test correlate well with tests on other organisms: plants, insects, mammals.