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ABSTRACT BOOK

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From the other side, formation of tyrosine dimers as well as paracetamol dimers and oligomers is lowered down in presence of thiamine and its phosphate esters. Mechanism of the coupled oxidation of thiamine and its phosphate esters with oxidation of monophenols in peroxidase reaction catalyzed by metmyoglobin and hydrogen peroxide is discussed. The obtained results indicate that at oxidative stress conditions presence of paracetamol leads to increased oxidation of thiamine and its phosphate esters producing thiochrome and thiochrome phosphates. Thus, toxicity of paracetamol in organism may be related not only to formation of toxic NAPQI by microsomal monooxygenases of liver but also to a decreased level of thiamine diphosphate which leads to inhibition of thiamine-dependent enzymes activity and contributes in development of patophysiological processes at oxidative stress. The obtained results suggest increase of thiamine administration at pathologies related to oxygen stress conditions and particularly when treatment with paracetamol is performed.

Keywords: metmyoglobin, oxoferryl forms of hemoproteins, phenoxyl radicals, thiamine, thiochrome, oxidative stress

Microbiological Activity of the Optimized Sod-Podzolic Soil as an Important Element of Stability of Agroecosystems

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Abstract

The main direction of modern land use, in accordance with the principles of ecological imperative, is the agroecological concept, which aims to achieve optimal functioning of the agroecosystem. Sustainable development of the agroecosystem is achieved by optimizing its structure and all components.

Biological activity is one of the most sensitive indicators, reflecting the ecological condition and level of soil fertility. Synthesis of the basic mass of organic matter is carried out mainly by plants. The main activity of soil microorganisms is the mineralization of organic matter. In the process of mineralization exempt nutrients, which determines to a considerable extent on natural soil fertility.

On vital activity of microorganisms is influenced by different factors: soil temperature, humidity, types of soil-forming processes, grow crops etc.

A major role in the decomposition of organic compounds of different soil bacteria play. Destruction of cellulose on (82-94%) is carried out by bacteria and only 18-16% by mold fungi.

In the experimental base «Budagovo» (Smolevichi region, Belarus) from 1978 to 1990, was conducted a field experiment on optimization of sod-podzolic waterlogged soils (luvisols and albeluvisols for the WRB) by applying absolutely dry peat in doses of 100, 200, 300 and 400 t / ha (tons per hectare). The aim was to create an artificial arable horizon with an organic matter content of 7-8%, including 4-5% humus.

More than 20 years to prove the effectiveness of the method optimization the experimental plots were taken soil samples for various tests, including microbiological activity.

For the microbiological analysis of the soil samples were taken from a depth of 10-50 cm from four field replications.

The intensity of decomposition of fiber was taken into account by the gravimetric method. The difference between the weight of the original and remaining after extraction from the soil tissue was judged by the intensity of the process of destruction of cellulose.

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The intensity of decomposition of fiber in the optimized waterlogged soil (%of initial fabric weight) were as follows: background – 16 %, background+100 t/ha – 20%; background+200 t/ha – 22 %; background+300 t/ha – 25% background+400 t/ha – 26%.

On a mineral optimized soil, microbiological processes proceed more slowly 2.2 times under perennial grasses than under a tilled crop.

Microorganisms are unevenly distributed in the profile. The upper half of the application of cotton fabric, which was located approximately up to 30 cm, was subjected to greater decomposition. With the depth the number of microorganisms in the soil is reduced.

By the method of applications of cotton fabric, a direct correlation of microbiological intensity is established from the doses of introduced organogenic additives.

Keywords: microbiological activity, soils, agroecology, optimization of soil.

Microscopic Diagnostics of Species (*Nepeta* Genus) Based on the Leaf Epidermis Structure

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Abstract

Currently, widely used in botany, the method of microscopic analysis makes it possible to give an objective assessment of the authenticity of medicinal plant raw materials, except for the simple enumeration of anatomical and diagnostic features, their sizes are normalized. Some closely related plants have similar anatomical and diagnostic features, differing in frequency and size. In this regard, the aim of the work was to identify diagnostic features in the epidermal structure of the leaf in *Nepeta Cataria, Nepeta Grandiflora*, which can be used for diagnosis at a species level.

Microscopic studies were conducted on freshly collected and fixed biomaterial. The surface, compressed preparations and cross sections were produced by hand using a dangerous blade. When describing the anatomical structure, the conventional terminology proposed by K. Ezau was used [1, p. 218]. The description of external signs was carried out in accordance with the requirements included in the State Pharmacopoeia [2, p. 252-257].

It is established that in the studied species, the outlines of the epidermal cells are sinuous, the projection of the epidermal cell area is planar in plan, and the corners in the adjacent boundaries are rounded and pointed. The epidermis of the top leaf of *Nepeta grandiflora L* is represented by thin-walled sinuous cells with a diameter of 40-50 μm, the epidermis of the upper side of the *Nepeta cataria L.* leaf is represented by large, tortuous-walled epidermal cells (35-40 μm) tightly closed with each other. There is abundant pubescence of simple hairs. The length of simple hairs in *N. Cataria L.* is 100-120 microns, in *N. Grandiflora* it is 90-100 microns. The stomata of *Nepeta grandiflora L.* are very small, located on both sides of the leaf. Stem *Nepeta cataria* L. small, numerous, rounded, located on both sides of the leaf chaotically. The size of stomata is on average 35 μm in diameter. The type of stomatal apparatus is diatomic. Essential oil glands *Nepeta* grandiflora L. are large, rounded. In. the essential oil glands are monocyclic, large, round in shape. Formed by *Nepeta cataria L* 4 secretory cells. No outlets.

The results of the work are a theoretical basis for establishing the authenticity of medicinal plant material, they make a great contribution to the taxonomy. The established anatomical and morphological structural criteria of identification of plant raw materials will allow to determine the possibility of their use in medicine.