The hyperecin had a high value of free energy value (-9.19 kcal/mol), whereas IC50 was 0.00018505 mmol, so hyperecin belong to high selective inhibitor. Comparing result with diclofenac sodium standard, the affinity of hyperecin was 49% more than of diclofenac sodium (-4.65 kcal/mol, IC50 – 0.39 mmol).

It was established that hyperecin is a potentially medium selective inhibitor of myeloperoxidase. So, the extract with hyperecin can be applied for developing a new antioxidant drugs for preventing oxidative stress.

Relation structure and action of antimicrobial activity α-arbutin, β-arbutin and hydroquinone

[1]Maslov O. Yu., [2]Komisarenko M. A., [1]Kolisnyk S. V., [3]Ponomarenko S. V., [3]Osolodchenko T. P.

[1]Department of General Chemistry, [2]Department of Pharmacognosy and Nutriciology, National University of Pharmacy, Kharkiv, Ukraine

[3]Laboratory of Biochemistry and Biotechnology, Mechnikov Institute of Microbiology and Immunology of the NAMS of Ukraine, Kharkiv, Ukraine

alexmaslov392@gmail.com

Arbutin (C12H16O7) is aglucopyranoside of hydroquinone with two different configurations: alpha (α) and beta (β). The β-isomer can only be obtained from medicinal raw materials, and inturn, the α-isomer is its synthetic analog; the main difference between these isomers is that instead of β-glucose there is α-glucose. Hydroquinone is an aromatic compound which consists of benzyl and 2 OH groups in para-positions. Hydroquinone is a highly toxic compound and is carcinogenic.

All over the world, arbutin-containing medicinal raw materials (lingonberry and bearberry leaves) are used for the treatment and prevention of cystitis, glomerulonephritis and pyelonephritis, as uroseptic, diuretic and antiazotemic agents

According to this theory, arbutin has a uroseptic effect only due to the action of hydroquinone and nothing more, it turns out that arbutin does not have an antimicrobial effect at all, which is also a contradiction. In our opinion, the discussion of the theories of the mechanisms of uroseptic and diuretic action of arbutin is still open in the scientific community.

Thus, the aim of our study was to investigate *in vitro* antimicrobial action of α- and β-arbutin, hydroquinone, and also to conduct a comparative analysis of the antimicrobial properties of these compounds and to refute the theory of the presence of the antimicrobial action of arbutin only due to the action of hydroquinone.

The method of diffusion of the drug into agar carried out using the method of "wells". *Staphylococcus aureus* ATCC 25923, *Escherichia coli* ATCC 25922, *Bacillus subtilis* ATCC6538, *Candida albicans* ATCC 885/653, *Proteus vulgaris* NTCS 4636 и *Pseudomonas aeruginosa* ATCC 27853 were used in accordance with established guidelines for assessing the antimicrobial efficacy of pharmaceuticals.

Table 1. Minimal inhibitory concentration of the α-arbutin, β-arbutin, hydroquinone against the strains of *S. aureus, B. subtilis, P. aeruginosa, E. coli*, *P. vulgaris* and *C. albicans*

Sample	**MIC, mM**					
	Gramm-positive strains		***Gram0m-negative strains***			***Fungi strains***
	S. aureus ATCC 25923"	*B. subtilis* ATCC 6538	*E. coli* ATCC 25922	*P. vulgaris* ATCC 4636	*P. aeruginosa* ATCC 27853	*C. albicans* ATCC 653/885
β-Arbutin	0.00078 (1:256)	0.00078 (1:256)	0.00156 (1:128)	0.00313 (1:64)	0.00156 (1:128)	0.00156 (1:128)
α-Arbutin	0.00078 (1:256)	0.00078 (1:256)	0.00078 (1:256)	0.00156 (1:128)	0.00078 (1:256)	0.00156 (1:128)
Hydroquinone	0.00313 (1:64)	0.00313 (1:64)	0.00625 (1:32)	0.00125 (1:16)	0.00625 (1:32)	0.00625 (1:32)

In the studies of antibacterial and antifungal activity of the compounds by the "well" method, it wasshown that hydroquinone inhibits gram-positive bacteria more actively than β- and α-arbutin, and in the case of gram-negative bacteria, α-arbutin had a higher inhibitory effect than β-arbutin and hydroquinone, while β-arbutin actively inhibits the growth of fungi than α-arbutin and hydroquinone.

It was found that the MIC of hydroquinone for gram-positive, gram-negative and fungi was almost 2 to 3 times greater than the MIC value of β- and α-arbutin. Meanwhile, the MIC of α-arbutin was lower for *E. coli*, *P. vulgaris* than β-arbutin, and in other cases the results were the same. Taking into account only the antimicrobial results obtained by the "wells" method, it may seem that hydroquinone is a stronger inhibitor than its glycoside forms. But, the "dilution" method showed that hydroquinone is significantly inferior to β- and α-arbutin, and in order to suppress the growth of bacteria and fungi, hydroquinone will need much more than its glycoside forms.

According to theoretical and practical results, the antimicrobial action of α- and β-arbutin is 2-3 times higher than that of hydroquinone. It was experimentally confirmed that α-arbutin inhibits the growth of gram-negative strains much more strongly than β-arbutin. The theory that arbutin has an antimicrobial effect only due to the action of hydroquinone was refuted practically.

The prospect of using the fungi of the genus Pleurotus in biotechnology

Mikhailova K. I., Koziko N. O.

Department of Pharmacy and Industrial Medications Technology,

Bogomolets National Medical University, Kyiv, Ukraine

mikhailovak26@gmail.com

Pleurotus spp. is the object of intensive research in the field of food technology and nutrition due to their unique chemical composition, high nutritional value and potential wellness properties. They are classified as functional foods due to the presence of biologically active components that can have a positive effect on human health. In recent decades, there has been an increase in the popularity of these fungi, which is explained by their favorable impact on metabolic processes and the possibility of use in the prevention and treatment of lifestyle diseases.

The genus Pleurotus includes about 200 species, among which Pleurotus ostreatus (common mushroom) is the most common in the world. It is characterized by high nutritional value and content of natural antioxidants, which contribute to the reduction of oxidative stress and protection of cells of the body. Mushrooms are a rich source of protein, diet, B vitamins, vitamin C and key minerals (iron, potassium, magnesium, zinc). Their amino acid composition contains increased levels of