

Correction methods of medicinal properties of mineral waters in Pyatigorsk resort

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Mineral Water (MW) of Pyatigorsk deposit (PD) is united in five genetic groups (operational stocks of 2809,8 m³/day): carbonic and hydrosulphuric, carbonic, carbonic chloride-hydrocarbonate sodium (salt and alkaline), radonic low carbonate, nitrogen-carbonic terms.

A variety of MW types is explained by peculiarities of geological structure and hydrogeological conditions of PD. Here on the sites of the development of deep semi-ring splits there are overflows and a mixture of various complexes. Unloading of deep water strikes happens not only on the earth surface in the form of springs but also at the depth in its edging crumbling rocks of Palaeocene and quarternary deposits. As a result of mixture processes of water and its subsequent metamorphization, various types of mineral water of this deposit are formed.

Pyatigorsk resort is in a special protected ecologo-resort region which mode allows to keep stability of structure and ecological purity of MW. Nevertheless, MW variability, compositional differences and MW mineralization determining the level of its biological effect demand studying of action mechanisms of both natural MW, and possibility of its modification for range expansion of rehabilitation action.

There have been examined biological effects of the course drinking reception In experiment on 80 rats males of the Wistar line biological effects of the course drinking reception of two MW types: "Krasnoarmeyskaya new" (MW1) of sulphate-hydrocarbonate-chloride calcium-sodium structure with the raised contents of iron (3-5 mg/dm³), mineralization of 5,0-5,2 g/dm³, CO₂ of 1,3-2,2 g/dm³, daily flow of 10-86 m³/day, temperature from 14 to 370 on the mouth of the well and spring №2 (MW2) low sulphate, low carbonate sulphate-hydrocarbonate-chloride calcium-sodium, mineralization of 5,0 g/l, CO₂ of 0,7 g/dm³, H₂ of S 0,01 g/dm³.

There has been shown an ability of the drinking course MW1 to influence on endocrine and metabolic continuum – cortisol level increased by 1,86 times at simultaneous decrease in ACTH in 47% in comparison with the control. The decrease in lipid peroxidation intensity in 21,7% due to the change of antioxidant system capacity (ASC) - level glutathione peroxidases (GPO) with 50% of animals higher than 7 ng/l, in control group 0,7 ng/l-6,9ng/l was also noted.

Modification of MW1 by selenium nanoparticles in a dosage of 20 and 40 mkg/kg led to the increase of GPO level with 75% of animals. The preventive course of MW1 with oil extract from Tambukan mud before the reproduction of the sharp model of toxic liver involvement CCL4 promoted the decrease in blood serum of the level of damage markers of plasmatic membranes of an alaninaminotransferaza (ALT) and alkaline phosphatase for 9% and 19,6% respectively. So at simultaneous decrease in cholesterol level (for 13,5%) and triglycerides (for 57,1%) in comparison with the control (pathological model). Medical courses of drinking reception of MW1 and MW2 promoted the increase of stability of cellular membranes – ALT level was noted at 17-22% below control (pathological model).

Conclusions: The course reception of natural and modified drinking mineral waters of Pyatigorsk resort increases nonspecific resistance of an organism to the action of toxic factors.