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THE INFLUENCE OF BIOLOGICALLY ACTIVE COMPOUNDS ON OXIDATIVE STRESS MARKERS AND ANTIOXIDANT SYSTEM

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Introduction. The development of degenerative processes relates to the presence of excessive harmful free radicals, which cause damaging oxidative processes within the body. Various defense mechanisms protect cells from the destructive potential of free radicals. These include antioxidant enzymes: superoxide dismutase, catalase, glutathione S-transferase, glutathione peroxidase and glutathione reductase. These enzymes play a significant role in reducing oxidative stress, by preventing the spread of harmful free radicals.

Material and methods. The present study used the {N- (prop-2-en-1-yl) -2 - [(pyridin-2-yl) -methylidene] hydrazine-1-carbothioamide} aquacupper (II) chemical compound and the MX1 extract – a biological compound, which is a pigment of Myxoxanthophyll carotenoids, obtained from Spirulina platensis biomass at a concentration of 0.214 mg/ml in 80% aqueous solution of ethyl alcohol.

The study also determined both the separate and combined effects of chemical and biological compounds on the spontaneous production of biochemical parameters, which was carried out *in vitro* according to the method described by Rîjcova S. et al. with some modifications. To assess the oxidative stress, the malondialdehyde (MDA) concentration and the advanced oxidation protein products (AOPP) were determined, whereas the antioxidant system was assessed via the identification of the activity of superoxide dismutase (SOD), total antioxidant (TAA), glutathione-S-transferase (GST), catalase (CT), glutathione peroxidase (GPX) and glutathione reductase (GR). The blood tests were collected from 10 healthy people aged 25 to 35 years.

Results. The research findings showed that the biological compound under study had positive effects on all the studied parameters, reducing both the MDA, µM/L (p=0.0085) and AOPP values, µM/L (p=0.018) on the one hand and increasing the potential antioxidant (SOD, u/c (p=0.0035), CT, µM/L (p=0.0029), TAA, µM/L (p=0.0059), GST, nM/sL (p=0.024), GPX, nM/sL (p=0.0041) and GR, nM/sL (p=0.0064)) on the other hand. The tested chemical compound exhibited negative effects, which led to higher MDA, µM/L (p=0.0085) and AOPP, µM/L (p=0.027) values. However, the chemical compound favored the antioxidant system (SOD, u/c (p=0.0035), CT, µM/L (p=0.0248), TAA, µM/L (p=0.0173), GST, nM/sL (p=0.023), GPX, nM/sL (p=0.0365) and GR, nM/sL (p=0.0076)). While studying the activity results of the tested combined compounds, we found that the biological compound determines positive effects, particularly on the oxidative stress markers, though no expected effect potentiation was found.

Conclusions. Based on the obtained research findings regarding the biological compound with optimal effects on the studied systems, further relevant studies should be carried out. At the same time, the obtained results require confirmation under *in vivo* study conditions, thus not allowing concluding on the quantitative effect of the investigated substances, the argument being the relatively small number of respondents, determining wide confidence intervals and being one of the study limitations.