2nd Belgrade International Molecular Life Science Conference for Students

ABSTRACT BOOK & PROGRAM

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MICROBIAL LEVAN AS A POTENTIAL AGENT FOR REDUCING OXIDATIVE STRESS IN DAPHNIA MAGNA


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In the recent years there has been a great interest in microbial polysaccharides due to its numerous applications in food industry, cosmetics, pharmacy and medicine. Microbial levan as a representative of that group can also be used as eco-friendly adhesive, dietary fibre, flavour enhancer, blood plasma volume expander, nanoparticle, antioxidant and antitumor agent. To minimize oxidative damage in cells, organisms have developed a number of pathways for defense. This includes production of antioxidant enzymes: catalase, superoxide dismutase, glutathione peroxidase etc. Aquatic organisms are currently exposed to diverse toxicants, therefore, investigating potential agents for reducing toxicity is very attractive. Aim of this study was to compare oxidative stress induced by copper(II) in Daphnia magna in the presence and absence of levan. Levan was isolated from the Bacillus licheniformis NS032 strain. The D. magna juveniles were exposed to sublethal concentration of Cu(II), mentioned as S-Cu, or combination of levan and sublethal concentration of Cu(II) mentioned as LEV-S-Cu. Antioxidant enzymes were measured in daphnids after 7 days of exposure period. Catalase activity was determinate according to Aebe (1984) and superoxide dismutase activity was measured in method described by Kono (1978). The response of enzyme activity in the control group was different compared to the animals exposed to Cu(II) as it was expected. Interestingly, the responses also varied between animals exposed to Cu(II)) and the combination of Cu(II) and levan. The catalase activity decreased in samples exposed to LEV-S-Cu (14.55 x 10-5 U/animal) compared to those exposed only to S-Cu (11.76 x 10-5 U/animal). The SOD activity was also lower in animals exposed to LEV-S-Cu (8.93 x 10-7 U/animal) in comparison to animals exposed to S-Cu (9.70 x 10-7 U/animal).