



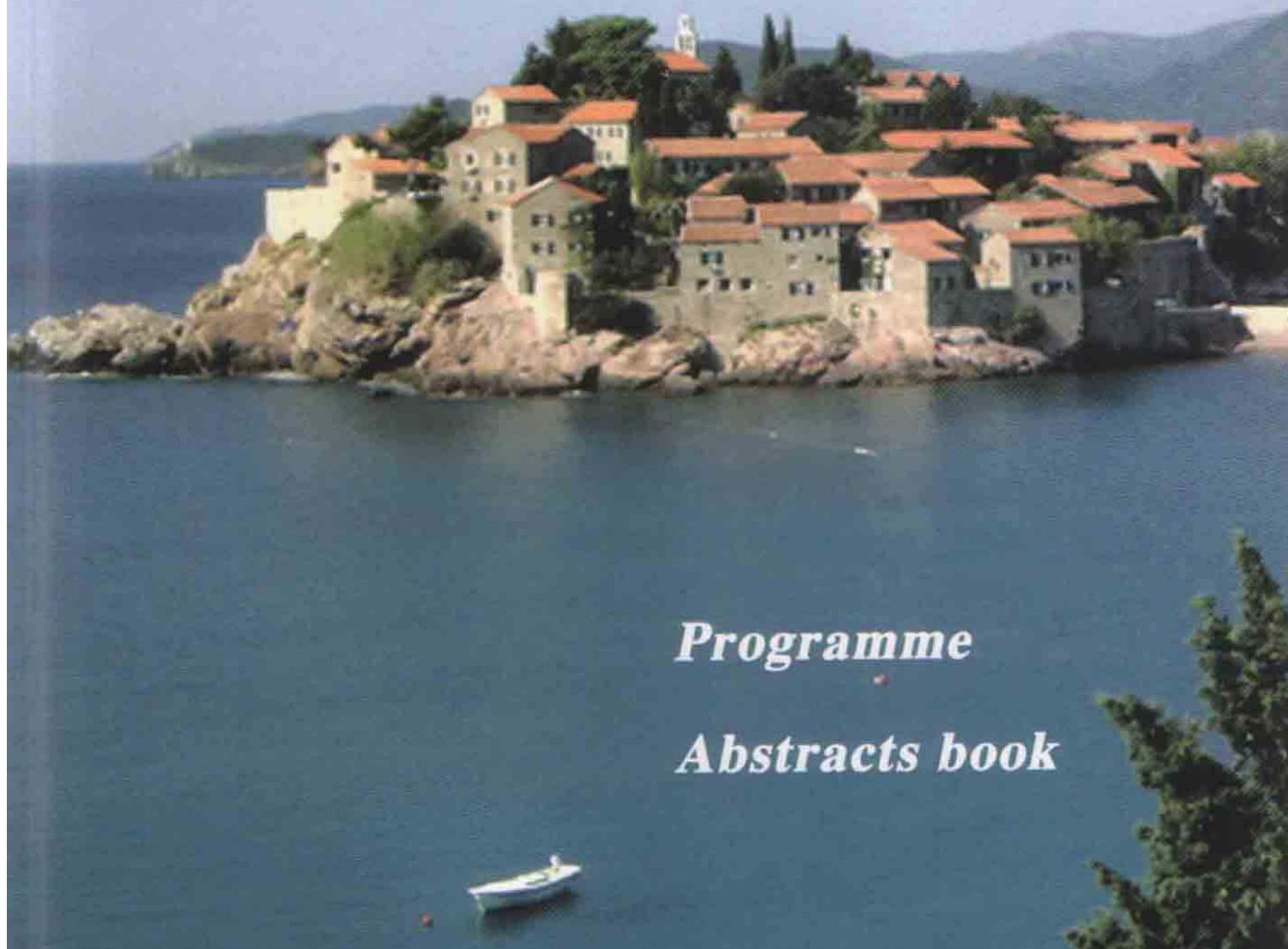
5th BALKAN CONGRESS FOR MICROBIOLOGY

24 - 27 October 2007 Budva,
MONTENEGRO

Balkan Society for
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evidenced that Tylts1 test: 1) verified the presence of genotoxins detected with Ames and D7ts1 tests; 2) estimated very similar pollution levels with respect to induced genetic end-points to those measured with D7ts1 test, however required eight-fold shorter incubation time of the yeast cells with the samples; 3) responded positively to the samples negative in the Ames test.

Conclusion. Tylts1 test is a fast, cheap and sensitive method, which in combination with the Ames test gave the opportunity for complete assessment of the environmental pollution levels.

Key words: yeast, retrotransposon, carcinogens, environment

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EFFECT OF α -TOCOPHEROL AND α -TOCOPHEROL +NITRIC OXIDE DONOR ON L929 CELLS

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From its discovery the hypothesis that all of the α -tocopherol in vivo effects result from its role as a lipid soluble antioxidant was dominant. α -tocopherol has been described to inhibit protein kinase C in various cell types with consequent inhibition of platelet aggregation, endothelial cell nitric oxide production and superoxide production in neutrophils and macrophages [1]. Molecular base for all the effects of α -tocopherol may represent its interactions with hydrosoluble antioxidants and effects on endogenous antioxidative defense enzymes such as superoxide dismutase. In present experiments we were examined effects of α -tocopherol on free -SH and glutathione content and activity of CuZnSOD in L929 cell culture.

The mouse fibroblast cell line L929 grows as monolayer in DMEM medium (Gibco). Mediums was supplemented with 2 mM glutamine, 10 % FCS (fetal calf serum, NIVNS) and antibiotics: 100 IU/ml of penicillin and 100 mg/ml of streptomycin (ICN). Cells are cultured in flasks (Costar, 25 cm³) and incubated at 37 °C in the 100 % humidity atmosphere and 5 % of CO₂. Glutathione was assayed as total glutathione, i.e., the sum of the reduced and oxidized forms by a enzymatic assay according to Griffith [2]. Free -SH groups were determinate according to Ellman [3]. Total SOD activity was measured according to the McCord and Fridovich [4]. α -tocopherol pretreatment of L929 have no effect on free -SH and total glutathione amount but have statistically significant effect on increase of SOD activity, which is further increased with nitric oxide donor sodium nitropruside (SNP). As CuZn-SOD knockout animals are viable but fibroblasts derived from those animals proliferate more slowly (75 %) than control cells. the importance of CuZn-SOD in cell growth and survival is established and our results indicate direct effect of α -tocopherol on SOD not mediated with his effect on hydrosoluble antioxidant in this cell line.

References:

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Key words: α -tocopherol, antioxidant, superoxide dismutase

P_{4.55}

REMOVAL OF CU(II), CO(II) AND FE(III) IONS FROM TERNARY SOLUTION USING FREE AND ENTRAPPED IN PVA-HYDROGEL BIOMASS OF PENICILLIUM CYCLOPIUM

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Objectives: The objective of this study was to investigate the ability of Penicillium cyclopium resting cells entrapped into poly(vinyl alcohol) (PVA) network to remove Cu (II), Co (II) and Fe (III) ions from ternary solutions.

Methods: Hybrid hydrogels constituted of P. cyclopium cells immobilized in hydrophilic polymer network have been obtained in situ by crosslinking the PVA aqueous solutions with glutaraldehyde when dispersing wet biomass in the media. Batch sorption equilibrium experiments using free and immobilized in PVA-hydrogel biomass of Penicillium cyclopium were carried out using ternary mixture of corresponding metal ion solutions. Metal binding abilities of the hybrid hydrogels for Cu (II), Co (II) and Fe (III) ions were determined by using atomic absorption spectrophotometer.

Results: The performance of free and immobilized biosorbents was evaluated by sorption kinetics and sorption capacities for different metal ions in the mixture. Immobilized system showed higher removal efficiency (expressed as mg metal ions removed per mg metal ions added) in comparison to the free cells system. In addition, the immobilized system showed 2-fold shorter time for reaching the equilibrium in comparison to the free cells. The pseudo-second order kinetic model was applied to the multi-component experimental data and important kinetic parameters of the biosorption process were calculated.

Conclusion: The immobilized system of organic polymer with entrapped fungal biomass showed high biosorption performance and may be used successfully for the removal of Cu (II), Co (II) and Fe (III) ions from ternary mixed solutions. The results obtained suggest that the immobilized biosorbent holds great potential for wastewater treatment applications.

Key words: biosorption, Penicillium cyclopium, kinetics

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METAL-BINDING HYBRID HYDROGELS OF POLYVINYLALCOHOL AND PENICILLIUM CYCLOPIUM CELLS-PREPARATION AND SORPTION CAPACITY

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Objectives: The investigation aimed at immobilization of P. cyclopium cells in chemically crosslinked poly(vinyl alcohol)