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April 25, 2024 (Thursday)
POSTER SESSION (4)
Venue: Conference Room "Pirineus"
Session Chair: Prof. Dr. P. S. Sandhu
Time: 9:45 am - 10:15 am

Paper Id	Registered Author and Affiliation*	Paper Title	Authors
H0424102	Geraldo Abranches Mota Batista Assistant Professor, PUC MINAS University, Brazil	The Importance of the Project Management Method in the Implementation of Technological Innovations in the Health Area Held at the CAIS Institution - Service and Social Inclusion CAIS	Bruna Cristina de Souza, Cristina Abranches Mota Batista, PhD, Geraldo Abranches Mota Batista
H0424118	Prof. Kristina Markovic, D.Sc. University of Rijeka, Faculty of Engineering, Vukovarska 58, 51000 Rijeka, Croatia	Experimental Determination of Rotational Pivot Behaviour	Kristina Marković, Maja Dundović, Željko Vrcan and Marina Franulović
H0424208	Gheorghe Stefania PhD, National Research and Development Institute for Industrial Ecology – ECOIND, Control Pollution Department, 57-73 Drumul Podu Dambovitel, Sector 6, 060652, Bucharest, Romania	Effects of Chronic Exposure of Polyethylene on Common Carp (<i>Cyprinus Carpio</i>) and the Impact on Enzymatic Biomarkers	Stefania Gheorghe, Stoica Catalina, Anca Maria Harabagiu, Laura Novac, Alina Banciu, Dorian Neidoni
H0424209	Dr. Catalina STOICA Research Scientist, National Research and Development Institute for Industrial Ecology-ECOIND, Bucharest, Romania	Monitoring the Microplastics Impact on <i>Cyprinus Carpio</i> by Biomarkers Expression at Translational Level	Catalina Stoica, Stefania Gheorghe, Alina Roxana Banciu, Mihai Nita-Lazar

Monitoring The Microplastics Impact on *Cyprinus Carpio* by Biomarkers Expression at Translational Level

Catalina Stoica¹, Stefania Gheorghe¹, Alina Roxana Banciu¹ and Mihai Nita-Lazar^{1*}

¹National Research and Development Institute for Industrial Ecology-ECOIND, 57-73 Drumul Podu Dambovitei, 060652, Bucharest, Romania

*Correspondence Author: mihai.nita@incdecoind.ro

Abstract: Nowadays, aquatic environment contamination with microplastics has become a major global challenge of society. As most of pollutants, microplastics release into the aquatic ecosystems could have harmful effects on living organisms at all trophic levels. The broad range of microplastics effects on aquatic system biota triggered a significant interest for ecotoxicological studies as an indicator of aquatic organisms' stress and adaptation features. Our study was conducted on common carp, *Cyprinus carpio*, due to its economic importance in the Romanian food market. The selected fish biological model was in vitro grown in presence of polyethylene (PE) and polystyrene (PS) microplastics. The effect of PE (40, 48 and 125 μm) and a mixture of PS (20, 200 and 430 μm) on common carp was evaluated after 75 days by analyzing their proteic profile. No mortality or behavior changes were recorded during experimental chronic exposure period. The results showed that PS, PE of 40-48 μm and PE of 125 μm induced in carp gills the expression of 85 kDa, 60 kDa and 10kDa proteins. PE of 40-48 μm induced protein expression of 60 kDa in fish intestine samples, as in case of gills, while PS generated a different profile in liver, especially of 65 kDa proteins. In this case, the liver proved to have increased resilience to microplastics, which is consistent with its role as a detoxifier. Overall, could modulate specific protein expression linked to different fish organs.

Keywords: Chronic Tests, Biomarkers, *Cyprinus Carpio*, Microplastics

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Effects of Chronic Exposure of Polyethylene on Common Carp (*Cyprinus Carpio*) and the Impact on Enzymatic Biomarkers

Stefania Gheorghe¹, Stoica Catalina¹, Anca Maria Harabagiu¹, Laura Feodorov¹,
Alina Banciu¹ and Dorian Neidoni²

¹National Research and Development Institute for Industrial Ecology – ECOIND,
Control Pollution Department, 57-73 Drumul Podu Dambovitei, Sector 6, 060652,
Bucharest, Romania, stefania.gheorghe@incdecoind.ro

²National Research and Development Institute for Industrial Ecology—ECOIND,
Bujorilor Street, 115, Timis District, 300431 Timisoasa, Romania; dorian.neidoni@ecoind.ro

Abstract: Global plastic consumption has led to an increased and persistent microplastic pollution in aquatic environments. Due to their physical properties, plastic particles are omnipresent and are affecting aquatic biota. The aim of the study was to evaluate the effects of long-term exposure (75 days) to polyethylene (PE) on the development, oxidative stress indicators, neurotoxicity, and reproduction in carp (*Cyprinus carpio*). PE is a synthetic polymer and one of the most widely used plastics. Its presence in the environment endangers the health of aquatic organisms. Laboratory investigations involved evaluating PE toxicity with two different particle sizes (40-48 μm and 125 μm , 0.6 mg/L for each type) using OECD no. 305 in a semi-static system. No mortality or behavioral changes were recorded at the end of the test. PE showed bioavailability mainly through ingestion with food, causing weight loss of fish, especially in the case of PE 125 μm . At the end of the exposure period, organs were collected for sub-lethal effects investigations. PE induced oxidative stress in fish organs. A significant increase in the activity of catalase (CAT) and glutathione reductase (GRED) enzymes correlated with lipid peroxidation in the gills was observed. In the liver, increased CAT and glutathione S-transferase (GST) activity occurred without lipid peroxidation effects. Additionally, alanine transferase and aspartate transferase activities showed significant changes, especially in the case of PE 40-48 μm . Vitellogenin (VTG) activity in the liver increased by 10% for PE 40-48 μm and by 80% in the case of PE 125 μm . Low levels of VTG were observed in the gonads. EROD (ethoxyresorufin-o-deethylase) and acetylcholinesterase were inhibited, especially in the case of PE 125 μm . The size of the particle influenced the level of effects but also the target organs. For example, PE 40-48 affected the gills, liver, and intestine through the increased expression of stress enzymes, while PE 125 could cause effects on the liver, intestine, gills, kidneys, gonads, and brain by inhibiting antioxidant enzymes.

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Keywords: Microplastics, Polyethylene, Oxidative Stress, Fish