

Journal of Biological Research

Bollettino della Società Italiana di Biologia Sperimentale



**Primo simposio di Biologia Sperimentale
applicata al mare e all'ambiente**

*First symposium on experimental biology:
sea and environment*

Trapani, Italy, 24-25 May 2019

ABSTRACT BOOK

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the mussel *Mytilus galloprovincialis*. The main objective of the study was to assess the acute effects of Thiacloprid and Calypso on *M. galloprovincialis*. Mussels were exposed for 7 days to three different concentrations of these products (Thiacloprid: 1 mg/L; 5 mg/L; 10 mg/L; Calypso: 10 mg/L; 50 mg/L; 100 mg/L). The following biomarkers were then measured: cell vitality in haemocytes and digestive cells; antioxidant parameters, superoxide dismutase and catalase, in mussel digestive gland. Both the pure neonicotinoid and the Calypso showed the same mode of action. In fact, after acute exposure to the high concentrations, both cell lines maintained viability. As for antioxidant enzymes, activity of SOD and CAT showed significant ($p < 0.05$) changes during the exposures to both substances, compared to controls. The results showed that these neonicotinoids, which alter physiological processes in evolutionarily more complex organisms, do not create obvious damage after acute exposure to *M. galloprovincialis*. In any case, results obtained do not exclude the possibility of more relevant damage following chronic exposure to pesticides.

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SYNERGIC EFFECT OF TOXICANT MIXTURE (CARBAMAZEPINE, CADMIUM CHLORIDE AND POLYBROMINATED DIPHENYL ETHER) IN MARINE FISH CELL LINE SAF-1

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It is a fact that human and their environments are exposed to a wide range of contaminants. Several compounds have been found in sea water worldwide, like industry sub-products (as heavy metals, halogens...), plastics (microplastics, flame retardants...), or diverse pharmaceutical metabolites (paracetamol, atenolol, carbamazepine...). Although these elements are found at concentrations might be considered as sub-lethal, there is increasing concern about the potential adverse effects of the interactions between those substances when present simultaneously in a mixture. Under certain conditions, chemicals will act jointly in a way that the overall level of toxicity could be affected. To shed light into this issue, the cell line from fibroblast of *Sparus aurata* SAF-1 was exposed to increasing concentrations of carbamazepine (CBZ), polybrominated diphenyl ether 47 (BDE-47) and cadmium chloride (CdCl_2), until 72 h to evaluate the cytotoxicity and the expression of relevant genes (antioxidant defence, cell cycle and energetic balance) by real-time PCR. In general, both vitality and gene expression were affected by the exposure to the different toxicants, affecting the antioxidant defence and producing cell cycle disruption, showing the higher effects in the cells exposed to the toxicant mixture of three compounds. The continue exposure to the different mixture of contaminants severally increase the negative effects that produce the same compounds separately, increasing its toxicity and

increase the impact of contaminants on health from marine organisms.

PLASTIC DEBRIS INGESTION BY DEMERSAL ELASMOBRANCH SPECIES FROM TYRRHENIAN SEA: *GALEUS MELASTOMUS*, *SCYLIORHINUS CANICULA* AND *RAJA MIRALETUS*

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In recent years, based on the plastic feature, many techniques have been optimised to the mass production for a large scale of different plastic materials. Despite the international laws regulate the plastic debris entering in the marine environment, up to 10% of plastic produced reaches the oceans where increase in concentrations and spread beyond all limits. In this study, three elasmobranch species have been considered: *Galeus melastomus*, *Scyliorhinus canicula* and *Raja miraletus*. The specimens were collected during May/June 2017 in the southernmost part of the Tyrrhenian Sea. A total of 88 specimens were sampled and the Gastrointestinal Tracts (GIT) were analysed using visual sorting under fume hood to prevent atmospheric contamination. The study confirmed the presence of plastic microfibers, macrofibers and macrofragment in all the three demersal elasmobranch species. Plastic particles extracted from GITs were black, white and red. In all, 21 plastic particles were found as follow: 6 in *G. melastomus*, 13 in *S. canicula* and 2 in *R. miraletus*. Thanks to Attenuated Total Reflectance Fourier Transform Infrared (ATR-FTIR) and micro-Raman spectroscopies, the composition analysis of plastic particles were performed. Results showed the presence of PA and PE (50% for both) in *G. melastomus*, PP (71.4 %), PTFE and CA (both 14.20%) for *S. canicula* and only kraton G in *R. miraletus*. Results reflected both primary and secondary uptake of litter in accord to the feeding habits of elasmobranchs studied.

PLASTICS INGESTION EVIDENCES IN TWO COMMERCIALLY IMPORTANT SPECIES FROM CENTRAL MEDITERRANEAN SEA

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Plastics and microplastics (MPs) pollution is an emerging