Ecotoxicological screening on a ENPs pool: responses of different marine organisms and end-points.

F. Garaventa[1], M. Faimali[2], V. Piazza[2], T. Mesaric[3], K. Sepcic[3], A. Fabbrocini[4], C. Gambardella[5]

[1] CNR – ISMAR, Arsenale - Tesa 104, Castello 2737/F, 30122 Venezia, Italy; [2] CNR – ISMAR, Via De Marini,6 - 16149 – Genova, Italy; [3] Department of Biology, Biotechnical faculty, University of Ljubljana, Slovenia; [4] CNR – ISMAR, Via Pola 4 - 71010 Lesina (FG), Italy; [5] DISTAV, University of Genova, Viale Benedetto XV 5 - 16132 Genova, Italy

francesca.garaventa@ismar.cnr.it

Nowadays, most of existing data about aquatic toxicity of Engineered Nanoparticles (ENPs) concern freshwater environment [1, 2]. The aim of this study was to contribute to fill this gap to more fully assess the effect of a panel of ENPs on different marine organisms. Organisms have been exposed to serial concentrations of ENPs: SiO_2, Ag, TiO_2, Fullerene (C-60), Carbon black and Graphene Oxide.

In particular, Echinoderms (*Paracentrotus lividus*) and crustaceans (*Amphibalanus amphitrite* and *Artemia salina*) were exposed to the whole panel of ENPs; in addiction, the effect of Silver ENPs have been investigated also on Algae (*Dunaliella tertiolecta* and *Skeletonema costatum*) and Cnidaria (*Aurelia aurita*).

In order to asses ENPs effect different end-points have been evaluated: algal growth inhibition, sea urchin sperm motility, jellyfish mortality, crustaceans mortality and swimming behaviour alteration.

The results show that the investigated ENPs have different effects on the tested organisms. In particular, SiO_2 and TiO_2 showed any toxic effect on the tested organisms. On the contrary, Fullerene, Carbon Black and Graphene Oxide caused a measurable toxic effect on sea urchin and crustaceans.

Finally, considering the results obtained exposing Silver ENPs to a wider battery of organisms, it was possible to point out that all the investigated end-points were able to underline a dose-dependent effect caused by Silver ENPs. For each end-point it was possible to quantify this effect by means of LC_{50}, IC_{50} and EC_{50}. The results obtained, in particular those with Silver NPs, suggest that ENPs' exposure can influence different trophic levels within the marine ecosystem, displaying dose-dependent effect on all the tested organisms.

References:

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