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Abstract Title:

Integrated molecular approach in *C. fluminea* exposed to nCeO₂: a mesocosm study

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Abstract:

Nanotechnology interest has considerably grown during last decades and nanoproducts are now part of our everyday life. Nanoparticle (NP) concentrations in environment are not yet known but releases during their life cycle are an evidence. NP harmful effects have already been demonstrated on aquatic species but their potential toxicity at more realistic low exposure concentration is still not well studied. Cerium dioxide nanoparticles (nCeO₂) are listed in OECD priority list of manufactured nanomaterials for their assessment because of their large production making them available for widespread uses in daily products. One important utilization occurs via their incorporation in diesel fuel additive due to their oxidative capacities making them useful to reduce fuel consumption, improving its combustion and reducing soot in exhaust gas. Several studies highlighted that nCeO₂ impact organism's physiology by affecting oxidative defenses and cellular membrane stability while gene expression studies remain scarce especially among non-sequenced organisms.

The aim of this work was to follow gene expression in a widespread freshwater bivalve, *Corbicula fluminea*, exposed in indoor mesocosm to multistress conditions. Two salinities (1.5 and 15 PSU) were applied to cover a range of salinity from the continent to the estuaries and three NPs were selected in order to have both standardized and commercial NPs but also to mimic changes occurring after NP uses. Two studies were done on variation of 12 gene expression by RT-qPCR in gills and digestive gland according to the exposure conditions and time. First, a comparison of these 12 genes basal expression level in control gills and digestive gland was done and revealed strong differences of expression level (>2 fold) for some genes. The second study was about global profile of gene expression responses according to salinity and contamination. They are clearly different according to the salinity and both organs selected were responding to NP contamination. Results obtained for NPs extracted from commercial product have highlighted the need of further studies using consumer available NPs.