

MOLECULAR MARKERS FOR CHRONIC TOXICITY OF MARINE POLLUTANTS IN NORTH SEA BROWN SHRIMP (*CRANGON CRANGON L.*)

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Through its high abundance and high annual production, the common shrimp *Crangon crangon* L. (Crustacea; Decapoda; Caridea) exhibits a major influence on the benthic community structure in the North Sea and the European coastal waters. Furthermore, *C. crangon* is an economically important species. During mid-1950 to 1990 however, the annual catch decreased dramatically (FAO, 2008). While this trend is attributed to overfishing, it seems to coincide with the post-war large-scale application of several endocrine disrupting chemicals (EDC's, e.g. pesticides as DDT). While *C. crangon* is commonly used in seasonal field monitoring of ecosystem status and EDC concentrations, little ecotoxicological research has focussed on *C. crangon*, rendering any correlation between pollution load and ecologic effects impossible. Our first aim is to investigate the interference of three ubiquitous environmental contaminants (TBT, PFOS and BDE47) in *C. crangon* ecdysteroid signalling, a major invertebrate hormonal axis which is known to be very sensitive towards EDC's. This will be achieved by *in vitro* luciferase reporter assays, that allows quantification of pollutant dependent activity of the heterodimeric CrcEcR-CrcRXR ecdysteroid receptor. Our second aim is to investigate the EDC dependent expression of a broad range of *C. crangon* genes, in order to obtain a distinct set of biomarkers. This set should render an extensive image of single pollutant effects on laboratory exposed shrimp. Sublethal effects in natural shrimp populations, which experience complex combinations of pollutants and abiotic conditions, can be assessed in a further stage. That aim will be achieved by analysing laboratory exposed shrimp with a microarray containing isolated gender-specific genes, obtained through subtraction-PCR.

References

FAO. 2008. Fishstat plus: Universal software for statistical time series. Food and Agriculture Organization of the United Nations, Rome, Italy. Electronic webpage <http://www.fao.org/fi/statist/FISOFT/FISHPLUS.asp>.