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ANALYSIS OF CHEMICAL WARFARE AGENT RELATED CHEMICALS IN *IN VIVO* EXPOSED MUSSELS

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ABSTRACT

CHEMSEA, Chemical Munitions Search and Assessment, has been a flagship project of the Baltic Sea Region Program partly financed by the European Union. The main focus of the project was to locate the dumped chemical warfare agents (CWAs) and sample the surrounding environment to assess the possible threat.

Ocean waters are in a constant flux, making the study of effect of CWAs on marine biota a challenging task. For the evaluation of the risks of dumped CWAs, triphenylarsine, sulphur mustard, Adamsite (DM) and Clark I (DA) are thought to pose the highest realistic risk to marine biota. The exact effects of these chemicals are not known and no information is available for the detoxification rates of CWAs in fish tissues or other marine organism, such as mussels.

Mussels were studied in both *in situ* caging experiments and *in vivo* exposure experiments. This paper focuses in *in vivo* experiments, in which mussels (*M. trossulus*) were exposed to mixtures of the arsenic-containing CWAs DA, DM and the tear gas α -chloroacetophenone (CN). The main aim was to evaluate uptake and biological responses in mussels after exposure to CWA mixtures at environmentally relevant concentrations.

The soft tissue of blue mussels from the laboratory exposure studies were studied. Analyses of CN were performed using combined gas chromatography–tandem mass spectrometry (GC–MS/MS). DM and DA were analysed as their oxidation products using liquid chromatography–tandem mass spectrometry (LC–MS/MS). The sample preparation for these analyses is laborious and contains homogenization, multiple extractions and filtration.

High concentrations of oxidized DM and DA were found in laboratory exposed mussels. Detailed results and conclusions will be discussed.

