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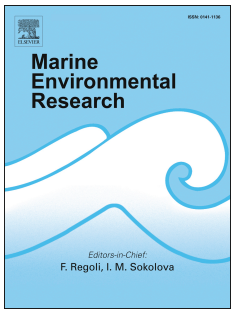


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# Comparison of caged and native blue mussels (*Mytilus edulis* spp.) for environmental monitoring of PAH, PCB and trace metals

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## Abstract

Contaminant bioaccumulation was studied in blue mussels (*Mytilus edulis* spp.) using the harbor waters of Kristiansand (Norway) as a case study. A suite of chemical contaminants (trace metals, PAHs and PCBs) was analyzed in caged and native mussels as well as in passive samplers (Diffusive Gradients in Thin films (DGT)-devices and silicone rubbers) placed alongside the mussels for estimation of contaminant concentrations in water and uptake rates and bioaccumulation factors (BAFs) in mussels during a six-months deployment period. Estimated logBAFs were in the ranges 2.3 - 5.5, 3.8 - 5.2 and 3.2 – 4.4 for metals, PCBs and PAHs, respectively. Contaminant levels in caged mussels increased rapidly to stable levels for trace metals, whereas for hydrophobic organic contaminants the increase was steady but slow and for many compounds did not reach the levels observed in native mussels. Some key issues related to mussel caging design, such as mussel deployment time and confounding influence from seasonal fluctuations, are discussed herein.

Keywords: blue mussels; biomonitoring; caging; contaminant bioaccumulation factors

## 1. Introduction

Blue mussels (*Mytilus* spp.) are widely used as sentinels in coastal pollution monitoring (mussel watch) programs, mainly because their biological characteristics make them very suitable as bioindicators for assessing the quality status of coastal waters (Farrington et al., 2016; Beyer et al., this volume). Most often mussel watch studies involve collection of samples from natural blue mussel populations, but the adoption of an active biomonitoring alternative by using transplanted blue mussel has gained considerable popularity in ecotoxicology research and monitoring. Indeed, the straightforwardness of using controlled deployments is one of the key advantages with blue mussels in