

DAIMON Toolbox Fact Sheets:

Methods to Study the Impact of Dumped Munitions on Marine Biota

Assessment category: Other approaches

Toolbox component: Lab toxicity studies

Fact Sheet 4.6: Fluorescence assay for the detection of the activity of ABC transporters in flatworms induced by toxicants

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What is it?

ABC transporters are present in all cells and expression and function are induced by the presence of toxicants in the surrounding water. This fluorescence assay measures the activity of the transporters using a reporter dye.

What does it tell you?

Differential expression of ABC transporters indicate the presence of toxicants at very low concentrations before any intoxication is visible. It is the first line defence of cells to xenobiotics which is induced at very low concentrations.

Type of Indicator (tick box)

- non-specific stress indicator
- specific for groups of contaminants incl. CWA or explosives
- CWA-specific indicator
- specific for substances related to explosives (e.g. TNT)

How to measure it?

Species: We used the marine flatworm *Macrostomum lignano*, which is easy to culture in the laboratory.

Matrix: Living undisturbed animals stained with a live imaging dye as Calcein am

Equipment: Fluorescence microscope with software to quantify fluorescence intensities with e.g. different filter settings

Measurements and units: Fluorescence intensity is measured and presented as arbitrary units in comparison to controls.

Sample size: 10 animal measured for each relevant toxicant concentration and control.

How to analyse and assess the data?

The data are measured using a fluorescence imaging software and calculated by the imaging software. Each statistics software can be used to analyse the data.

References

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