

The Effects of Phthalates on *Nereis diversicolor*

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Animals are exposed, in the natural environment, to a range of human activity related dissolved chemicals that are potentially impacting on their fitness. The animals responses to such stress determines its fitness, physiology and in case of chemical signals also its behaviour. If physical or chemical changes in the ecosystem make the detection of such a chemical impossible, then it can be reasonably assumed that vital behaviours of the animal will be significantly altered.

Plastics are lighter, more durable, stronger and cheaper than other materials used for the same purposes, making them most suitable for producing a very broad range of goods and products. However, these same properties also make them serious environmental hazards i.e. they are easily carried and dispersed by water over long distances, and stopped by barriers and settle in the form of sediments that can persist for centuries. Phthalate esters are widely used as additives to offer flexibility to polyvinyl chloride (PVC) resins (Graham, 1973). DEHP and DMP are the most frequently used plasticizer in PVC formulas in consumer products (Metcalf et al. 1973; Carnevali et al. 2010). In general phthalate esters harmful environmental and human health effects are well documented and a range of studies documented harmful effects on both land and aquatic organisms (Metcalf et al. 1973; Lithner, et al. 2009).

Neanthes (Nereis, Hediste) diversicolor is a bio-indicator species to monitor levels of pollution in a particular environment i.e. to by quantify levels of contaminant presents in the worms. Measuring these in *N. diversicolor* makes it possible to estimate and monitor levels of contamination in marine environments. The worms are easy to keep in laboratory conditions and can be collected in large numbers in the field and used as model species since the 1950s (Scaps, 2002).

The main aim of this study is to investigate and determine the fate of phthalates in a *Nereis* culture system and to assess the impact of phthalates upon fitness such as feeding behaviours. For this worms are exposed to different concentration of DEHP and DMP (0.05, 2, and 10 ug/mL) over short term (days) and long term (3months / lifespan).

The aim of short term of exposure was to determine the fate of phthalates in a *Nereis* culture system to examine if phthalate degradation takes place. GC-MS is used to measure the phthalates. Liquid: liquid extraction was used to extract phthalates from water and worm tissue whereas accelerated solvent extraction was used to extract phthalates from sediment. The aim of long term of exposure was to investigate and assess the impact of phthalates on animals' functional traits (feeding response).

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