ASSESSMENT OF AQUATIC TOXICITY WITH TETRAHYMENA PYRIFORMIS: ALTERNATIVES TO THE GROWTH IMPAIRMENT ASSAYS

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Ciliated protists fulfill all the requirements to be considered suitable test organisms for assessing environmental risk and impact and, among protists, the ciliate Tetrahymena *pyriformis*, is the most commonly ciliated model used for laboratory research and toxicity assessment.

Growth rate has been used in the evaluation of toxicity for some decades. Population growth impairment is an often-used sublethal toxic endpoint for organic and inorganic compounds, and do not require special technical expertise. It is considered the most sensitive sublethal parameter, reflecting the global state of a series of parcel effects.

Nevertheless, some limitations detected in such an assay can make it unsuitable with several toxicants. Recognising dead cells is sometimes ambiguous and it was found that light microscopy observations underestimated the true number of viable cells. Another problem that toxicologists must deal with is that conventional toxicological assays are often slow and labour-intensive, and become impractical when many compounds and/or concentrations are being tested rapidly. This has led to a greater interest in colorimetric and fluorimetric assays that can be miniaturised in 96-well microtitre plates and assessed using an ELISA spectrophotometric microtitre plate reader.

The acid phosphatase (ACP) activity was used as an indicator of the metabolic state of the cultures, namely of the intracellular digestive function, when the ciliates were exposed to toxicants. Morphological changes, based on morphometry have also given proofs in the assessment of toxicity with Tetrahymenapyriformis.

The question is: how do these tests reflect the inflicted toxicity of chemical compounds? The results of the present work contribute to such a discussion: morphometry and the determination of ACP activity were used to assess the toxicity in axenic cultures of Tetrahymena pyriformis and compared with the results of the growth impairment assay.