

OCS5: FREE THEME

Moderator: Piedade Barros (ESTSP.IPP)

OC18: Toxicity of formaldehyde alternative fixatives to ecological model organisms

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Introduction: Fixation is a fundamental and critical step in the preparation of tissue specimens for histological study since, if it is carried out under non optimal conditions, irreversible damage can occur and subsequent information obtainable from the specimen is compromised. Formaldehyde is the most common fixative in histology but due to its occupational and environmental toxicity, formalin substitute's fixatives have been developed. The toxic evaluations of these fixatives to environmental key species are still poorly studied.

Objectives: The purpose of this work was to study the toxicity of alternative fixatives, RCL2, FineFix and GreenFix to key environmental model species from marine, freshwater and terrestrial ecosystems.

Materials and Methods: The toxic effects of RCL2, FineFix and GreenFix were assessed with algal and cyanobacteria growth inhibition test conducted following the European Guideline OECD 201; with Test No. 202, *Daphnia sp.* acute immobilisation test and Test No. 211, *Daphnia magna* reproduction test; The test with marine *Artemia* was adapted from Ferreira, C., Nunes, B, Nunes, A., Almeida, J, Guilhermino, (2007). The toxicity to seed plants was assessed with the OECD Test No. 208, *Terrestrial plant test: Seedling emergence and seedling growth test*.

Results and Discussion: All the alternative fixative tested were less toxic than formaldehyde to all the species studied. FineFix was highly toxic to seed germination. Fine Fix was the less toxic to green algae and to freshwater and marine crustaceans. Cyanobacteria and *Lactuca* seeds had low sensitivity to GreenFix.

Conclusion: The different species both from fresh and marine water and from terrestrial ecosystems do not respond similarly to the fixatives tested. Comparing all the fixatives and all the species tested, GreenFix was the less toxic.

References

1. Ferreira, C.; Nunes, B.; Almeida, J.; Guilhermino, L. 2007. Acute toxicity of oxytetracycline and florfenicol to the microalgae *Tetraselmis chuii* and to the crustacean *Artemia parthenogenetica*. *Ecotoxicol Environ Saf.*;67(3):452-8.