

Title – Toxicological Assay of Chemical Resistant Polymers with a Zebra Fish Model

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Abstract:

The most common construction material in the world is wood. Be it furniture, houseware, boats, or houses, wood's organic structure leaves it susceptible to decomposition in means unknown to metals or other inorganic materials. To counter this, many carpenters cover their wood with lacquers, stains, and coatings that prevent rot, tarnish, and shine. However, many of these coats promise to resist more than the elements of nature, rather these claim to make the wood construct resistant to some chemical reactions. Though this is an incredible advantage given to the carpenter to craft works resistant to the ever changing consumer environment, it presents the question of the toxicology of these new stains.

To assess the potential threats these new compounds may pose to aquatic life in the scenario of these coatings being used on wooden boats, we conducted the following study: To simulate exposure of wood coatings in aquatic environments, 3"x6" wooden tickets of plywood were

coated with one of three of these chemical resistant polymer coatings with an untreated ticket for control. These treated tickets rested in tanks of zebrafish adults and were continuously monitored for adverse effect due to leeching of the coatings into the tanks. These adverse effects were quantified in a quantal manner. Further, to assess the potential developmental effects, zebrafish embryos are treated likewise to an E3 mineral solution that had been exposed to the same experimental tickets and a blank ticket for control. Each of these servings of E3 were the medium of development for the embryos and were assessed under microscope for developmental effects. Images of these effects were captured and attached in results.