

Abstract

Mercury chloride toxicity attenuation of the Brine Shrimp *Artemia Salina* after treatment with *Mercurius corrosivus* as isotherapeutic

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Isotherapeutics prepared from toxic substances have been described as attenuation factors for heavy metal intoxication in aquatic animals. Herein, *Artemia salina* and mercury chloride were used as a model to identify treatment-related bioresilience. The aim was to describe the effects of *Mercurius corrosivus* (MC) in different potencies on *Artemia salina* cyst hatching and on mercury bioavailability. *Artemia salina* cysts were exposed to 5.0 µg/mL of mercury chloride during the hatching phase. MC 6cH, 30cH, and 200cH were prepared and poured into artificial seawater. Different controls were used (nonchallenged cysts and challenged cysts treated with water, succussed water, and Ethilicum 1cH). Four series of nine experiments were performed for 4 weeks to evaluate the percentage of cyst hatching considering all moon phases. Soluble total mercury (THg) levels and precipitated mercury content were also evaluated. Solvatochromic dyes were used to check for eventual physicochemical markers of MC biological activity. Two-way analysis of variance (ANOVA) with mixed models was used for evaluating the effect of different treatments and the simultaneous influence of the moon phases on the cysts hatching rate, at both observation times (24 and 48 hours). When necessary, outliers were removed, using the Tukey criterion. The level of significance α was set at 5%. Significant delay ($p < 0.0001$) in cyst hatching was observed after treatment with MC 30cH, compared with the controls. An increase in THg concentration in seawater ($p < 0.0018$) and of chlorine/oxygen ratio ($p < 0.0001$) in suspended micro-aggregates was also seen, with possible relation with mercury bioavailability. Specific interaction of MC 30cH with the solvatochromic dye ET33 ($p < 0.0017$) was found. The other observed potencies of *Mercurius corrosivus* 6 and 200 cH were not significant in relation to the observed groups. The results were postulated as being protective effects of MC 30cH on *Artemia salina*, by improving its bioresilience.

Keywords: Mercury, Brine shrimp, Homeopathy, Ecotoxicology

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