

P024 Crystal phase and illumination condition influence sublethal effects of nano-TiO₂

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Notes:

Previous study of our group showed that the acute co-exposure of fish to nano-TiO₂ and ultraviolet radiation influence the occurrence of sublethal effects. The aim of this work was to evaluate the effects on fish exposed to different nano-TiO₂ formulation and illumination conditions during a prolonged period.

Fish (*Piaractus mesopotamicus*) were exposed during 21 days to two different formulation of nano-TiO₂ at 100 mg/L: TA (Sigma Aldrich, 100% anatase, 25 nm) and TM (Aeroxide P25 Evonik, 20% rutile, 80% anatase, 25 nm). Both TiO₂ exposure and respective controls were performed under two types of illumination: visible light without and with ultraviolet radiation at environmental levels (UVA and B, 22.47 J/cm²/h). Protein carbonylation (PCO), and the specific activities of catalase (CAT) and glutathione s-transferase (GST) were analyzed in liver. Comet assay was performed in blood.

There was no fish mortality in any group. Exposure to TA without UV showed an increase in CAT, PCO and in the score of genetic damage. TM without UV showed an increase in GST. The co-exposure to TM and UV kept GST elevated, and showed also an increase in PCO and genetic damage.

Our results showed low toxicity of nano-TiO₂ in fish corroborating with literature data. However, they showed an influence of nano-TiO₂ formulation/crystal phase and illumination in the sublethal effects. In the meantime TA showed more biochemical effects without co-exposure to UV, TM showed more sublethal effects with UV. Supported by: FAPESP, CNPq, CAPES, Fundunesp and Embrapa.