



Zinc Oxide (ZnO) nanoparticles toxic potency on different microalgae species

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Nanoparticles are widely used in many products such as cosmetics, material coatings, and pigments and they are released into environment. Recently, nanoparticles have been found in municipal wastewater and wastewater treatment plants, which are consequently discharged to receiving bodies. Since their versatile use and application is increasing, their environmental impact is of great concern and needs to be clarified. The aim of this work was to investigate the effect of nanoparticles on aquatic species, such as unicellular microalgae. This is considered as a necessary step in order to assess their impact on coastal food chain and the ecosystems that they support as well as on natural wastewater treatment systems. More specifically, the potential toxic effects of ZnO nanoparticles (ZnO NPs) on three aquatic organisms, *Dunaliella tertiolecta*, *Tetraselmis suecica*, and *Chlorococcum* sp. were investigated. The microalgae species exposed to different periods of time (24, 48, 72 and 96 h) and different concentrations of ZnO NPs (1 to 100 μ M, 1 to 10 mM), and showed significant differences on their growth rates. Algae exposed to ZnO NPs concentrations from 1 to 100 μ exhibited increased levels of the half maximum inhibitory concentration values (IC50) in all cases, while at higher concentrations (from 1 to 10 mM) algae showed excessive lysis, probably due to disturbances occurred in cellular structure and function. According to the results of the present study, ZnO nanoparticles appeared to have toxic effects on all species tested, showing type- and time-dependent alterations.