



Effect of culture medium on toxic effect of ZnO nanoparticles to freshwater microalgae

Andriana F. Aravantinou (1), Vasiliki Tsarpali (2), Stefanos Dailianis (2), and Ioannis D. Manariotis (1)

(1) Department of Civil Engineering, University of Patras, 265 04 Patras, Greece (idman@upatras.gr, +302610996573), (2) Section of Animal Biology, Department of Biology, Faculty of Sciences, University of Patras, 26504, Greece

The widely use of nanoparticles (NPs) in many products, is increasing over time. The release of NPs into the environment may affect ecosystems, and therefore it is essential to study their impact on aquatic organisms. The aim of this work was to investigate the effect of zinc oxide (ZnO) NPs on microalgae, cultured in different mediums. *Chlorococcum* sp. and *Scenedesmus rubescens* were used as freshwater microalgae model species in order to investigate the toxic effects of ZnO NPs. Microalgae species exposed to ZnO NPs concentrations varying from 0.081 to 810 mg/L for different periods of time (24 to 96 h) and two different culture mediums. The aggregation level and particle size distribution of NPs were also determined during the experiments. The experimental results revealed significant differences on algae growth rates depending on the selected culture medium. Specifically, the toxic effect of ZnO NPs in *Chlorococcum* sp. was higher in cultures with 1/3N BG-11 medium than in BBM medium, despite the fact that the dissolved zinc concentration was higher in BBM medium. On the other hand, *Scenedesmus rubescens* exhibited the exact opposite behavior, with the highest toxic effect in cultures with BBM medium. Both species growth was significantly affected by the exposure time, the NPs concentrations, and mainly the culture medium.