

IMPACT OF DIFFERENT CONCENTRATIONS OF ZINC AND CADMIUM CHLORIDE ON MICRO ALGAE *CHROOCOCCUS MINUTUS*

Mohammed G. Battah

*Botany Department, Faculty of Science Benha University, Egypt.
E. Mail: maamay@yahoo.com*

Presented at The Chemistry and Industrial Development Symposium, Sana'a 2005, Yemen.

ABSTRACT

Results are presented to demonstrate the effects of different concentrations of Zinc and Cadmium chloride ($ZnCl_2$ and $CdCl_2$) on one of the Cyanophyta "*Chroococcus minutus*" isolated from ponds in Sana'a Yemen. The two heavy metals adversely affected cell division; however the protein and glucose contents of the cells were little affected. They caused destruction of chlorophyll "a" as the result obtained by measuring the optical density and the chlorophyll content. These observations were interpreted in terms of the action of metals on the reduction and oxidation steps in the biosynthesis pathway of pigments.

INTRODUCTION

Recent attention has focused on the biological response to conditions of heavy metals stress in natural waters and cultivated soils. Algae are widely used as indicators of toxic substances, including metals in natural waters (Chiaudari and Vighi 1978; Bringmann and Kühn 1978). Knauer *et al.* (1997) studied the growth of algae that indicate a high tolerance toward high cells may immobilize the metals intracellular. Toxic metals increased the lag phase of *Chlamydomonas variabilis* and lowered the growth rate of *Euglena gracilis* (Bonaly *et al.*, 1978). The study of algal-metal ion interactions is of particular importance, principally because the algae and other simple plants are the basic of food chain. The interest in the interactions between microorganisms and metal ions dissolved in aqueous is a long-standing one. With regard to the growth of algae subjected to heavy metal stress, some workers clarified this phenomenon (Rachlin and Farran, 1974; Kogan *et al.*, 1975; Rosko and Rachlin, 1977; Petriya, 1978 and De Filippis *et al.*, 1981).

The impact of chromium on heterotrophic bacteria and photosynthetic microorganisms by Viti and Givannetti (2001) showed that a chronic high concentration of chromium in soil affected both oxygenic photosynthetic microorganisms and heterotrophic bacteria, in the soil with low chromium levels, *Nostoc* dominated and possessed numerous heterocysts.

This investigation is an endeavor to elucidate the stressing effects of various concentrations of zinc and cadmium upon the growth criteria of one organism that is common fresh water phytoplankton, this organism is *Chroococcus minutus* as a unicellular Cyanophyta in order to compare and contrast the tolerance to and role of these elements in