

## Ability of Two Algae to Accumulate Divalent Cations under Non - Growth Conditions

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A study is reported of the ability of *Anabaena variabilis* and *Chlorella pyrenoidosa* to accumulate divalent cations under non-growth conditions. Various cations can be readily accumulated by both species. The rate of accumulation differed and, for most cations, the accumulation rate was time dependent and in some cases concentration one.

The order of metal affinity to algal surface revealed that  $Ca^{2+}$  was essential for both organisms at the concentrations of 2 ppm and 4 ppm followed by  $Zn^{2+}$  especially at the slightly low concentration. Cadmium represents the least cation taken by both organisms, since both organisms are unable to uptake the cations intracellularly. This process was actually time dependent. Such result explains that cadmium is toxic cation. Lead was taken with higher rate by *Chlorella* than by *Anabaena*. Moreover, lead was highly associated with cell wall surface in case of *Chlorella* especially at 4 ppm after 3 days of exposure. These results indicate that *Chlorella*, has the ability to make detoxification process in a different manner as compared with *Anabaena*.

**Keywords:** *Anabaena variabilis*, *Chlorella pyrenoidosa*, Cations accumulation by algae, Divalent cations in algae zinc, Calcium cadmium in algae, Metal accumulation in Algae, Physiology of non - growing algae .

In aquatic environment, algae play an important role as removers of some polluting agents. Heavy metals like zinc, copper, cadmium and lead are well known water pollutants (Fayed *et al.*, 1983). The continuous input of these pollutants into aquatic environment has harmful effects on