Gravitactic Effects of Copper Pollution on Glucose Metabolism in Euglena gracilis

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Euglena gracilis is a very important part of the marine environment, providing food for many organisms in a similar way phytoplankton does. The organism also has many additional dietary uses and nutritional value for humans. Copper pollution in the Monterey Bay and other local water sources threaten this protist, along with many other organisms, in ways that have not been appropriately studied, especially upon the organisms' ability to heterotrophically utilize glucose as a food source. In this project the effect of copper induced gravitactic disturbance on glucose metabolism was observed. I hypothesized that gravitactic agitation would lead to a decrease in glucose metabolism, resulting in reduced biomass and cell size. E. gracilis was incubated in two batches CB (Copper Bath) and NC (Neutral Control), in media containing glucose (TMglu), medium containing no organic carbon source (TMnoc), glucose and copper (TMglc), and copper (TMcop). CB tests included a primary copper wash. Glucose metabolism was adversely affected by the addition of copper with an initial decrease in TMglc. TMnoc was found to have a median biomass in comparison to other samples. The results show that copper is impairing Euglena's ability to metabolize glucose, but once the Euglena is allowed to recover, metabolism is significantly higher than the normal rate. Copper pollution will continue to threaten the viability of this organism as a food source for marine organisms, but if there is a need to culture the Euglena for human dietary needs, the Euglena will be able to recover from copper impaired metabolism.

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