

An Assessment of Algal Communities and the Impact of Ionic Stress on Algal Cells from Streams Impaired by Acid Mine Drainage

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Abstract. Algae are often bioindicators due to their wide range of habitats, high biodiversity, and sensitivity to anthropogenic influence. Streams impacted by acid mine drainage (AMD) are characterized by low alkalinity, high conductivity, low pH levels (e.g., < 3) and a high concentration of dissolved metal ions, all of which can cause changes in the algal community composition. Samples were collected in a previous study of AMD impacts on diatom species composition. The samples were taken from streams located in the Western Allegheny Plateau of southeast Ohio that suffer from impairment caused by AMD. We studied the physiology of algal cells under ionic stress and other algal assemblages. A standard protocol was used to identify 300 live algal units to the lowest taxonomic level possible. Dead algal units and associated cells were not included in the 300 unit cell count. About 80% of algae in the samples were diatoms, followed by green algae. High nutrient representatives from genera like *Gomphonema*, *Cymbella*, and *Navicula* were abundant. About 75% of algae in samples were alive. Morphological alterations in diatoms and chrysophyte spores were recorded and analyzed.