

## Abstract:

A study was carried out to find out if leaf extracts from different plants could be used to reduce the toxic effects of aluminum on fish. The types of leaves were pine, oak, sweet gum, willow, alligator grass, pecan and pine. Shiners (*Notropis*) fish were used for the study.

The results obtained showed that if the pH was controlled to pH 4.5 the presence of leaf extracts did not mitigate the toxic effect of aluminum. However at pH 5 and above the presence of leaf extracts reduced aluminum toxicity to fish.

When dried leaf extract was added to aluminum solution at pH 4.5 the final pH increased to 6.2 depending on the type of leaves. With no adjustment back to pH 4.5 the toxic effect of aluminum was greatly reduced except when pine or oak were used.

1. The presence of humic and fulvic acids in the leaf extracts were ascertained by the ratio of their absorbances at 465 nm and 665 nm. The results indicated that the presence of humic or fulvic acids depended on type of leaves and the length of time the leaves were soaked in water. Longer soaking resulted in increased formation of humic acid while shorter soaking resulted mostly in the formation of fulvic acids. Pine leaves showed very little tendency to form fulvic or humic acid even after soaking for a year.

Fluorescence studies obtained showed that there was an increased in the intensity of fluorescence and a shift in the shorter wavelength upon addition of aluminum to leaf extracts indicating a chemical reaction. The wavelength of the emission maxima corresponded to that of humic and fulvic acids.