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# The Effects of Leaf Tannin Concentration on Water Quality

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## **The effects of leaf tannin concentration on water quality**

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The leaves that fall from trees during the fall and winter seasons can change the quality of the water in natural ponds. Leaves retain secondary compounds called tannins, which function to protect plants from pathogens and herbivores. Tannins can potentially affect the development of aquatic organisms by altering the water quality, such as pH and dissolved oxygen. To evaluate how tannin concentration affects water pH and dissolved oxygen concentration, we used four different tree species: Chinese Tallow, Water Oak, Southern Magnolia, and Red Mulberry. For each species, we measured out three different quantities of ground and whole leaf samples and soaked them in 600mL of water. After soaking the leaves for three days, the tannin concentration, pH and dissolved oxygen concentration were measured for each water sample. Tannin concentrations were variable among the tree species. With increased tannin concentrations, there was a decrease in both water pH and dissolved oxygen concentration. While tannin concentration had little effect on the variability of the pH, it had substantial effect on the dissolved oxygen concentration. Reduced dissolved oxygen concentrations can be detrimental to aquatic life by reducing survival and growth. Low dissolved oxygen concentrations can also force organisms that can survive in low oxygen conditions to expend more energy to obtain oxygen. As such, leaves with high tannin concentrations may negatively affect pond organisms by lowering oxygen concentrations.