

Assessing Air Pollution with Spanish Moss as a Bioindicator in the Low Country of Savannah River Basin

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Spanish moss (*Tillandsia usneoides*) is an epiphytic bromeliad that grows naturally in tropic and subtropic climates. It is found natively growing in the low country of the Savannah River Basin. Epiphytic plants grow on the surface of larger plants such as trees and obtain their nutrients and water from the air around them. Due to their epiphytic nature, the elemental composition of Spanish moss reflects the air quality from its surrounding environment, which makes Spanish moss an ideal candidate for use as a bio-indicator of local air pollution. In this study, Spanish moss samples were collected along the Savannah River, near industrial sites and a superfund site from Aiken, SC to Savannah, GA, in order to seek the relationship of heavy metals in the Spanish moss and the air pollution in the low country of the Savannah River Basin.

The samples were dried and ground into a fine powder then studied systematically by instrumental neutron activation analysis (INAA). After the samples were irradiated with thermal and epithermal neutrons from a research reactor, all the short-lived and long-lived isotopes spectra were collected with HPGe spectrometers. The preliminary results indicate that: (1) INAA can determine the level of elements in Spanish moss with high accuracy and extreme sensitivity. It is an appropriate tool for conducting multi-element analysis in biological samples; (2) The concentrations of heavy metals in the samples have clear correlations with the pollution sources in the Savannah River area, which proves that Spanish moss can serve as an efficient bioindicator of air pollution.