# Reconstruction of Pleistocene history of metal pollution in a natural swamp using $^{210}Pb$ geochronometer

**K. H. Kim**

**D. S. Moon**

**J. S. Yang**

We report detailed profiles of $^{210}Pb$ and $^{137}Cs$ activities in a sediment core collected from Woopo Swamp, a 20 $km^2$-wide Pleistocene marshland in southern part of Korea. Activities of the two radionuclides were measured by non-destructive gamma spectroscopy utilizing a high-purity germanium detector. Since the bottom sediments of the swamp were highly anoxic with very high organic content derived from flourishing aquatic plants, no indication of biological particle mixing was recognized in the core. The excess $^{210}Pb$ activities showed an exponential decrease with depth as in the case of organic carbon content. A least-squares best-fit line drawn to the excess $^{210}Pb$ data points yielded a sedimentation rate of $0.44\pm0.04$ $cm.yr^{-1}$. This estimated rate was in a good agreement with the result from another stratigraphic marker, the depth of $^{137}Cs$ peak occurring around 15 cm below the surface. Fifteen elements including Al, As, Ba, Ca, Cd, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Sr, Ti and Zn were determined as well in the same core by inductively coupled plasma atomic emission spectroscopy. They were classified into 3 groups: volatile (As, Cd, Hg, Ni, Pb), refractory (Al, Ba, Ca, Sr, Ti), and diagenetic groups (Cr, Cu, Fe, Mn, Zn). The concentrations of the refractory elements have remained relatively constant with time for last 160 years. On the contrary, the volatile and diagenetic elements showed increase since the beginning of the 20th century. The steep increase of volatile elements in swamp sediments may be due to the anthropogenic input associated with the population growth in Korea.