^{210}Po and ^{210}Pb disequilibrium in mangrove coastal water and sediment

Y. Tateda

Y. Ikeda

K. Fukami

K. Kurosawa

^{210}Po concentrations in oligotrophic open water are generally controlled by density and size of zooplankton of high ^{210}Po affinity, because the rate of ^{210}Po removal from surface water is coincided with downward transport fluxes of ^{210}Po-rich biogenic debris originated to zooplankton. Thus the ^{210}Po levels in oligotrophic water are good index of zooplankton density and grazing activity in open waters. However, in coastal area, ^{210}Po is sometimes reported to be excess than ^{210}Pb, which ascribed to be the release from coastal sediment. In low latitude area of pacific ocean, the coastal area is mostly covered with coral reefs and mangroves, and the mangrove could be the significant ^{210}Po source because of its high organic and inorganic matter discharges. Briefly, the ^{210}Po and ^{210}Pb concentrations in mangrove coastal water are expected to be controlled by atmospheric deposition flux, in- and out-flux along with tidal water exchange, input flux originated from oxic-anoxic environment change of sediment, and from organic matter decomposition by heterotrophic benthos. To clarify the significant source of these nuclides, we analyzed the ^{210}Po and ^{210}Pb concentrations in coastal water and sediment of mangrove area at Fukidou River in Ishigaki Island Japan. By flux estimation, we estimate the balance of ^{210}Po and ^{210}Pb in the water column in and around the mangrove area and discuss the relation between these nuclides and other environmental component. The result indicated that the mangrove area is the source of ^{210}Po in coastal waters, and the organic matter decomposition or benthic biota activities are suggested to be important sources of ^{210}Po in mangrove area.