

Geochemical and lead isotope composition of the sediments in the Gangkou River catchment, Taiwan

HUNG-CHUN CHAO

Department of Earth and Environmental Sciences, National
Chung Cheng University

Sediment geochemistry and lead isotopes have been widely used to identify the source of the sediments delivered from catchment to the deposition basin. In this study, bed load sediments, terrace soils, beach sediments, and cores drilled at estuary were collected at the catchment of Gangkou River and its tributary, Linlu River, southern Taiwan. All sediments were sieved by 0.062 μm sifter and exchangeable, carbonate, and iron oxide phases were leached and the residue silicate phase were digested. Chemical composition, rare earth elements (REEs), and lead isotopes were measured. The results show that two major catchments, Linlu River and Gangkou River, as well as beach sediments can be successfully classified by lead isotopes. REEs show signature of upper continental crust and no differences among all the samples, possibly due to the same source of high REEs minerals. The characteristic of chemical composition shows no clear separation of two catchments. The result of lead isotopes indicate that estuary, beach and core sediments are dominated by Linlu River, not the mainstream. Soil samples show similar lead isotopes distribution with correlated catchments. However, sediment on top of the dune has distinct chemical and isotopic characteristics, implying possible aeolian source. In summary, lead isotopes are robust tracer for the leached fine sediments in Gangkou River catchment but chemical compositions, including REEs, are not. The results of estuary core indicate that the sediment are dominated by tributary and dune sediment on the beach shows an unidentified source.