



## **Geochemistry and provenance study of sediments from different Tectonic settings near Taiwan**

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Marine sediments are palaeo-environmental archives accessible through sediment chemistry and mineralogy. In the oceans, proxy elements also provide valuable data on biological productivity, ocean circulations and sediment diagenesis. In the tropical Southeast Asia, extremely high sediment discharges and rapid rates of tectonic uplift (e.g., Taiwan, Philippines and Indonesia) make river basins as key regions for studying factors that control chemical weathering. Previous studies on chemical weathering are primarily based on fluvial sediments. However, information on the long-term erosion and weathering history of these river basins in the Southeast Asia is still limited. Therefore, we study the source-to-sink for sediments collected from 5 different tectonic settings near Taiwan: (1) eastern offshore Taiwan, (2) the Luzon forearc basin, (3) accretionary wedge off SW Taiwan and along the Gaoping and Penghu canyons, (4) perched basins in the upper accretionary wedge, (5) the South China Sea domain (Formosa Canyon and the overbanking area of the Manila trench). And compared the mineralogy and sediment chemistry for sediments collected in different tectonic settings around Taiwan to unravel the tectonic and climatic controls on sediment weathering. The provenance and extent of weathering in the source were estimated using grain size analysis, clay mineralogy, and major, trace element analysis of the sediment samples. Grain size analysis of the sediments shows moderate to very poorly sorted sediments and the textural group lies between clay-fine-silt to slightly-fine-medium-sand, indicating mixed sediment sizes. Different oxide and trace element ratio of the sediments and weathering trend ternary diagrams indicate moderate chemical weathering, however, strong physical erosion can be responsible for high contents of primary minerals. From the ITRAX-XRF qualitative analysis it is found that different ratio signifies different sources, environments for example, in the present study we selected elements Sr, Ca and Fe that better characterize the relationship between detrital and biogenic sedimentation. These data help us to characterize different types of turbidites as well as to define the hemipelagic intervals. Cores investigation indicate that alternating hemipelagite and turbidite facies are characteristics of the sedimentary records.

**Keywords:** Paleoenvironment, Chemical weathering, Provenance, diagenesis, South China Sea, ITRAX-XRF