

# **Sr isotopic geochemistry of the surface sediment since 100 y in the Taiwan Strait: tracing the provenance of the inner-shelf mud wedge**

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Taiwan Strait, bounded by China continent to the west and the island of Taiwan to the east, connects the East China Sea and South China Sea, considered a good place to study the flux and fate of sediments from small Taiwanese rivers. Based on historical measurements and estimates, southwestern Taiwanese rivers discharge ~ 80 Mt of sediment to the Taiwan Strait each year. The fluvial materials in Taiwanese rivers are chief composed of mud (~70%), which contradicts the fact that Taiwan Strait shelf is dominated by relict sandy sediments. Only ~ 15% mud sediment from Taiwanese rivers deposits in the Taiwan Strait. The mud belt in the northern Taiwan Strait is considered to be sourced from the Changjiang and Minjiang rivers, there is no exported from Taiwanese rivers, is it true? Four cores collected in the mud wedge at the west side of Taiwan Strait, Sr isotopic composition of the detrital sediment is analyzed to trace the sediment provenance in the past 100 yr. Only one site, Y31 (119.43°E, 25.06°N), with the water depth of 25 m, has the similar Sr isotopic composition to Yangtze River ( $^{87}\text{Sr}/^{86}\text{Sr} = 0.72248$ ), indicating the mud sediment supplied from Yangtze River. The China Coastal Current (CCC) is driven by the northeast monsoon, moving sediment from Yangtze River mouth southward to emerge into the northern Taiwan Strait. The most northern Site Y11 (119.54°E, 26.07°N) is typified with more radiogenic  $^{87}\text{Sr}/^{86}\text{Sr}$  ratio (averaged to 0.7261) than the Yangtze River, suggesting the addition of mud sediment from Minjiang River. Site Y23 (120.02°E, 25.26°N), with the water depth of 58 m and the highest accumulated rate, the averaged  $^{87}\text{Sr}/^{86}\text{Sr}$  ratio detrital sediment is 0.7192, indicates the addition of mud sediments from Taiwanese rivers ( $^{87}\text{Sr}/^{86}\text{Sr} = 0.71215$ ). It is believed at least 30% mud sediment is supplied from the Taiwanese rivers in the past 100 yr. Another Site

Y41 (120.02°E, 25.26°N), with the water depth of 40m, also is typified with less radiogenic  $^{87}\text{Sr}/^{86}\text{Sr}$  ratio (0.7185). About 40% mud sediment is estimated from Taiwanese Rivers before 1980s, then increasing linearly to 55% until 2000s. The Sr isotopic composition of detrital sediment at four cores first prove that the contribution of Taiwanese mud sediments to the inner mud wedge, the flux of Taiwanese mud sediment accumulated in the Taiwan Strait is underestimated in the past. Based upon the currents circulation of Taiwan Strait, the Taiwanese mud sediments deposited in the inner-mud wedge should occur in spring or fall.