

Implication and Deposition of Terrigenous Organic Carbon from a Small Asian River to the Southern Okinawa Trough

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Small Asian island rivers are important sources of particle entering the ocean. Together with huge amounts of inorganic particles, large quantity of terrigenous organic carbon could also transport from these rivers into the ocean. However, very little information is available concerning source, transport and fate of these small Asian rivers derived terrigenous organic carbon entering into the ocean. In this report, we study organic carbon deposition in the Southern Okinawa Trough to evaluate source(s), and amounts of organic carbon burial in the study region by measuring organic carbon concentrations, carbon isotopic variations, and grain sizes. A total of 120 box core sediments covering the Southern Okinawa Trough and surrounding shelf and slope region are used.

The results showed that Lan-yan River in the Northeastern Taiwan is the major source of terrigenous organic carbon deposited in the study Southern Okinawa Trough. Terrigenous organic carbon with isotopic compositions as low as -27 per mil were found in the deeper basin part of the southern Trough. These lower isotopic carbon values were direct extension, in elongate fan shape, from the Lan-yan River mouth. Similarly, higher concentrations of organic carbon were also found for these terrigenous derived sediments. The surrounding areas were characterized by lower concentrations of organic carbon with isotopic signature similar to marine in origin. The large spatial variations of organic carbon concentrations are controlled by the grain-size variations. Contrary to a common hypothesis that the source of organic carbon in the Trough was derived mainly from the Yangtze River of far away distance, the spatial variations of organic carbon isotopic signatures indicate that most terrigenous organic carbon are derived from the Lan-yan River of the adjacent island of Taiwan.