Isotopic insights for sources and export behavior of organic carbon to deep ocean through a submarine canyon in active margins

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The transfer amount and efficiency are believed to be greater in active than passive margins. Submarine canyons serve as conduits at western Pacific active margin conveying terrestrial organics into deep sea, particularly, during episodic flood events. In spite of its importance, the behavior of ephemeral canyon transportation remains unclear. A sediment trap was deployed at 610 m deep in the Gaoping submarine canyon in 2008, during deployment Typhoon Kalmaegi passed. Basing on relations among ^{13}C, ^{14}C and TOC between soil and trap samples, we quantify the fraction of biospheric non-fossil (OC_{nf}) and fossil organic carbon (OC_f). The isotopic compositions of OC_{nf} components for hyperpycnal (pM of 0.63%, d13C=-25.2 permil) and hypopycnal periods (pM of 0.71%, $d^{13}C$=-23.8 permil) were both pre-aged and well pre-mixed, yet distinguishable. Isotopic evidences suggested that OC_{nf} in hyperpycnal and hypopycnal flows were highly likely sourced, respectively, from organics buried in ancient landslides and reworked shelf sediments with addition of marine organics. Results shed lights on the behavior of organics transport in active margin.