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Dispersal and fate of sedimentary organic matter in the Yellow and East China Seas: a source to sink view with the role of depositional hydrodynamic forcing

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Coupling with the hydrodynamic and depositional processes, the dispersal and fate of sedimentary organic matter (SOM) in the Yellow Sea (YS) and East China Sea (ECS) was studied based on elemental, isotopic and molecular biomarker (n-alkanes, perylene) parameters in surface sediments. The distribution of total organic carbon (TOC) coincides with that of the sediment grain size, suggesting the hydrodynamic constraints on the accumulation of SOM. There existed a significant presence of terrigenous-derived n-alkanes in the central YS mud deposits inferring from these molecular parameters and PCA identification, suggesting the dominant role of the hydrodynamic forcing on the selective dispersal and preferential accumulation of the fluvial terrigenous OM in the YS. The central mud deposits of the YS are the sinks of the long-distance transported Yellow River-derived sediments and its associated terrigenous OM; For the coastal ECS, the presence of bacteria/algae-derived organic matter (OM) and agriculture soil-derived OM could be responsible for the lower C/N and elevated δ13C values. There could be an effectively preferential dispersal of land-based SOM, while with potential subsequent degradation induced by the local addition of marine-derived OM. The significant relationships between perylene and the terrigenous organic matter (OM) proxies could suggest a combination of the predepositional fluvial input of perylene and in situ formation from its precursors with land-derived OM origins for its appearance in the coastal ECS. The deposition flux of perylene could be likely served as a geochemical imprint to assess the river input influence on the sedimentary environment of the coastal ECS.