

# **Provenance of clastic sediments in the boundary area between Yinggehai Basin and Qiongdong Nanhai Basin**

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The Yinggehai Basin and the Qiongdongnan Basin are Cenozoic sedimentary basins in the northwest of the South China Sea, located at the intersection of the Eurasian Plate, the India-Australia Plate and the Pacific Plate. This basin preserves important sedimentary records of Cenozoic uplift and denudation of the Qinghai-Tibet Plateau, adjacent plate tectonic activities, and the formation and evolution of the East Asian monsoon. Multiple large gas fields and multiple oil and gas structures have been discovered in this basin, indicating that this area has good prospects for oil and gas exploration. The basins received a large amount of terrigenous sediments, but the provenance evolution of the Cenozoic sediments in these two sea basins is still controversial. Combined with previous studies, the geochemical characteristics of sediment samples from the Oligocene to Pliocene at the junction of the two basins were analyzed, and the provenance evolution of the Cenozoic in the two basins was discussed. All sediment samples were from continental arc to passive continental margin environments. The results show that the enrichment of light rare earth elements and the stable content of heavy rare earth elements and the large negative Eu anomaly suggest that they may originate from Hainan Island. The reconstructed provenance evolution model shows that the Red River Source (RRS) provided sedimentary materials for the middle depression of the Yinggehai Basin from the Oligocene to the Pliocene, and the Hainan Island Source (HIS) was also the Miocene source of the Yinggehai Basin Middle Depression. One of the sources of deposition. However, most of the sediments preserved in the Yingdong Slope and Qiongdongnan Basin are derived from the Oligocene to Pliocene HIS, while those deposited in the Yingdong Slope are also derived from the Miocene RRS. In addition, the junction area of the two basins had mixed sources of RRS and HIS during the Cenozoic.