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# 渐新世以来南海北部陆坡区沉积演化及其对构造的响应

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## Sedimentary evolution in the northern slope of South China Sea since Oligocene and its responses to tectonics

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**摘要** 通过对南海北部陆坡下部ODP1148站位沉积物中陆源矿物组分的含量、堆积速率、粒度、石英氧同位素及石英扫描电镜的分析,探讨南海沉积演化及其构造响应.结果显示,根据综合指标的变化特征可将南海海盆的沉积演化划分为5个阶段:扩张初期 (34~28.5 Ma)、构造活动剧烈期(28.5~23 Ma)、构造活动减弱期(23~16.5 Ma)、热沉降期(16.5~3.5 Ma)和台湾隆升形成期(3.5 Ma~现今).其中28.5~23 Ma为物源转换期,陆源矿物组成和石英氧同位素值发生了明显改变,对应南海渐新世以来演化过程中构造活动最为活跃的时期.在此之前的渐新世南海扩张初期,研究区的沉积物主要来源于南部(很可能来自巴拉望陆块);随着南海的不断扩张,尤其是南海扩张轴在25~23 Ma发生向南跳跃后,南部巴拉望陆块不断远去,而此时由于青藏高原隆升导致的区域地貌变化还没有波及到云贵高原和华南地区,珠江等大河尚未发育,因此研究区以北的华南大陆的影响还很小或根本没有影响到研究区,结果陆源矿物沉积速率极低.随后由于青藏高原隆升的高度不断增加,河流发育,溯源侵蚀增加,华南内陆古老的沉积岩区成为南海北部主要物源区,南海北部转为以远源沉积为主,直到3.5 Ma前后由于台湾岛的抬升,大量物质进入南海北部,成为主要物源.物源转换期间在南海不断扩张的构造运动背景下由于物源供应匮乏,加上海平面的上升和较强的底流作用导致了ODP1148站位渐新世晚期的沉积间断.

**关键词:** 南海 ODP1148站 渐新世 石英氧同位素比值 陆源矿物 物源

Abstract: We here reconstruct the sedimentary evolution of South China Sea since Oligocene using samples from Ocean Drilling Program (ODP) site 1148 in the northern South China Sea based on a multi-proxy approach including monomineralic quartz oxygen isotope ratios ($\delta^{18}O$), grain-size of isolated terrigenous materials,terrigenous mineral accumulation rate and SEM analysis of isolated quartz. It was found that the sedimentary evolution of South China Sea Basin could be divided into five stages: period of initial expansion (34~28.5 Ma), period of intense tectonic activity (28.5~23 Ma), period of reduced tectonic activity (23~16.5 Ma),period of thermal subsidence (16.5~3.5 Ma) and period of Taiwan uplift (3.5 Ma to present). Terrigenous mineral composition and oxygen isotope values of quartz altered significantly during 28.5~23 Ma which was the period of provenance transition, corresponding to the most active period of South China Sea since Oligocene. Sediment source of ODP Site 1148 was mainly from Palawan during the early spreading period of South China Sea. With the extensive spreading of South China Sea, especially when the spreading axes of South China Sea jump to south during 25~23 Ma, Palawan continental block moved away constantly, and the changes in the regional geomorphic change caused by Tibetan Plateau uplift had not spread to Yunnan-Guizhou Plateau and South China, so Southern China mainland in the north had little or no impact on the study area, as a result, terrigenous mass accumulation rate was very low. Subsequently, owing to the rapid uplift of Qinghai-Tibet Plateau, rivers such as Pearl River developed gradually, so did the headward erosion, as a result, South China turned to be the main source of ODP site 1148, and South China Sea converted to distal deposition. With Taiwan Island uplift since 3.5 Ma, a large amount of terrigenous sediments entered into the northern South China Sea, Taiwan turned to be the major source provenance of the study area. The hiatus of ODP site 1148 in the late Oligocene resulted from the lack of terrigenous material supply, sea level rise and relatively stronger currents during the source transformation.

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