

Tectonic-Sedimentary Evolution and its Significances for Petroleum Exploration in the West Slope of Kaikang Trough, Muglad Basin

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Abstract

The west slope of Kaikang trough in Muglad Basin has been proven as hydrocarbon-enriched belt. However, no significant exploration breakthrough has been gained in recent years because the major play is unclear and accumulation mechanism controlled by several stages of tectonic activities is ambiguous. Therefore, restoration for tectonic-sedimentary evolution has been analyzed based on seismic interpretation and sedimentary facies analysis. The study results showed that the study area had undergone three stages of tectonic-sedimentary evolution, forming two sets of major play, upper play (lacustrine mudstone seal of Upper Nayil -delta sandstone reservoir of Lower Nayil) and the lower play (lacustrine mudstone seal of Aradeiba Fm.-fluvial sandstone reservoir of Bentiu Fm.). The stage I rifting of Early Cretaceous controlled the distribution range of in-place source rock of AG Fm. in the slope area, stage II rifting of Late Cretaceous controlled the development of traps in the lower play, and stage III rifting of Paleogene controlled the major period of hydrocarbon generation and expulsion that matched with the rifting. The three stages of tectonic-sedimentary evolution worked together to gain the hydrocarbon enrichment model of "fault-seal control the accumulation together, differential accumulation in multi layers" in the west slope of Kaikang trough.