Source of organic matter of Neoproterozoic to Early Cambrian shale from South China

NING WANG[1], MEIJUN LI[2], HAITAO HONG[3]

[1] *State Key Laboratory of Petroleum Resources and Prospecting, China University of Petroleum, Beijing 102249,China. 827750757@qq.com*

[2] *State Key Laboratory of Petroleum Resources and Prospecting, China University of Petroleum, Beijing 102249, China. meijunli@cup.edu.cn*

[3] *Exploration and Development Research Institute of Southwest Oil & Gas Field Company, PetroChina, Chengdu, Sichuan 610041, China. xfhht@petrochina.com.cn*

Study of the occurrence and formation of sedimentary organic matter of the shale in southern China provides valuable insights into the biomarker signatures of Neoproterozoic to Early Cambrian source rocks. Rock samples from two sets of potential source rocks in the Sichuan Basin and adjacent areas have been collected and geochemically analyzed in this study, including the lower Sinian Doushantuo (Z_1ds) shale and the lower Cambrian Qiongzhusi shale ($\in_1 q$) in the Gaoshiti-Moxi (GM) and Ziyang-Weiyuan (ZW) areas.

The distribution of biomarkers, carbon isotope compositions and microfossil characteristics reveal that green algae, bacteria and other biological organisms which are depleted in ^{13}C and have predominant C_{29}-steranes may be the main source of organic matter in the $\in_1 q$ shale in the Ziyang-Weiyuan area. However, the organic matter in the $\in_1 q$ shale in the Gaoshiti-Moxi area includes a significant contribution from red algae or other biological organisms which have relatively higher $\delta^{13}C$ values and predominant C_{27}-steranes. Red algae are also the main source of organic matter in the Sinian Doushantuo Formation, and sponges also make a significant contribution. Combined with biomarkers, carbon isotope compositions and microfossils, the biological source of organic matter in source rocks can be better depicted, which will contribute to understand the generation potential and geochemical nature of related petroleum.