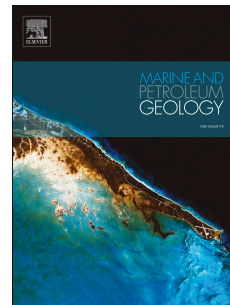


# Accepted Manuscript

Organic geochemical characteristics and accumulation of the organic matter in the Jurassic to Cretaceous sediments of the Saihantala Sag, Erlian Basin, China

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1 Organic geochemical characteristics and accumulation of the organic  
2 matter in the Jurassic to Cretaceous sediments of the Saihantala Sag,  
3 Erlian Basin, China

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13

14 **Abstract:** The organic petrology and organic geochemistry of Jurassic to Cretaceous hydrocarbon  
15 source rocks from the Saihantala Sag, the Erlian Basin, have been analyzed to determine their  
16 geochemical characteristics, hydrocarbon potential and organic matter accumulation. The  
17 mudstones of the Alatanheli Formation ( $J_{1+2al}$ ), the Aershan Formation ( $K_1ba$ ), the lower Tengger  
18 member ( $K_1bt^1$ ) and the upper Tengger member ( $K_1bt^2$ ) and the Saihantala Formation ( $K_1bs$ )  
19 contain variable total organic carbon concentrations and organic matter type. The observed  
20 macerals in the  $J_{1+2al}$ ,  $K_1ba$ ,  $K_1bt^1$  and  $K_1bt^2$  mudstones are sapropelinites (including lamalginites,  
21 mineral-bituminous groundmasses and rare telalginites), vitrinites and inertinites in order of  
22 abundance, whereas vitrinites and inertinites are the predominant macerals in the  $K_1bs$  mudstones.  
23 The vitrinite reflectances are lower than 0.7% in the studied samples, suggestive of their low  
24 organic maturity, which is consistent with the strong yellow fluorescence of the lamalginites and  
25 telalginites, low  $T_{max}$  values, the presence of  $17\beta(H)$ ,  $21\beta(H)$  hopanes and hop-17(21)-enes, and  
26 aliphatic and aromatic thermal maturity parameters. The studied samples were mainly deposited  
27 under anoxic saline lake environments. The major biological sources in the  $J_{1+2al}$ ,  $K_1ba$ ,  $K_1bt^1$  and  
28  $K_1bt^2$  mudstones are bacteria and algae, whereas higher plants are the more important biological  
29 source in the  $K_1bs$  mudstones as indicated by biomarkers and maceral contents. The  $J_{1+2al}$ ,  $K_1ba$ ,  
30  $K_1bt^1$  and  $K_1bt^2$  mudstones mainly have more capacity to generate oil than gas, whereas the  $K_1bs$   
31 mudstones are mainly gas prone. Despite the low thermal maturity of the studied mudstones,  
32 abundant oil has been found in the Saihantala Sag with mature source rocks. The nature of their  
33 generated products was due to their different formation mechanisms of organic matter  
34 accumulation. The organic matter accumulation in the  $J_{1+2al}$ ,  $K_1ba$ ,  $K_1bt^1$  and  $K_1bt^2$  mudstones

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