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Refining Depositional Environment Interpretation using Ichnofacies and their Potential Impact on Enhanced Reservoir Properties: a case study of Baiyinchagan Sag, Erlian Basin, China

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Summary

Baiyinchagan Sag in Erlian Basin of China is a continental faulted lacustrine basin, which experienced complex evolution during the Cretaceous. Besides sedimentary facies, ichnofacies proved important for refining depositional environment interpretation and reservoir characterization [1-3].

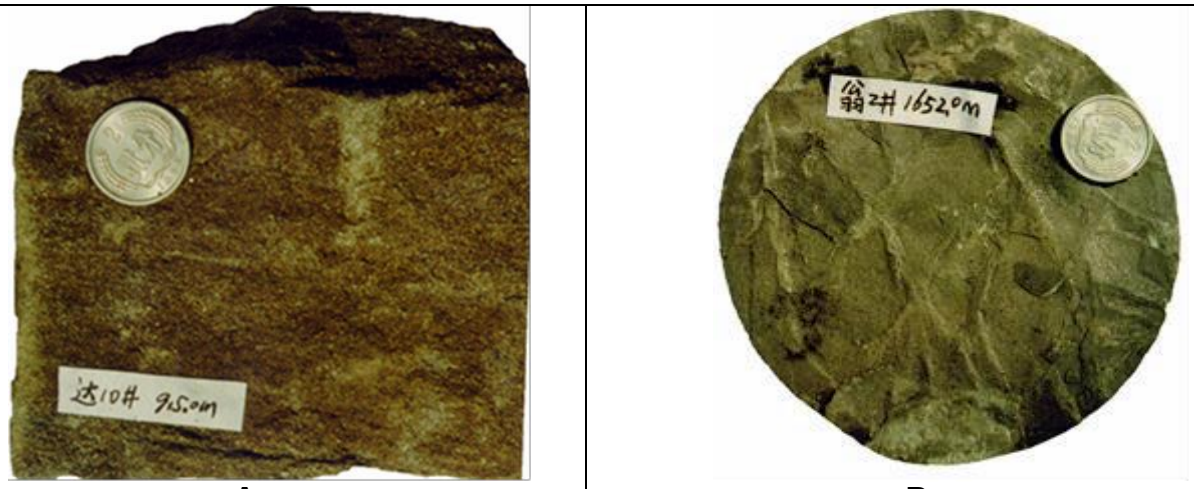
Method

Thorough observation and examination of cores is coupled with petrographic studies and porosity and permeability measurements.

Results, Observations, Conclusions

1. Some trace fossils, such as *Skolithos, Planolites, Scoyenia* and *Chondrites* developed in the sandstone and mudstone stratum. According to the ecological habits, they can be divided into *Domichnia, Fodichnia, Pascichnia.*
2. Relationship between lithology and trace fossils allowed for classifying them into three distinct types: i) the trace fossil assemblage associated with thick bedded sandstone. A typical example was *Skolithos,* found in grey sandstone, characterized by bioturbation index (BI) between 1 and 3, indicating relatively strong energy sedimentary environment and frequent sedimentary rate variations such as the high energy zone along the lakeside or the delta underwater distributary channel; ii) the trace fossil assemblage associated with interbedded sandstone and mudstone. For example, *Pasichnia* developed in the interbedded grey mudstone and sandstone, characterized by BI between 2 and 4, suggesting the turbidity sedimentary environment; iii) the trace fossil assemblage associated with thick bedded mudstone. These include *Planolites, Scoyenia and Chondrites* which are widely distributed in the grey mudstone, characterized by BI between 0 and 1, indicating relatively stable energy and quiet sedimentary environment such as shallow lake or delta front.
3. Observations and physical property measurements suggest that the sediments with trace fossils might have better reservoir properties.

Better understanding of the impact of trace fossils on enhanced reservoir properties might be achieved by minipermeametry and micro-CT analytical techniques [5].



A B

Figure.1. A, *Skolithos* developed in grey sandstone at 915.00m of Well Da10; B, *Pasichnia* developed in sandstone at 1652.00m of Well Weng2.

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