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Bioturbation Influence on Reservoir Rock Quality: A Case Study of Well Bian-5 from the Second Member Paleocene Funing Formation in the Jinhu Sag, Subei Basin, China

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The bioturbated horizons identified from Member Two of the Paleocene Funing Formation (E_1f_2) in the Jinhu sag, have not been previously assessed to ascertain their influence on reservoir quality. Owing to that, conventional thin section, pulse decay permeametry, pressure decay porosimetry, Field Emission Scanning Electron Microscope (FESEM) and Energy Dispersive X-ray Spectroscopy (EDS) methods were used to analyze the significance of bioturbation in controlling porosity and permeability on selected cored intervals from one well. Intensely bioturbated core slab samples A and B selected from Bian-5 Well are dominantly controlled by *Ophiomorpha* and *Macaronichnus*, respectively. Results showed that *Ophiomorpha* and *Macaronichnus* in sample an exhibited sediment cleaning activity with better sorted grains in burrow fillings. Mud and clay were removed from the burrow filling and directed towards burrow lining and/or host sediment by burrowing organism resulting in well sorted burrow fill matter; the net effect, enhanced isotropy and increased porosity in burrows fills. *Macaronichnus* ichnofabrics in sample B also exhibited sediment cleaning activity causing reduction of local porosity in host sediment and an outcome of permeability improvement in burrows. Reservoir quality of bioturbated sandstone of Bian-5 well in the Jinhu sag is, therefore, dependent on activity of burrowing organism, burrow structure, bioturbation extent as well as the existence or nonexistence of burrow fill or lining.

Biography:

The Main author is currently (2015 to Present) a final year PhD research student at the China University of Geosciences, Beijing studying Oilfield Development Engineering. His research focuses on Reservoir quality and Rock property trends of bioturbated facies. He holds a Master's degree (MEng) in Oil and Gas Engineering from the China University of Geosciences, Wuhan (2011 to 2013). Prior to that, he undertook his undergraduate study in Marine Engineering (BSc) at the Regional Maritime University, Ghana (2005 to 2009).