Facies and sedimentary cycles within the D and E Group in the north-eastern sector of the Malay Basin, Malaysia

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Core analysis of the Middle Miocene (E and D Group) succession in the north-eastern sector of the Malay Basin identified fifteen (15) lithofacies, differentiated on the basis of lithology, sedimentary structures, fossil content (& trace fossils) and diagenetic features. The lithofacies are:

- Lithofacies S-1: Draped-to-massive-to-laminated sandstone,
- Lithofacies S-2: Ripple-to-wavy bedded sandstone/siltstone interbedding, with minor shale,
- Lithofacies H-1: Heterolithic, wavy-bedded and laminated sand/silt/shale interbedded facies,
- Lithofacies H--2: Heterolithic, sand/shale wavy-bedded and laminated,
- Lithofacies M-1: Laminated mudstone, with thin stripes of siltstone layers and lenses,
- Lithofacies M-2: Maroon-colored, bioturbated and silty mudstone,
- Lithofacies M-3: Dark gray, well laminated mudstone with large plant fragments,
- Lithofacies M-4: Maroon, silty, bioturbated, Diplocraterion-bearing,
- Lithofacies M-5: Gray, clayey and laminated mudstone, with Fe-cemented bands,
- Lithofacies M-6: Gray, laminated mudstone, with Diplocraterion and/or Teichicnus,
- Lithofacies M-7: Dark gray, blocky mudstone,
- Lithofacies M-8: Black carbonaceous mudstone with coal lenses,
- Lithofacies M-9: Dull gray silty mudstone, well bioturbated, Lithofacies C Black coal, and
- Lithofacies PS: Bleached, yellowish-brown soil-like unit (Paleosol). These lithofacies can be grouped into three broad lithofacies associations. These are:
- a) Proximal overbank facies association fine-grained sand and silt deposits of levee, crevasse-channel and crevasse-splay, formed as a result of overbank flow of channel bed load;
- b) Lacustrine-floodplain lithofacies association laminated silt, shale and heterolithics deposited in low energy environments (lakes) on the floodplain;
- c) Backswamp lithofacies association ----

coal and paleosols formed by organic activity and pedogenesis.

These facies associations reflect deposition within a coastal-estuarine or coastal-deltaic floodplain environment. The presence of the trace fossils *Diplocraterion* and *Teichicnus* within the floodplain facies, in the upper section of the E Group, and the basal part of the D Group indicate brackish-water conditions, and signify marine incursions into the coastal floodplain environment. This may be related to a major transgressive phase.