

## **Ancient floodplain deposits within the Jura-Cretaceous alluvial complex near Bandar Muadzam Shah, Pahang: facies characteristics and climatic significance**

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The Jura-Cretaceous alluvial complex near Bandar Muadzam Shah exposes at least seven upward-fining cycles of sandstone-siltstone-mudstone succession with minor conglomerate. The sedimentary characteristics of the succession suggests that these are deposits of relatively sinuous alluvial channels. Detail stratigraphic logging have led to the recognition of three different types of floodplain deposits interbedded within the succession.

The first type of floodplain deposit occur at the lower levels of the succession as the capping layers overlying basal sandstones in Cycle 1, 2 and 3. The fine-grained deposit comprise dark gray to dark reddish-maroon massive mudstone punctuated with rusty-coloured, oxidised, lateritic palaeosol layers. The irregular palaeosol layers ranges in thickness between 10 to 30 cm. In Cycle 1 and 2, this deposit is also interbedded with inclined, thin layers of fine-grained sandstone which overlies the basal sandstone. Very little traces of former vegetation, either in the form of coal or rootlets horizon are present. Only a few scattered pieces of coalified wood fragments were observed at the base of Cycle 3.

The massive, unlaminated mudstones were probably deposited by floodwaters in areas of the floodplain that were normally subaerially exposed. Evidence of subaerial emergence is evidenced by the presence of the rusty coloured pedogenic layers. This floodplain facies reflect the dominance of a relatively dry climate with seasonal heavy rainfall and flooding.

Cycle 4 and 5 is dominated by flat-bedded, sheet-like green siltstone, both underlain by basal fine- to medium-grained sandstone. The total thickness of the two cycles exceeds 15 m. Individual sand sheets are 0.3–2.0 m thick, but amalgamation of beds are common. This unit is noted for the total absence of interbedded mudstone. No primary sedimentary structures is evident; the most conspicuous feature here are the highly spherical “dinosaur egg” concretions protruding from the beds.

Sheets sandstones and siltstones have been interpreted as the product of flash floods depositing sand and silt under upper flow-regime plane bed conditions. The green colour reflect reducing environment of deposition. The lack of mudstone facies indicate a temporally long, sustained flooding event with minimum traction current to winnow away the finer grained mud to more distal parts of the floodplain. This facies indicates that a fairly wet climate prevail throughout during its deposition.

The third type of floodplain deposit dominate the whole of Cycle 7. This unit comprises repeated, small-scale coarsening-upward successions of laminated fine-grained sandstone, siltstone and mudstone. Very small scale ripples are also present in the sand and silt layers. Syndepositional loading and micro-slumping structures are also common.

Interlamination of mud, silt, and very fine-grained sand is common in overbank areas, and represents deposition from suspension and from weak traction currents. This facies was probably deposited in a poorly-drained alluvial backswamps.

The contrasting climatic indicators exhibited by the different floodplain deposits probably indicate the difference in climatic regimes operating within the basin and its fluvial source area.