

The Upper Palaeozoic Singa-Kubang Pasu Megasequence: some thoughts on basin initiation, depositional and tectonic history

ABDUL HADI A.R. & MUSTAFFA K.S.

Department of Geology
University of Malaya
50603 Kuala Lumpur

The Early to Mid-Devonian deformation and metamorphic event which brings about the structural inversion of the Setul megasequence (the Machinchang & Setul Formation), was subsequently followed by a rifting episode, thus creating the nascent basin for the deposition of the Singa-Kubang Pasu megasequence. Initially, within an oxidising shallow marine environment, the basal red mudstones and sandstones facies were deposited. As the basin gradually deepens, clean, quartz-rich shallow marine sands were introduced into some parts of the basin. Further subsidence related to a more intense rifting phase, brought about significant changes to the spatial configuration of the Late Palaeozoic basin. This phase of tectonic movements resulted in the creation of at least two, and most possibly three, sub-basins. The westernmost Singa sub-basin is a small basin that remain *relatively stable* and shallow throughout the Late Palaeozoic. To the east, and separated from the Singa sub-basin by a half-graben type ridge, is the more extensive Kubang Pasu sub-basin, which can be separated into a shelfal-type and an abyssal-

type sub-basin. These sub-basins remain tectonically active throughout the Palaeozoic; these movements resulted in continuous, gradual subsidence that facilitated the accommodation of thick pile of clastic sediments.

The basinal configuration also governs the sediment supply into the different sub-basins. The smaller Singa sub-basin is starved of terrigenous detritus due to the absence of great uplifts and the lack of well exposed siliciclastic provenance. This resulted in the dark-coloured, muddy facies with abundant thin siltstones and subordinate flat-bedded sandstones.

The Kubang Pasu sub-basin, characterised by a more extensive rifting and associated vertical movements, receive a good supply of quartzo-felsphatic materials. The shallower, shelfal-type sub-basin (Perlis area) is characterised by a general shallowing-upward, sanding-upward flysch-type succession resulting from turbidite deposition throughout a large part of its evolution. The depth extent of the eastern abyssal-type sub-basin is reflected by the distinct shale-chert interbedding in the lower part of the succession. The upper part recorded substantial amount of sands, possibly brought into as turbidite fan deposits.

Towards the Early Permian, due to a rapid fall in relative sea level and possibly coupled with a regional climatic change, sedimentation within the Singa-Kubang Pasu basin gradually transform from a siliciclastic-dominated deposition into a mix, clastic-carbonate one, as shown in the Lower Permian 'Passage Beds'. The commencement of the Chuping limestone indicate the termination of the terrigenous-dominated Singa-Kubang Pasu regime, this possibly related to a new basinal order.
