SEDIMENTOLOGY OF A CYCLIC SEQUENCE OF THE BONGAYA FORMATION AROUND PITAS, SABAH

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The rocks of the Bongaya Formation, which is late Miocene to early Pliocene in age, underlie the southern portion of P. Banggi, the western side of the Bengkoka Peninsula, the whole of P. Jambongan, lower Paitan Valley and the southern side of Sugut Valley in north Sabah, and consist of mudstone, bioturbated mudstone and siltstone, heterolithic mudstone/sandstone, flat and cross bedded sandstone facies with occasional carbonaceous to coaly beds and limestone lenses. Alternation and cyclic occurrence of the various lithofacies are typical. Truncated blocks, appearing like 'unconformities', but representing slide blocks of synsedimentary faulting, probably of growth fault genesis, are common.

The present paper concentrates on the cyclic aspect of part of the Bongaya Formation rocks as exposed at a cleared-up area next to Sekolah Menengah Pitas, near Pitas town. The formation at this locality consist of truncated sequences of thick alternations (2 to 12 m) of sandstones and mudstone lithofacies. The

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sandstone facies can be subdivided into two subfacies, i.e. cross-bedded sandstone subfacies and laminated sandstone subfacies. The cross-bedded sandstone subfacies is made up of clean sandstone, and is medium-scaled cross bedded (0.3 to 0.5m). Mud clasts are commonly found on the forset of the cross beds. The laminated sandstone subfacies is made up of very fine to fine sandstone, is thin (1.0 to 20 cm) and is ripple bedded.

The first subfacies is interpreted to represent off-shore bar morphology whilst the second subfacies is interpreted to represent bar edge, and both were subjected to the forces of waves and tidal influence.

The mudstone facies is similarly divided into two subfacies; i.e. white mudstone subfacies and sandy mudstone subfacies. The white mudstone subfacies consists of clean, white mudstone, 0.5 to 20 cm thick, and appears not to have any internal structures. It is found to be associated with laminated sandstone subfacies and occurs as mud drapes. The sandy mudstone subfacies consists of interbanded grey mudstone, and lenticular to flaser to wavy banded sandstone of variable thicknesses. Burrows are common and bioturbation are occasionally intense to the extent that the original sedimentary structures are totally destroyed. At some places, carbonaceous matter content is high, rendering the mudstone black. From the combination of sedimentary structures, burrows and bioturbation, the mudstone facies is interpreted as representing deposits in the interbar and littoral areas.

The alternation or cyclic occurrence of the two lithofacies, i.e. the sandstone facies and the interbar/ littoral mudstone facies is interpreted to be the result of recurring transgression and deposition, probably as a consequence of active Neogene tectonics in the area.