Asymmetrical deformation, thrusts and mesoscale fracturation of the Nyalau Formation at Bintulu

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The Nyalau Formation (Oligocene-Miocene) was deposited in a coastal deltaic environment. It is a succession of sandstones and shales. In Bintulu the sequence has registered an episode of deformation which has structured the area into asymmetrical folds, thrusts and mesoscale fracturation.

The folding is a succession of asymmetrical synclines and anticlines ENE-WSW orientation. The Nyalau anticline and the Bintulu syncline have axes plunging gently to the WSW. The thrusts are widespread with vergence towards the south. The front of the thrusted unit is recognised by vertical to reverse dips, overturning of the sequence and intense fracturation.

The mesoscale fracturation show four main directions 010°, 030°, 150° and 170° which are conjugate shears and hybrids. Normal faults are oriented mainly E-W. The lithology of the sequence respond differently to the deformation; the clean sandstones are fragile, the shales and sandstones rich in organic matter attenuate the pressures with their compressive character and then show spectacular structures as movement accommodation.

This structuration is the result of the structural events that occurred during Late Early Miocene-Middle Miocene further north involving the collision of the Luconia with Borneo. This structural edifice probably continued to the offshore and may develop traps similar to those related to the thrust belts but at different scales.

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