

Ben M. Clennell : A reappraisal of the stratigraphy of Eastern Sabah

Laporan (Report)

Dr. Ben M. Clennell, who is currently with the University of Birmingham working on tectonic and hydrogeology of accretionary complexes, gave the above talk on 11th December 1992 at the University of Malaya. Dr. Clennell completed his Ph.D. on "The M \acute{e} langes of Sabah, Malaysia" in 1992.

Abstrak (Abstract)

The existing stratigraphical scheme for Sabah is a compromise between the earlier system of nomenclature into Groups, and subsequent attempts at chronostratigraphic subdivision.

The earlier scheme (largely devised by Collett, Haile and others) was unsuccessful because of the lack of biostratigraphical data, and misinterpretation of the chronostratigraphic meaning of different taxa. The old Indonesian letter classification that was used was subsequently found to be both inaccurate and misleading. This was made worse by the reliance on larger foraminifera as the primary age-determining group, because these fossils are easily reworked into younger sediments. There was also the problem of the same rock unit acquiring different names in different geographical localities (Note this appears to be of much less importance in Sabah than areas such as Sarawak or Sumatera). Some rock units were split into "Formations" artificially. For example, the Sabah Ophiolite was split into "Crystalline Basement" and "Chert-Spilitic Formation".

Later biostratigraphic work made use of the microforaminiferal record, which unfortunately is sparse in all but a few rock units. This led to a subdivision of the previously identified lithostratigraphy. As a result, some obvious lithostratigraphic boundaries lost their importance while other boundaries were created artificially, rather than being based on the main lithological differences.

The volcanic arc rocks of Sabah were largely bundled into the Segama group, and because of a lack of chronostratigraphic data, the division into an older and younger suite was not artificially delineated. Recent work indicates two main volcanic phases, but with a much longer and more continuous history of magmatism than previously thought.

The most notable problem however, was the m \acute{e} langes in eastern Sabah, which were somehow shoe-horned into three "Formations", namely the Ayer, Kuamut and Garinono Formations. The m \acute{e} langes are in fact a complex collage of dismembered sediments, ophiolite and arc rocks produced by a combination of sedimentary tectonic and diapiric processes. The time of the main m \acute{e} lange-forming episode is well delineated across eastern Sabah and it ties in both with major tectonic events (the opening of the Sulu Sea and collision at the Northwest Borneo margin) and with a major change in the depositional systems.

The work carried out by the author on the m \acute{e} langes also provided insights into the more general stratigraphic development of Sabah. New biostratigraphic work was conducted (palynology, nannofossils, microfossils), and earlier fossil assemblages re-interpreted with the benefit of newer zonal classifications.

A new appraisal of the stratigraphy of Sabah is called for, as the current definition of lithological units confuses the true geological and tectonic history of the area. The fact that many of the first-order lithostratigraphic units which can be recognised are time-transgressive and composed of different sub-facies (e.g. carbonate, clastic and volcanoclastic) should be recognised more clearly and not obscured by unwarranted subdivision.

