

Enterolithic Structures

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Differential changes in volume in the solidification process of carbonate and siliciclastic components of the Setul limestone are exhibited in rock outcrops of the formation at Pantai Beringin and Tanjung Cawat coastal stretch (Figure 1). The dark parallel strings are siliciclastic layers in its host rock of Setul limestone located at the east end of Pantai (coast) Beringin (Figure 2). A few hundred meters from the locality of Figure 2 at Tanjung Cawat is a large recumbent fold verging west. The dark coloured strings of siliciclastic material are crumpled, and sometimes show up as overfolds (center of Figure 2). The overfold structures may attain strong complexity

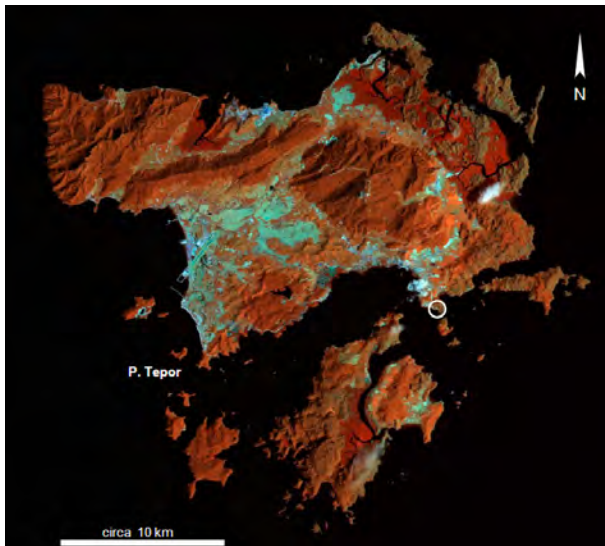


Figure 1: Index of Southeast corner (white circle) of the main island of Langkawi.



Figure 2: Part of 12-meter high outcrop of Setul Limestone at Pantai Beringin. Siliciclastic layers form dark bands, that sometimes exhibit crumpling. Figure 3.5, page 35, in Jones (1973) is from this locality.

(Figures 3 and 4). The complex of small overfolds in Figure 3 indicates 43 per cent shortening. The crumpled layers in Figure 4 appear as parts of outcrop-size antiform and synform. The minor structures occur on a limb of the large recumbent fold (Figure 5), its axis (marked by X) striking 350 degrees and in subhorizontal position.

The crumpled siliciclastic layers suggest much less volume changes had occurred, compared to those affecting the carbonate host rock during diagenesis at this particular location in Langkawi. Such structures are labeled as products **enterolithic deformation**.

These features were erroneously named “stylolites” (Jones, 1973, p.33-35) while the updated edition remained largely silent, Lee (2009, p.63), however, still included “stylolitic Setul Limestone” in Table 5.1. Bates and Jackson (1980) refer to stylolite as “a surface or contact, usually occurring in homogenous carbonate rocks and more



Figure 3: Strong deformation of siliciclastic interbeds in carbonate host rock, Strain of 43 per cent is indicated. Tanjung Cawat, SE point of Langkawi main island.

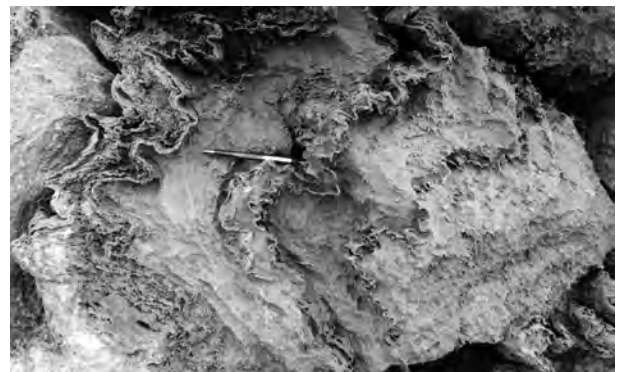


Figure 4: The distribution pattern of crumpled bands suggests a larger size of antiform-synform couple.

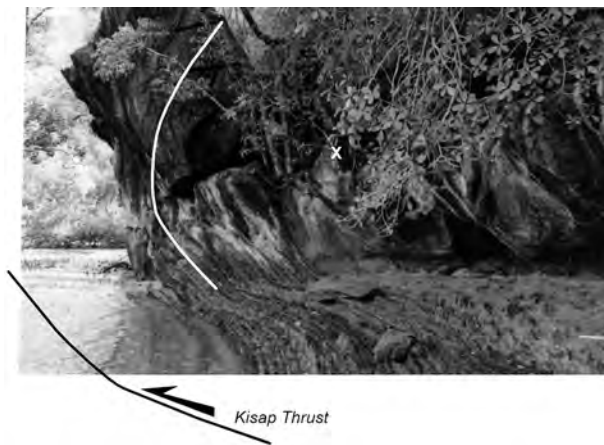


Figure 5: View along the axis (marked by X) of the large recumbent fold consisting of Setul Limestone, Tanjung Cawat, SE point of Langkawi main island. The large recumbent fold is thrust over the regional Kisap Thrust. The Ordovician-Silurian Setul Limestone was thrust over Mid-Permian Chuping Limestone.

rarely in sandstones and quartzites, that is marked by an irregular and interlocking penetration of the two sides, the columns, pits and teeth-like projections on one side fit into their counterparts on the other. As usually seen in cross section, it resembles a suture or the tracing of a stylus. The seam is characterized by a concentration of insoluble constituents of the rock, e.g. clay, carbon, or iron oxides, and is commonly parallel to the bedding. Stylolites are supposedly formed diagenetically by differential vertical movement under pressure, accompanied by solution.”.

REFERENCES

- Bates, R.L. & Jackson, J.A. 1980, Glossary of Geology, second edition. American Geological Institute, Falls Church, Virginia.
- Jones, C.R. 1973, Lower Paleozoic. In: Geology of the Malay Peninsula. West Malaysia and Singapore: Wiley Interscience, New York.
- Lee, C.P. 2009, Chapter 5. Paleozoic Stratigraphy. In: Geology of Peninsular Malaysia. University of Malaya & Geological Society of Malaysia, Kuala Lumpur.

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