

Plant fossils and some geological aspects of the Ulu Endau Area, Johore-Pahang

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Abstract: Three main rock types are found in the Rompin-Endau area. These are volcanics, igneous intrusives and sedimentary sequences. Metamorphic rocks occur only at Gunung Lesong. The volcanic rocks are referred to as the Jasin volcanics and represent the oldest rocks of the area, probably of Mid-Permian to Triassic age. Some of these rhyolites are also mylonitised. A granite batholith found on the western flank of the area can be termed a biotite-adamellite granite. This granite pluton which has intruded the volcanic rocks, is similar to those found in other parts of the Ulu Endau area and has been dated to be of Late Triassic Age.

On the eastern plateau, sedimentary sequences of sandstone, shale, siltstone and mudstone overly the volcanics. A similar sequence of sediment is seen capping the granite hill 1448 on the western side, forming a mesa. These sediments are referred to as the Tebak Formation which is of continental origin and exhibits subhorizontal dips. Plant fossils were recorded from light grey mudstone beds in the tributaries of Sungai Telentang, and a boulder of silicified wood was found in Sungai Anak Seladang on the western flank of Sungai Kinchin. The plant fossil has been identified as *Frenelopsis malaina* Ko'ono, which is a foliage of a conifer plant, giving an age of Upper Jurassic - Lower Cretaceous. The silicified wood is also that of a conifer plant *Araucarioxylon telentangensis* Idris with a minimum age Late Triassic. A major fault trending 345-350° runs along Sungai Kinchin.

INTRODUCTION

Field visits into the Ulu Endau area in February and March 1992 revealed two new plant fossil localities. Five pieces of silicified wood were recovered from river beds during routine traverses in the area. The lithological boundaries and major structural elements in the area were also considered. The implications of these discoveries are discussed below.

Location and general geology

The Ulu Endau area surveyed are bounded by latitudes 2°32'28"N and 2°35'45"N and longitudes 103°15'30"E and 103°22'45"E (Fig. 1). This area is part of the proposed National Park that straddles the Johore-Pahang boundary. Sg. Endau and Sg. Kinchin are the major rivers that drain the area.

Lithologically the area is underlain by volcanic rocks consisting of acid pyroclastics. These are mainly tuffs and rhyolite and are referred to as the Jasin volcanics. They represent the oldest rock in the area and is probably of Mid-Permian to Triassic age (Idris *et al.*, 1987). Some of the rhyolites along Sg. Kinchin are mylonitised.

A granite batholith is observed on the western flank of the area. The granite is of biotite adamellite type. This granite is similar to those found on the other parts of the Ulu Endau area, which has been dated to be of late Triassic age by Bignell & Snelling (1977).

On the eastern plateaux, a sedimentary sequence of sandstone, shale, siltstone and mudstone overlies the volcanics. A similar sequence of sediments is seen capping the granite hill 1448 on the western side, forming a mesa. These sediments are referred to the Tebak Formation which is of continental origin (Rajah, 1969; Rishworth, 1974). They exhibit subhorizontal dips. No actual contact between the sediments and the underlying rocks was seen in the field. But based on their first appearances, they were found at different levels at the foot of G. Keriong, occurring as low as at the 15 m contour height to as high as the 75 m level. No faulting is detected here. However, in the mid-section of Sg. Telentang, the river flows through a narrow gorge (fault gorge) and breccias are evident. Further upriver, the sedimentary rocks occur at about 180 m contour height. The Tebak Formation at hill 1448 appeared at about 400 m high.

Plant fossils were recovered from light grey mudstone beds in the tributaries of Sg. Telentang (Fig. 1) which corresponds to stratigraphic levels of 20 and 45 m up section.

Boulders of silicified wood were recovered from the river bed of Sg. Telentang that flows through volcanics at locality 1, but more were found upriver (flowing through the sedimentary sequence) at localities 2, 3, and 4 (Fig. 1). A single piece of silicified wood boulder was found in Sg. Anak Seladang on the western flank where the river flows through granite at locality 5.

Paleontology

The plant fossils found in the mudstone is here identified as *Frenelopsis malaiana* Ko'ono which is a foliage of a conifer plant. The silicified wood is also that of the conifer plant, *Araucarioxylon telentangensis* Idris. Ko'ono (1967, 1968) and Smiley (1970) assigned *F. malaiana* to the Upper Jurassic - Lower Cretaceous age. Idris (1990) suggested that the minimum age of *A. telentangensis* is late Triassic.

These fossils are deposited in the Paleontology Collection, Dept. of Geology, University Malaya, Kuala Lumpur.

DISCUSSION

From the above observations a few inferences can be made. These are:-

- (i) The inferred geological boundary at the base of G. Keriong suggest sedimentation of the Tebak Formation on an erosive base. However, no

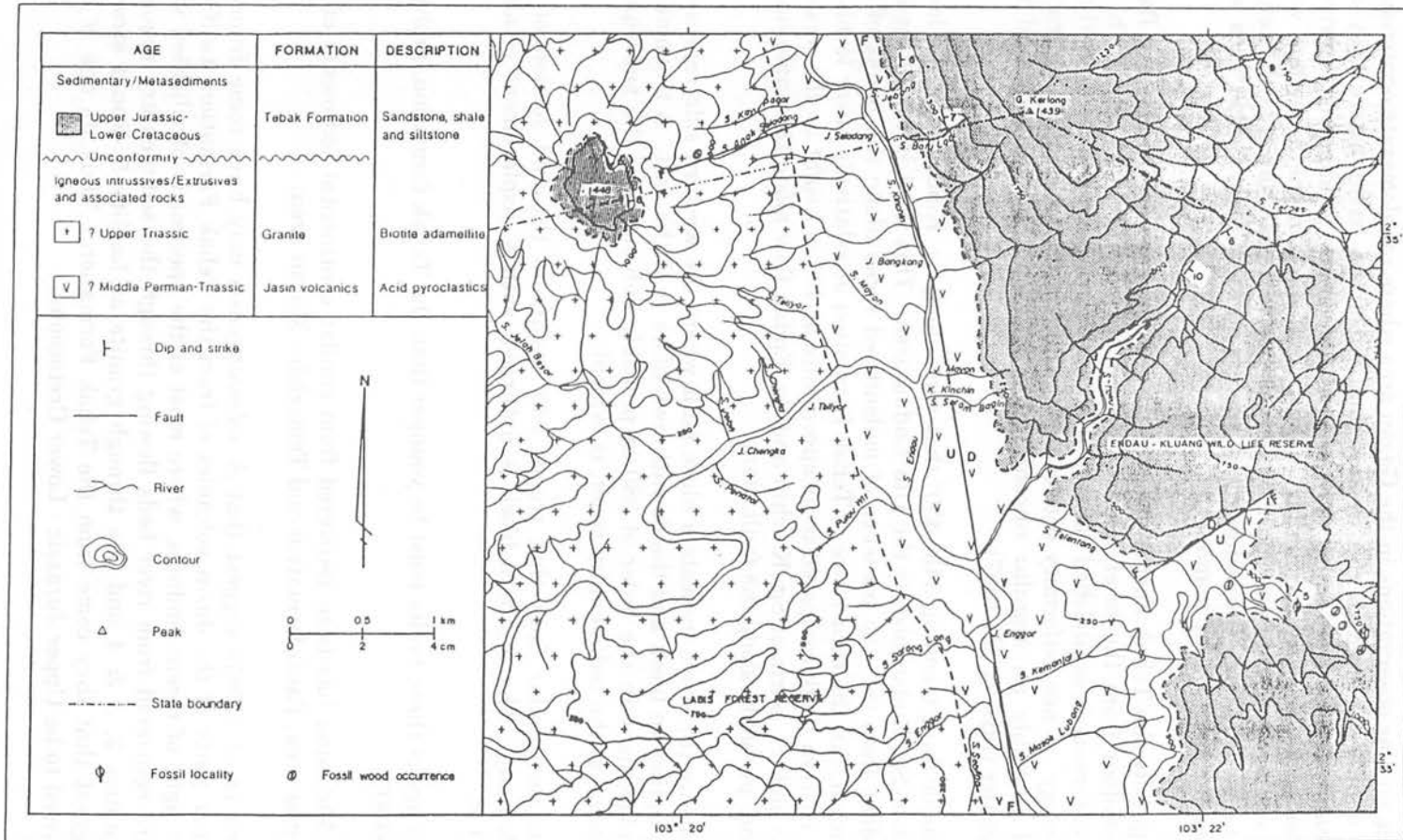


Figure 1: Geological map of Rompin-Endau Area and fossil localities (Idris, 1990).

conglomerate was observed. This is not uncommon as Rishworth (1974) made similar observations in the Gagau area where conglomerate occurrences are mainly confined to the western margin of the basin where they are probably derived from failed fault scarps. The gentle gradient of the rivers (these rocks also exhibit similar subhorizontal dips) in the area then were not strong enough to transport the larger size materials towards the centre of the basin. Thus the sedimentary succession in the Ulu Endau area was deposited in a similar manner.

Originally the Tebak Formation covered a larger area on the western flank as evident from the brief remnant as a mesa on hill 1448. As such, an unconformity is established between the Tebak Formation and the underlying lithology - nonconformity between the sedimentary rocks and the granite and probably an angular unconformity between the sediment and the volcanics (Idris *et al.*, 1987).

- (ii) A major fault trending 345° - 350° that runs along Sg. Kinchin and the lower part of Sg. Endau bisects the Ulu Endau area. This fault is established as evident from (a) the presence of mylonitised rocks along the banks of Sg. Kinchin, (b) the occurrence of Tebak Formation at relatively lower levels on the eastern flank compared to its appearance at 400 m height on the western side and (c) parts of Sg. Kinchin and Sg. Endau flow along the same linear trend, probably along the fault plane.

Evidence (b) above indicate a block fault where the western side represents the upthrown block and the downthrown block is to the east. A tremendous displacement in the order of 380 m probably enhanced by the subsequent removal of the sedimentary cover, is evident.

A minor similar fault that trends 045° occurs in the mid section of Sg. Telentang. The southern block is upthrown with a displacement of about 150 m.

The age of these faults must be younger than the Tebak formation, probably Tertiary.

- (iii) *F. Malaiana* has been recovered from similar continental sediments of the Gagau area, Panti formation and Temerloh - Maran area.
- (iv) Idris *et al.* (1987) suggest that *A. telentangensis* may have come from the upper parts of the Jasin volcanics of from the Tebak Formation itself. In the light of recent findings, where most of the specimens of silicified wood were recovered from river beds flowing through the sedimentary sequence localities 2, 3 & 4 and one through granite at locality 5, would strongly suggest that they come from the Tebak Formation. Thus its age is here revised to be Upper Jurassic - Lower Cretaceous.

- (v) As the foliage *F. malaiana* and wood *A. telentangensis* are both conifers, the possibility that they represent the same tree cannot be ruled out.

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