Palynomorphs from an intermontane basin, Thailand: a significant finding on *Florschuetzia* tp. pollen

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Thirty (30) samples from a 45 m-long core drilled in Sa Kae Ngam Coalfield, Nong Ya Plong Basin, Thailand, were analysed for their palynomorph content. The core penetrated Lower Miocene lacustrine sediments which consist of a 10 m thick mudstone with siltstone and sandstone interbeds. The mudstone is overlain by a 6 m thick bituminous coal which is in turn overlain by a thick succession of mudstone with

Warta Geologi (Newsletter of the Geological Society of Malaysia), Vol. 25, No. 3, May-June 1999
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occasional thin layers of carbonaceous material. All samples contained rich assemblages of palynomorphs believed to have been derived from aquatic and hydrophytic plants, and dryland vegetation.

In this paper, the results of palynological analysis on the coal and the underlying mudstone units are presented. Palynomorph assemblages in the lower part of the mudstone unit are dominated by *Alnipollenites verus* and bisaccate pollen together with pteridophyte spores. The upper part of the mudstone unit, which is immediately underlying the coal bed, yielded abundant bisaccate pollen and the freshwater algae, *Pediastrum* spp. and *Botryococcus braunii*, together with common pollen bearing a close morphological resemblance to the genus *Florschuetzia* and related lythraceous taxa. Two samples analysed from the coal bed yielded reduced abundance of *Pediastrum* spp. but increased representations of *A. verus* and lythraceous/*Florschuetzia* pollen together with hinterland bisaccate pollen.

Sediments from the lower part of the mudstone unit are thought to represent deposition in an *Alnus* and fern-dominated swamp which was surrounded by mountains with Pine and Spruce forests. The swamp was probably transformed into an open lake which was fringed by mostly lythraceous and, to a lesser extent, *Sonneratia*-related plants. Pine and Spruce forests formed the dominant vegetation in the surrounding hinterland and mountains. With time, as the lake level lowered, a similar hinterland and mountain vegetation persisted. However, in the lowland area, an *Alnus* and lythraceous/*Sonneratia*- dominated swamp could have developed. This kind of swampy condition is suited to the accumulation of peat which accounts for the thick bituminous coal deposit. The deposition of the mudstone and peat is thought to occur under a cool climatic condition, probably comparable to an upper montane climate in terms of present day vegetation.

Data from this study illustrates for the first time that the modern mangrove genus *Sonneratia* may have been derived from a freshwater swamp precursor. The morphology of *Florschuetzia* tp. and related lythraceous pollen recovered from the mudstone and coal units compares well with that of *Florschuetzia trilobata* and the brackish water species, *F. levipoli* and *F. meridionalis*.