

On the lowermost palynomorphs assemblage in the Kayan Sandstone from Gunung Senggi, Bau, Sarawak

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The Kayan Sandstone consists predominantly of thick-bedded to massive cross-bedded sandstone, conglomerate and siltstone, which is characteristic of deltaic environment of deposition. It overlies with slight angular unconformity on the Pedawan Formation (Upper Jurassic-Upper Cretaceous). In the study area of north of Bau, the Pedawan Formation is predominantly argillaceous, consisting of carbonaceous shale and mudstone whilst the Kayan Sandstone is characterised by arenaceous materials of fine to medium-grained cross-bedded sandstone and conglomerate.

The Pedawan and the Kayan Sandstone can be distinguished from their differences in direction of strike and dips or by their lithologies and sedimentary structures. At the base of Gunung Senggi, the rocks are mainly of shale and sandstone, and are clearly dipping towards the north and northwest direction, and therefore closely resemble the Pedawan Formation. In comparison, towards the top of Gunung Senggi, the arenaceous rocks of the Kayan Sandstone dip in the opposite direction. Muller (1968) has made an extensive palynological study and proposed several palynological zonation based on the occurrence of palynomorphs recovered from Cretaceous-Eocene sediments of west Sarawak.

During a recent visit, the rocks sequence was logged and some palynological samples were collected from outcrops along a small stream to the top of Gunung Senggi. The palynological samples were processed using hydrofluoric acid and nitric acid. The former is used to dissolve the silicate materials in the process of liberating the palynomorphs, and the latter chemical was sometimes substituted by a stronger oxidising agent of Schulze solution. Well-oxidised samples were then mixed with cellosize as a dispersal agent and dried on cover slips before mounting onto glass slides by using Canada balsam. They were studied under a transmitted light microscope and some selected palynomorphs were illustrated.

A substantial number and variety of fairly well-preserved palynomorphs were extracted from several samples. The occurrence of palynomorphs in sample GS 2/3 is relatively distinct compared to those in other samples which are very scarce and poorly-preserved. This particular palynomorphs assemblage is characterised by the main constituents of *Balmeisporites holodictyus*, *Dictyophyllidites equiexinus* and *Alisporites similis*. Some of commonly found species are *Araucariacites australis*, *Polypodiaceoisporites retirugatus* and *Reticolpites sarawakensis* together with less common species of *Ephedripites ovalis*, *Exesipollenites tumulus* and *Matonisporites* sp. This assemblage is assignable to the *Rugubivesiculites* zone (Muller, 1968) of Senonian age which is typically characterised by the presence of *Polypodiaceoisporites retirugatus* and *Retitricolpites sarawakensis*. However, a fairly high percentage of characterising species of *Distaverrusporites simplex* and *Rugubivesiculites reductus* as one of the main constituents in *Rugubivesiculites* zone, as reported by Muller (1968) are rarely found in the present samples but the species of *Polypodiaceoisporites retirugatus*, which makes the first appearance, characterises this zone.

To date, there is no *Rugubivesiculites* zone recorded in Bau area which is well-established in other areas such as Bungo-Penrissen and Lundu-Kayan. The palynomorphs assemblage from Gunung Senggi is considered to be the lowermost palynological zonation in the Kayan Sandstone and it is distinguishable from those in the Pedawan Formation which are commonly associated with the presence of dinoflagellate cysts.