

## The palynomorph assemblage from Tebedu, Sarawak: its significance on the lower boundary of *Caytonipollenites* zone

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A Cretaceous palynomorph assemblage has been recovered from some outcrop samples from Tebedu area, Sarawak. This area was mapped as Pedawan Formation which consists mainly of a thick sequence of shale, mudstone and sandstone. This rock sequence was interpreted to be deposited in a shallow marine environment. The rock sequences from three localities were logged and twenty-three high-potential palynomorph-containing samples of carbonaceous shale, siltstone and fine-grained sandstone have been collected.

Samples for palynological analyses were processed following normal procedure of palynological preparation techniques using hydrofluoric acid to remove the silicate materials, nitric acid or Schulze solution as oxidising agents and Canada balsam as mounting medium. Out of the twenty-three samples processed, five yield identifiable palynomorphs, namely sample 499, 500, 501, 503 and 504. The remaining samples contain plant remains and poorly-preserved palynomorphs. Some identified spore and pollen from the assemblage are *Araucariacites australis* Cookson, *Matonisporites crassiangulatus* (Balme) Dettmann, *Cicatricosisporites ludbrookii* Dettmann, *C. cf. dorogensis* (Potonie and Gelletich) Couper, *Balmeisporites holodictyus* Cookson and Dettmann, *Triletes cf. T. tuberculiformis* Cookson, *Spinizonocolpites echinatus* Muller, *Inaperturopollenites limbatus* Balme and *Rugubivesiculites reductus* Pierce. Dinoflagellate cysts are also commonly found in the present samples such as *Systematophora penicillata* (Ehrenberg) Sarjeant, *Litosphaeridium siphoniphorum* (Cookson and Eisenack) Davey and Williams, *Spiniferites ramosus* (Ehrenberg) Loeblich and Loeblich, *Cribroperidinium cf. edwardsii* (Cookson and Eisenack) Davey, *Hystrichosphaerina schindewolfii* Alberti and *Florentinia radiculata* (Davey and Williams) Davey and Verdier.

Most of the spore and pollen identified lack significant species, therefore the palynomorph assemblage cannot be assigned to any palynological zonation reported from Sarawak. However, the dinoflagellate cysts and some selected spore and pollen in the assemblage show some similarities with the oldest provisional palynological zonation of *Caytonipollenites* zone (Cenomanian) from Lundu-Kayan area (Muller, 1968). Dinoflagellate cysts, identified as *L. siphoniphorum*, *H. schindewolfii*, *F. radiculata* and *C. cf. edwardsii*, are confined to Aptian-Cenomanian age as recorded from outside Sarawak. Although some poorly-preserved specimens of *R. reductus* are found, the present assemblage is not assignable to younger zonations such as *Rugubivesiculites* zone because of the absence of *Polyodiaceoisporites retirugatus* which only appears for the first time in this particular zone. The presence of *Cicatricosisporites* spp. and a rather common species of *Classipollis* sp. make a closer resemblance to the *Caytonipollenites* zone. *S. echinatus*, which is reported as of Senonian or younger (Muller, 1968), identified with certainty in the present samples, which contain in assemblage of *Caytonipollenites* zone of Cenomanian age. This finding suggests that *S. echinatus* could have appeared at an earlier time, possibly during the Cenomanian, at least in Tebedu area. The remaining long-ranged spore, pollen and dinoflagellate cysts are considered as supplementary characterising species of this zone. Based on the presence of typical Aptian-Albian dinoflagellate cysts together with some selected spore and pollen, it is suggested that the examined rock sequence from Tebedu area is of Aptian-Cenomanian age. This age limit partly spans up into the *Caytonipollenites* zone as characterised by the presence of some characterising spore and pollen species. Therefore, it is more appropriate to bring down the lower limit of this palynological zone.