

RECYCLED PERMIAN PALYNOMORPHS IN UPPER CRETACEOUS ROCKS OF JAINTIA HILLS, MEGHALAYA

The Jadukata Formation represents the oldest sedimentary rock type in the Shillong Plateau. CHAKRABORTY AND BAKSI (1972) described this formation as Gumaghat while the Geological Survey of India have, since long, called it as Jadukata (unpublished report). In a recent publication, the G. S. I. (1974) have retained the original name, i.e., Jadukata Formation. Hence, to avoid nomenclatural confusion the rock types are described after the name given by the G. S. I.

Following CHAKRABORTY AND BAKSI (*l. c.*), SAH AND SINGH (1977a) who described this formation as Gumaghat, pointed out that the palynological assemblage of the formation is characterised by the dominance of a megaspore genus *Ariadiasporites*. This megaspore has been recorded from the Maestrichtian sediments of America and Europe and is considered to be an index fossil for Maestrichtian age. JAIN *et al.*, (1975) recorded a rich assemblage of fossil microplankton from this formation. Amongst them, the following dinoflagellates are characteristic: *Gonyaulacysta*, *Dinogymnium*, *Amphidinium*, *Achomosphaera*, *Hexasphaera*, *Ascodinium* and *Hystrichodinium*. Except describing one miospore genus *Striatites* sp. they have not mentioned anything about Permian mioflora.

Recent palynological study of thin carbonaceous shales from within the conglomerate belonging to Jadukata Formation along Dawki-Punktung Road, in the Jaintia District of Meghalaya, shows a mixed type of miofloral assemblage, i.e., Permian and Upper Cretaceous forms. The recycled Permian forms are represented by *Cannanoropollis obscurus*, *Parasaccites korbaensis*, *Faunipollenites*, etc. while Upper Cretaceous palynomorphs are represented by *Cyathidites australis*, *C. concavus*, *C. Minor*, *Baculatisporites comaumesnis*, *Kuylisporites lunaris*, *Leptolepidites verrucatus*, *Klukisporites punctatus*, *Cicatricosisporites ludbrookii*, *Contignisporites* sp.; *Januasporites* sp., *Coptospora* sp., etc.

The distinction in preservation of the two assemblages is well marked. The Permian palynological taxa are recycled, distorted, tilted and generally broken, especially near the periphery and at the exine. On the other hand, the Upper Cretaceous forms are comparatively well preserved, having morphological characters intact. Sedimentological study also confirms the presence of two differently sorted clastic sediments.

As regards the depositional environment, it is evident from the field observation, especially the presence of unassorted boulders and pebbles, that they were deposited on an ancient shore. The shallow marine environment is also suggested by the presence of microplankton such as *Hystrichodinium*, *Dinogymnium*, etc. as well as by the poor sorting of sediments having skewness < 1.5.

As regards the age of this formation, the indigenous palynomorphs suggest an Upper Cretaceous age. On palaeontological evidence, the overlying formation has been assigned a Maestrichtian age. The palynomorphs recorded from this formation are distinctly different from palynomorphs recorded by BISWAS (1962) and SAH AND SINGH (1977a and 1977b) from the overlying Mahadek Formation. Since it underlies the Maestrichtian rock type, it is possible that the Jadukata Formation belongs to Campanian age, if not even lower in the sequence.

The presence of fungal spores and the other indigenous palynotaxa suggest the prevalence of humid tropical climate at the time of deposition of the Jadukata Formation.

It may be pointed out that the oldest sedimentary formation so far recorded in the states of Assam and Meghalaya are of Maestrichtian age. The present discovery of even older strata of Campanian age is, therefore, of interest. Recently the presence of Campanian invertebrate fossils has also been reported by BHATTACHARYA AND BHATTACHARYA (1978) from the Upper Cretaceous lithotype of the Shillong Plateau.

As for the source area of the Permian palynological elements in the present assemblage, it may be mentioned here that no Gondwana exposures have been found so far in any of the states of Assam, Nagaland, Tripura and Meghalaya except for one isolated patch reported from the Singrimari (89°53'30"E : 25°38'35"N) in Meghalaya where besides *Vertebraria indica* (Fox, 1935) other megafossils have recently been discovered (BAROOAH *et al.*, 1975). The source area for the recycled Permian palynomorphs under discussion is the Singrimari exposure.

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