

Paper Number: 2414

First report on Trace Fossils from flysch sediments of Nagaland, Northeast India and their Significance

Rajkumar, H.S.¹, Soibam, I.² and Khaidem, K.S.³

¹Department of Geology, United College, Chandel – 795127, India, mohnarooprajkumar@gmail.com

²Department of Earth Sciences, Manipur University, Imphal – 795013

³Department of Geology, D.M. College of Science, Imphal – 795001

The Indo-Myanmar Ranges (IMR) is a broadly N-S trending arcuate fold thrust belt located between the Bengal-Assam basin in the west and the Central Myanmar basin in the east. The IMR is divided into Naga Hills, Manipur Hills, Chin Hills and Arakan Yoma [1]. The Naga Metamorphic, Cretaceous-Palaeocene Oceanic Pelagic sediments, the Cenozoic sedimentary cover in Nagaland, such as, Disang sediments (Late Cretaceous-Late Eocene) with isolated outliers of Barail sediments (Late Eocene-Oligocene), Surma sediments (Miocene), Tipam sediments (Miocene-Pliocene) and Quaternary sediments characterized the geological setting of Naga Hills. Of the above mentioned sediments, recent investigation shows that the Barail [2] flysch sediments (Late Eocene-Oligocene) and the Disang-Barail Transition (DBT) mainly of the Eocene-Oligocene Transition (EOT) contain diverse trace fossils and so far 18 ichnospecies belonging to 15 ichnogenera have been identified that can be grouped into three classic ichnofacies such as the *Skolithos* ichnofacies comprising of *Bergaueria hemispherica*, *Ophiomorpha nodosa*, *Skolithos linearis* and *Thalassinoides paradoxicus*; *Cruziana* ichnofacies consisting of *Curvolithus simplex*, *Gyrochorte comosa*, *Helminthopsis tenuis*, *Ophiomorpha nodosa*, *Palaeophycus tubularis*, *Ptychoplasma* isp., *Scolicia* isp., *Scolicia vertebralis*, *Skolithos linearis*, *Taenidium satanassi*, *Taphrhelminthopsis auricularis*, *Treptichnus pedum* and crab feeding pellets (sand spherules); and *Nereites* ichnofacies consisting of *Chondrites targionii*, *Ophiomorpha rudis*, *Paleomeandron elegans* and *Taphrhelminthopsis auricularis*. These trace assemblages especially the *Skolithos* and *Cruziana* ichnospecies commonly imply significant and complex wave activity in the sublittoral marine setting to offshore setting with relatively nutrient-rich, fine-grained sediments deposited in low-energy environments. The presence of sand spherules (crab feeding pellets) also suggests a shallow-water environment like intertidal shorelines [3]. Moreover, the associated coarsening upward sequences usually typified by sedimentary structures also signify regressive marine setting with a shallow regime as indicated by occurrence of climbing ripples, pot casts, herringbone structures, cross-beds, etc. On the other hand, the presence of *Nereites* ichnofacies indicates distal offshore marine setting, thus implying that the depositional environment in which the Barail flysch sediments deposited might fluctuate periodically, that is, shallowing and deepening (related to pulsatory crustal stretching). Besides, the sediments are also observed to contain various leaf impressions mainly of Dipterocarpaceae and Palmae families which support the possible fact that the Barail flysch basin extended from marginal foreshore [4] areas to proximal depositional lobe of deep-sea fans as indicated by the presence of *Ophiomorpha rudis* [5].

References:

- [1] Brunnschweiler R O (1974) Geological Society of London, Special Publication 4:279-299
- [2] Evans P (1932) Trans. Mining and Geology 27:155-260
- [3] Šimo V and Starek D (2015) Palaeogeography Palaeoclimatology Palaeoecology 438:364-378
- [4] Khaidem et al. (2015) Journal Earth System Science 124(5):1085-1113
- [5] Uchman A (2009) Palaeogeography Palaeoclimatology Palaeoecology 276(1):107-119

