

The importance of nummulites and assilina in the correlation of middle and upper Eocene rocks

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The abundance and identification of the fossil forams was investigated in the Kohat Formation (U. Eocene), Kuldana Formation (U. Eocene) and the Chorgali Formation (M. Eocene) exposed in Kala Chitta and Margalla Ranges and representing the unstable and fluctuating environments of the vanishing Tethys Sea during the collision of the Indian and Eurasian subcontinents. The Kohat Formation and Kuldana Formation are missing further south towards the Salt Range where the marls and argillaceous limestones of the Chorgali Formation are unconformably overlain by the continental sediments of Rawalpindi Group of Miocene age. The limestones and marls of the oldest Chorgali Formation and youngest Kohat Formation represent marine environments with abundant fossil forams and other marine fauna, while the red shales and sandstones sandwiched Kuldana Formation display continental environments with vertebrate fossils of mammals and reptiles. The Kuldana Formation also occasionally displays thin bands of limestones/marls, representing the unstable environmental conditions.

The detailed studies of fossil forams in these formations

indicate the presence of mostly nummulites and assilina. The nummulites are abundant and dominant in the Chorgali Formation and in band intercalated with the continental sediment of the Kuldana Formation while assilina are subordinate. On the other hand, the assilina are dominant in the Kohat Formation with subordinate nummulites.

The fossil forams found in the Eocene rocks exposed in Kala Chitta Range, Margalla Range and Salt Range were compared and correlated with the forams found in the top beds of the Kirthar Formation, exposed further south at a distance of more than 1000 km, at Kotdiji, Khairpur and Rohri in the Sindh Province of Pakistan. The abundant limestone abundantly in Kirthar Formation display mostly with some assilina. It is most likely that the nummulites beds at the top of Kirthar Formation represent the same environment and time as the Chorgali and Kuldana Formations exposed in the north and younger beds at the top of Kirthar Formation are equivalent to Kohat Formation were eroded away during uplifting in the Oligocene times.