

A note on Foraminifera from the Jurassic rocks of Central Kutch

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In India, marine fossiliferous rocks of Jurassic age are developed at a few places and Kutch is one of them. They occur extensively and are very well exposed in this region and thus provide an excellent opportunity for the study of Jurassic rocks belonging to the Tethyan realm. These rocks have yielded a fascinating suite of invertebrates, including ammonites, resulting in the publication of excellent monographs on the Jurassic megafossils. The present knowledge of the Jurassic rocks of Kutch is primarily based on the findings of paleontologists who made detailed taxonomic studies on the fossils and contributed substantially in building the stratigraphic sequence, age determination, and correlation.

The first report on the foraminifera from the Jurassic (Patcham) rocks of Kutch was made by Tewari (1957) who noted the presence of *Aulotortus*, *Textularia*, *Bigennerina*, *Spiroplectamina*, and *Gaudryina*. Agrawal and Singh (1960) recorded *Rhabdammina*, *Ammodiscus*, *Ammobaculites*, *Quinqueloculina*, *Triloculina*, *Robulus*, *Lenticulina*, *Nodosaria*, *Saracenaria*, *Vaginulina*, *Palmula*, *Nonion*, *Elphidium*, *Rotalia*, and *Anomalina* from the Habo beds of Walakhawas Trnk and Fakiwari, near Bhuj. They were followed by Subbotina *et al.* (1960) who described thirty-four species of Jurassic (Callovian-Oxfordian) foraminifera from Kutch and Rajasthan regions.

In view of the foregoing, the present authors prepared a detailed plan for the study of microfossils, especially foraminifera, from the Jurassic rocks of Kutch and a beginning was made by making a comprehensive study of foraminifera from a very well-developed sequence, representing Patcham and Chari series and exposed on the northern flank of Habo hills in Central Kutch. The present note gives an advance account of the main findings of the authors.

A large population of foraminifera comprising sixty-five species was recorded from the present material. The species in the present assemblage common to the finding of earlier workers are: *Astacolus anceps* (Terquem), *A. cf. A. aphrastus* Loeblich and Tappan, *Citharina clathrata* (Terquem), *Citharinella* aff. *C. latifolia* Loeblich and Tappan, *Lenticulina* cf. *L. munsteri* (Roemer), *L. quenstedti* (Gümbel), *Marginulina cryptospira* (Paalзов), *Patellinella poddari* Subbotina and Srivastava, and *Trocholina* cf. *T. conosimilis* Subbotina and Srivastava. The other species of foraminifera, including ten new and some indeterminate species, which were recorded for the first time from Kutch Jurassics by the authors, have been reported in a recent paper (Bhalla and Abbas, 1975).

The bulk of the species belong to the family Nodosariidae constituting 61.5% of the total population. This is followed by Lituolidae 18.4%, Miliolidae 7.6% and 1.5% each of Ammodiscidae, Rzehakinidae, Textulariidae, Ataxophragmiidae, Bolivinitidae, Discorbidae, Spirillinidae and Involutinidae.

The application of the principle of uniformitarianism in the precise paleo-ecological deduction of the pre-Tertiary foraminiferal assemblages is generally

misleading and this makes it difficult to interpret the depositional environment of the Kutch Jurassics on the basis of foraminifera alone. Furthermore, certain portions of the studied section are barren of foraminifera. This necessitated a petrographical study of the rock samples for drawing paleoecological conclusion. The foraminiferal evidence, in collaboration with petrographical data, provides a fairly accurate basis for the interpretation of paleoecology and suggests that the overall deposition of the sediments took place in a near-shore, shallow-water, marine basin which fluctuated considerably between lagoonal, neritic and littoral environments from time to time.

The foraminiferal assemblage of the Kutch Jurassics is rich both in the variety and number of species but, by and large, it is rather endemic and makes a little contribution towards the precise fixation of age. However, on the basis of certain well-known species, viz., *Verneulinoides tryphera* Loeblich and Tappan, *Nodosaria daedala* Loeblich and Tappan, *Astacolus* cf. *A. aphrastus* Loeblich and Tappan, *Citharinella* aff. *C. latifolia* Loeblich and Tappan, *Dentalina gumbeli* Schwager, *Marginulina cryptospira* (Paalzow), *Patellinella poddari* Subbotina and Srivastava, and *Trocholina* cf. *T. conosimilis* Subbotina and Srivastava, a Callovian to Oxfordian age has been suggested for the studied sequence.

The foraminiferal population of the Jurassic rocks of Kutch compares well with the Jurassic assemblages described from Egypt, Iran, Afghanistan, Rajasthan and Somalia and has Tethyan affinities. This lends credence to earlier views based on megafaunal evidence that during the Middle and Upper Jurassic times, an arm of the Tethys extended from near Iran to Madagascar which engulfed Afghanistan, Rajasthan, Kutch and east coast of Africa.

References

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