

POST-JURASSIC ELEMENTS IN THE JURASSIC FORAMINIFERAL ASSEMBLAGE FROM KUTCH

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Kutch is a famous locality for the richly fossiliferous marine sequence of Jurassic rocks. These strata have attracted the attention of geologists due to their wealth of megafaunal assemblage, especially the ammonites. Although microfossils, especially foraminifera, are equally abundant, no serious attention has been paid to their study. It was, therefore, considered necessary to make a detailed investigation of the foraminifera from these rocks and our efforts revealed the presence of a fascinating suite comprising 65 species of foraminifera from the Jurassic sequence exposed at Habo hills in Central Kutch.

During the course of the present study, the authors observed the presence of some post-Jurassic elements along with characteristic Jurassic species in the assemblage and this anomalous occurrence demanded a careful assessment of the entire foraminiferal faunal evidence.

The post-Jurassic elements of foraminifera in the present assemblage include, *Neobulimina* sp., ?*Gavelinella* sp., *Cibicides* sp., *Gabonella* sp., *Elphidium* sp., *Nonion* sp., *Nonionella* sp., ?*Ammonia* sp., *Florilus* sp., *Cibicidina* sp., *Amphistegina* sp., *Asterigerina* sp., and *Alveolinella* sp. (Fig. 1). These are represented by a small number of specimens which are almost worn out with obliterated morphological features and frosted surface and their shape has generally become well-rounded. On the other hand, the Jurassic foraminifera are abundant, well-preserved and clearly show the morphological features without any evidence of strain on their shape.

The presence of Tertiary element, e.g., *Elphidium*, in the Jurassic rocks of Kutch has earlier been observed by Agrawal and Singh (1960) who listed a meagre foraminiferal assemblage consisting of 15 genera from the Jurassic strata exposed near Walakhawas Tank and Fakirwari. Although these authors pointed the unusual presence of *Elphidium*, essentially a Tertiary genus, they did not offer any explanation for the occurrence of this abnormal find.

The Jurassic rocks of Kutch contain abundant Jurassic ammonites which have been extensively used in framing the stratigraphic sequence and its correlation with the standard Jurassic succession in Europe. The strata exposed at Habo hills from which the present foraminiferal collection was made, are of Jurassic age, for not only do they yield abundant and perfectly preserved Jurassic megafossils, including ammonites, but also contain Jurassic foraminifera. Moreover, Habo is a famous Jurassic locality in Kutch where the sequence is very well-developed and exposed and which stimulated Agrawal (1957) to substitute the word Habo for the Chari series—an important division of the Jurassic sequence of Kutch. This confirms that the strata under investigation are undoubtedly Jurassic. The solution of the problem then lies in a closer study of the post-Jurassic elements of foraminifera in our assemblage.

In the present collection, the post-Jurassic foraminifera were observed only in loose and weathered outcrops of the Jurassic rocks and none were recovered from compact samples. Also, they were not found to be confined to any particular bed but occurred throughout the entire exposed area. Such a mode of their occurrence suggests that they are not indigenous but somehow 'leaked' into the Jurassic rocks.

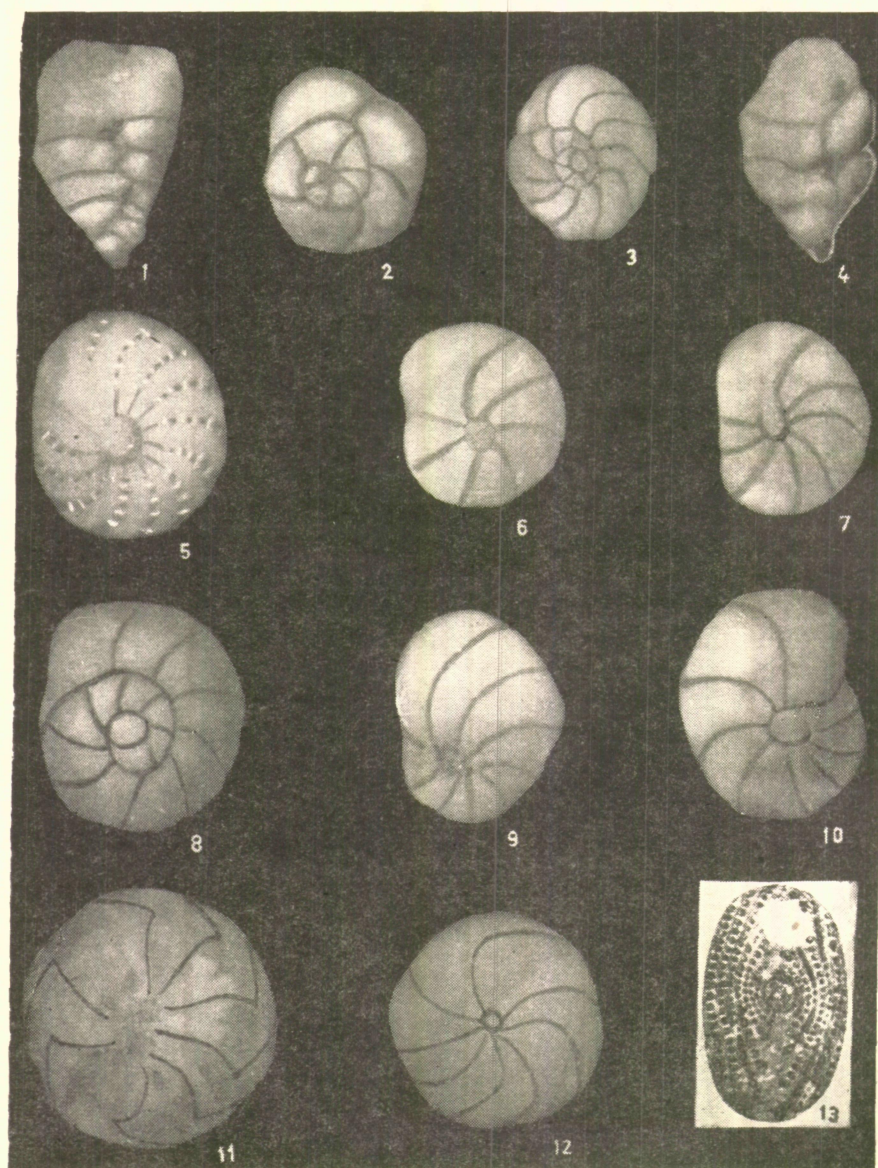


Figure 1.

All figures $\times 85$ unless otherwise indicated.

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| 1. <i>Neobulimimina</i> sp. | 8. ? <i>Ammonia</i> sp. |
| 2. ? <i>Gavelinella</i> sp. | 9. <i>Florilus</i> sp. |
| 3. <i>Cibicides</i> sp. | 10. <i>Cibicidina</i> sp. |
| 4. <i>Gabonella</i> sp. | 11. <i>Amphistegina</i> sp. |
| 5. <i>Elphidium</i> sp. | 12. <i>Asterigerina</i> sp. |
| 6. <i>Nonion</i> sp. | 13. <i>Alveolinella</i> sp., axial section, $\times 60$ |
| 7. <i>Nonionella</i> sp. | |

It may be argued that in Kutch, the sea remained stationed or transgressed off and on from Jurassic onwards, i.e., up to Pliocene times, resulting in the accumulation of Tertiary strata over the Jurassic rocks. Thereafter, the post-Jurassic sediments were eroded away and, during the process, their foraminifera leaked into the underlying Jurassic strata. If this were so, one should expect at least some remnants of post-Jurassic sediments over the Jurassic rocks, but none have been observed so far. The post-Jurassic elements of foraminifera are confined to the weathered outcrops only. The compact samples are free from them. The possibility of leaking from the once overlying post-Jurassic rocks therefore can be ruled out.

Kutch is bounded by beaches on the western and southern margins and marine Tertiary rocks are developed and well-exposed in its northwestern part. As discussed earlier, the post-Jurassic elements show perfectly rounded and abraded tests and exhibit the characters of wind-borne sediments. It is most likely that during summer months when strong westerly winds and dust storms prevail in this arid region, the post-Jurassic foraminifera along with other material, were blown from the western and northwestern parts of Kutch and sprayed over the Jurassic exposures present in the eastern sector. Thereafter, they impregnated the Jurassic sediments through percolating water during rainy season and got entombed in the sediments as 'leaked' material.

This explains the presence of post-Jurassic elements of foraminifera in the Jurassic rocks of Kutch. This association may also occur at other Jurassic exposures in the region and great caution is required in the interpretation of age, palaeoecology and correlation of Jurassic rocks based on foraminifera and other microfossils.

References

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GENETIC CLASSIFICATION OF MATRIX OF PANCHET SANDSTONES, RANIGANJ COALFIELD, WEST BENGAL

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Introduction: Correct estimation of amount of matrix deposited as clastics during sedimentation helps in understanding the hydrodynamic picture of deposition. Panchet sediments have been subjected to diverse diagenetic activity. The original water-worn boundary of the sand sized clastics are affected imparting corroded margins to the latter and in extreme cases, the sand grains are totally masked or replaced by diagenetic products. Compaction of softer particles between competent clastics producing a new packing mode of greater stability under a thick pile of sediments and their subsequent chemical degradation leads to the appearance of matrix which was not originally present during sedimentation. Failure to recognise these