The Jurassic ostracode fauna of Bela Island, Rann of Kachchh, Gujarat

The Jurassic ostracodes of Kachchh were first described by Lymbimova and Mohan (see ref. 1), who recorded eight species (all new) from two localities, Khavda and Lodai. Later, there were several publications on these ostracodes from Kachchh Mainland and adjoining Banni Rann.² As far as the Northern Island Belt comprising Pachchham (except Khavda), Khadir, Bela and Chorar islands, localities south of Bhuj town are concerned, no work was done on the Jurassic ostracode fauna. Hence in 1999, one of us (S.C.K.) (S.C.K.) under a DST-sponsored research project initiated the study of Jurassic ostracodes from different stratigraphic sections covering the entire Kachchh district. As a consequence recently Khosla et al.³ have recorded 54 ostracode species from the type section of the Khadir Formation, i.e. Khadir Island. The present correspondence deals with ostracode fauna from the Jurassic beds of the Bela Island. The samples from which ostracode fauna are being recorded come from five sections which are as follows (Figure 1): Section I, exposed along Lodranikuda track, north of Lodran village (2354'29"N, 7037'25"E) (samples BI/135). Section II, exposed at about 1 km NW of

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Figure 1. Sketch map of Kachchh showing location of Bela Island and Sections I–V sampled.

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Figure 2. (A. Length in mm; LV, Left valve view; RV, Right valve view). 1. Cysteella distansza Lyubimova and Mohan, LV, L 0.66; 2. C. obscura Lyubimova and Mohan, LV, L 0.64; 3. Cytherelloidea badiensis Khosla et al., LV, L 0.55; 4. C. iheringensis Khosla and Jaiachar, LV, L 0.68; 5. C. ipis Grekoff, LV, L 0.60; 6. C. paradysforma Khosla et al., LV, L 0.52; 7. Bairdia badiensis Khosla et al., RV, L 0.73; 8. B. ibarraensis Khosla et al., RV, L 0.72; 9. Procytheridea thayvensis Grekoff, RV, L 0.75; 10. Amicytheridea triangularata Bate, RV, L 0.56; 11. Barcella befoataeensis (Grekoff), RV, L 0.66; 12. B. clavata Khosla et al., RV, L 0.58; 13. B. depressa Khosla et al., RV, L 0.60; 14. Habocythere bicincutata (Grekoff), RV, L 0.62; 15. H. dorsoangulata (Grekoff), RV, L 0.41; 16. H. malgachica (Grekoff), RV, L 0.41; 17. Jaitiana retusa (Grekoff), RV, L 0.66. 18. Lophocythere verticilicostata Khosla and Manisha Kamari, RV, L 0.67; 19. Nymphocythere jaivasalmerensis (Kalshershi, Singh and Tewari), LV, L 0.80; 20. N. whatleyi Khosla et al., RV, L 0.37; 21. Progonocythere laveiscula Lyubimova and Mohan, RV, L 0.66; 22. Trichordis (Trichordis) gujaratensis Khosla et al., RV, L 0.73; 23. T. (Paratrichordis) devaexa (Grekoff), RV, L 0.48; 24. T. (P.) grumosa (Lyubimova and Mohan), RV, L 0.58; 25. Mesocythereida? mathari Khosla et al., RV, L 0.77; 26. Mandelstamia depecheae Khosla et al., RV, L 0.58; 27. Cytheropterina deva Khosla et al., LV, L 0.47; 28. C. pandeyi Khosla et al., RV, L 0.43; 29. Cytheropteron kuchchensis Neale and Singh, RV, L 0.51; 30. Paracypris contermina Lyubimova and Mohan, RV, L 0.75; 31. Paracypris salmiformis Neale and Singh, RV, L 0.77.
Gadhada Ruins (23°54'17"N, 70°41'30"E) (samples BII/1–10). Section III, exposed along a stream about 1 km northwest of Bela village (23°52'35"N, 70°48'13"E) (samples BII/1–12). Section IV, exposed along a north–south trending stream, in northern escarpment of hill range, near Bela village (samples BIV/1–13). Section V, exposed along northern and southern escarpments of Mouvana Hill (23°49'50"N, 70°52'03"E) (samples BV/1–17).

All the sections have yielded a rich and well-preserved ostracode fauna comprising 57 species. The object of the present correspondence is to place this assemblage on record. The systematics of the fauna is in hand and will be published elsewhere.

The stratigraphy of eastern Kachchh, of which Bela Island is a part, has been discussed in detail, among others, by Biswas. He grouped the Mesozoic beds of this region in three rock-units and designated them as Khadir Formation, Washatwa Formation and Wagad Sandstone after their respective stratotypes. The Khadir Formation represents the oldest unit in the region and is exposed in Khadir, Bela and Chorar islands. The other two units are exposed in Wagad area. The Washatwa Formation corresponds to the upper part of Khadir Formation, while the Wagad Sandstone is the youngest unit. Biswas (op.cit.) subdivided the Khadir Formation into five members. They are, in ascending order, Cheriya Bet Conglomerate Member, Hadibhadjang Shale Member, Hadibhadjang Sandstone Member, Gadhada Sandstone Member and Bambhanka/Ganga Member.

In the Bela Island, the Cheriya Bet Conglomerate Member is not exposed. The succession starts with the upper part of the Hadibhadjang Shale Member. The highest Jurassic beds here belong to the basal part of the Gadhada Sandstone Member. The Hadibhadjang shales are exposed all along the northern slopes of the escarpment of the hill range on the northern margin of the Bela Island. The Hadibhadjang sandstones form the upper part of the escarpment, the hard limestone bed, locally containing lenses of golden-oolites, being at the top. The Gadhada sandstones form the back slope of the escarpment.

Of the ostracode fauna recorded herein, 31 species are assigned to previously known taxa (Figure 2). Twenty-six species are left under open nomenclature, a majority of which may be new. They belong to one species each to the genera: Batella, Citrella, Cytherelloidea, Darwinula, Dhrumana, Eucytherura, Metacytheropteron, Mesocytheridea?, Morkhovenicytheres, Para-cypris, Paramocytherulae and Pirileberis; two species each to the genera: Bairdia, Naphreycythere, Mandaucytherula and Monoceratina; and three species each to the genera: Habocythere and Mandel-stamia. Based on their stratigraphical distribution, four assemblage zones have been proposed herein for the Jurassic beds of the Bela Island (Table 1).

The two lowermost zones are new to the Northern Island Belt, and beds equivalent to these zones are, perhaps not encountered in the Kachchh Mainland. P. laeviscula Assemblage Zone is distinct and clearly traceable in Habo, Jhura and Jamara domes of Kachchh Mainland, where numerous species are common to the Bela Island. The topmost zone, sensu stricto, also does not occur in the Kachchh Mainland. However, based on stratigraphic position, it can be correlated with the Zone II – Poorly Fossiliferous Zone of Khosla et al., described from the Habo Hill.

The beds of the two lowermost zones were deposited in brackish-water environment during the initial phase of marine transgression; the P. laeviscula Assemblage Zone in sublittoral environment, and the uppermost zone in brackish-water condition of regressive phase.

Like the Kachchh Mainland, ostracode fauna of the Jurassic beds of the Bela Island shows strongest affinity with those of the Majunga Basin, Madagascar and to a lesser extent with those of Tanzania, Central Saudi Arabia and Israel.


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<table>
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<th>Age</th>
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<td>Sandstone</td>
<td>Habocythere sp. B Assemblage Zone</td>
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<tr>
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<td>Khadir</td>
<td>Sandstone</td>
<td>Progonocythere laevisula Assemblage Zone</td>
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<tr>
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</tr>
<tr>
<td>Balkhonian-Bajocian</td>
<td>Shale</td>
<td></td>
<td>Nophreycythere sp. A Assemblage Zone</td>
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Table 1. Stratigraphical succession and proposed ostracode zones of Jurassic beds of Bela Island.