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Miocene instead of Jurassic: the importance of sound fieldwork for paleontological data analysis—a reply

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In their detailed comments, Das et al. (2023) try to discount our arguments that the strata cropping out at the so-called Jhura pond locality are not Late Jurassic in age but Miocene. We wrote this paper (Fürsich et al., 2023) because of the far-reaching conclusions that have been drawn from the molluscan fauna at that locality, in particular with respect to the evolution of turritellid gastropods and the evolution of drilling predation by naticid gastropods. We still maintain that the beds containing abundant turritellids are not Jurassic but Neogene, most probably Miocene, in age. In no way do we contest the various analyses on the material collected from the outcrop by the authors, but just the erroneous age assignment of the strata. In order to keep this reply short, we support our point by referring to just to two aspects: the position of the outcrop and the composition of the fauna. Rather than refuting each of the other arguments of Das et al. (2023), we think that a joint visit to the locality would be more productive for arriving at a consensus on the origin and age of the fauna of the Jhura pond locality.

According to the new coordinates of the locality given by Das et al. (2023), our section (Fürsich et al., fig. 2) is in fact approximately 200 m away along strike, exhibits a similar bed geometry, and thus can be assumed to represent the same stratigraphic unit. The closest outcrop of the Dhosa Oolite with a clear Late Jurassic (Oxfordian) age is situated 1.5 km towards the southwest, where it can be followed almost continuously along the edge of the Jhura Dome. Without doubt, the fauna described by Das et al. (2023) from the Jhura pond locality contains some Jurassic (Oxfordian) ammonites, belemnites, and brachiopods, albeit worn and preserved as fragments (e.g., Das et al., 2023, fig. 5). During the Miocene, they could have become reworked and mixed with sediments and faunal elements from that time interval (in case they occur in situ). If found loose, they could have been transported more recently from the present-day outcrops of the Oxfordian Dhosa Oolite 1–2 km away by flash floods. In the same way, iron-oolitic pebbles and poorly cemented iron-oolitic marly silt separating the well-cemented beds of the Dhosa Oolite could have become mixed with younger sediments. This would explain the unique occurrence of some iron ooids in Miocene strata.

An even more compelling argument is that the pond section would be the only place in all of the Kachchh Basin where abundant turritellid gastropods occur in Jurassic strata, whereas less than 2 km away, the Jurassic rocks do not contain a single turritellid specimen, nor do they contain any of the associated bivalves. The bivalves figured by Das et al. (2023, fig. 10) have not been recorded from any of the Jurassic sections of the basin. Moreover, one of us (SB) revisited the locality together with K.G. Kulkarni from the Agharkar Research Institute in Pune, who has extensively worked on Miocene molluscs from Kachchh. During this visit she collected some bivalves at the pond locality among them *Placuna* (*Indoplacuna*) *sindiensis* Vredenburg, 1924. This bivalve has been described from the Claystone Member of the Miocene Chhasra Formation in western Kachchh (Kulkarni et al., 2009). Neither the genus nor the subgenus has been recorded from Mesozoic rocks so far. Similar to *Indoplacuna* from western Kachchh, the specimen is encrusted with barnacles.

In summary, no explanation has been offered by Das et al. (2023) as to how a benthic fauna with such a unique composition could have existed at just a single locality in the Kachchh Basin and merely 1.5 km away from coeval beds that exhibit a completely different character. The occurrence of turritellid gastropods, the benthic foraminifera, and the undoubtedly Miocene bivalve strongly support a Miocene age of the rocks under discussion.

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