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The origin and early evolution of planktic foraminifera

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In the 1960s and 1970s Oberhauser and Fuchs described a range of new species from Austria, Northern Italy and Poland that were described as the “earliest” planktic foraminifera. Since the publication of these papers there has been a debate as to the validity of both the species and the interpretation of them as the earliest part of the Mesozoic plankton. Some authors have dismissed them, almost out of hand, while others have defended them as the ancestral forms of the planktic foraminifera.

In the last two years all the type specimens have been inspected and photographed in an environmental SEM. This has allowed the close matching of the original drawings (almost all of which are very accurate) with the new photographs. The evolutionary trends detected by Fuchs are almost certainly correct, although it is clear that the majority of the taxa are benthic in character. That said, it is also clear that *Oberhauserella* and *Praegubkinella* are possible ancestors of the Jurassic planktic fauna that appears at, or about, the level of the Toarcian oceanic anoxic event in Europe. Records of such taxa in other parts of the world (*e.g.*, N.W.Australia – Apthorpe [*pers. comm.*]) have still to be fully assessed. It is quite clear that, by the Bajocian and Bathonian (in the Middle Jurassic) there was a relatively diverse fauna of *Conoglobigerina* (and possibly *Globuligerina*) present in oceanic sediments deposited over a wide area of the Tethyan Realm. In the mid-Upper Jurassic this fauna diversified and expanded its range as new ocean basins (*e.g.*, the North Atlantic Ocean) developed. In places, such as the Carpathians of Southern Poland, some of these Jurassic limestones yield assemblages that can only be described as Jurassic “*Globigerina* ooze”, so abundant is the fauna. There are very rare occurrences in the Upper Jurassic, but across the Jurassic-Cretaceous boundary the record is very incomplete. This gap in our knowledge is quite critical as the Jurassic taxa are regarded as being aragonitic in test composition, while those in the Lower Cretaceous are calcitic.

While there are still many questions to resolve, new data from Jurassic sediments throughout Europe are providing answers to the evolution of the planktic foraminifera.