Microfauna (conodonts, shark and fish teeth) and stable isotope geochemistry from the Middle Triassic (Upper Anisian-Lower Ladinian)

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All over the Germanic Basin, sediments known as Muschelkalk were deposited during the Middle Triassic. They are characterized by brachiopods and bivalves in rock-forming quantities as well as by a well-studied ceratite fauna, which allows a basin-wide correlation. The present study focuses on the Upper Anisian and Lower Ladinian (Upper Muschelkalk). The 90 m thick successions crop out near Stuttgart (SW Germany) and comprise bioclastic limestones as well as fine-grained, argillaceous limestones.

The data presented herein concentrated on the microfauna and stable isotope geochemistry in SW Germany. The microfauna consists of brachiopods, bivalves, fish and shark teeth, bones, scolicodontes, placoids, and conodonts. While conodonts are less abundant or even absent in fine-grained limestones, they are relatively high abundant in bioclastic limestones, and accumulations of conodonts were observed in ammonoids collected in the studied outcrops. Well preserved and big conodonts were found in stratigraphic older levels, whereas small-sized, poorly preserved and low-abundant specimens were collected from younger stratigraphic levels. This faunal change obviously occurs around the Cycloidesbank, a marker bed yielding masses of brachiopods *Coenothyris cycloides*. Therefore, a detailed bed-by-bed sampling, as well as carbon isotopes of micrites and oxygen isotopes of phosphate to reconstruct changing salinity and sea-water temperature were conducted below and above the Cycloidesbank. This aimed at a precise study of the faunal content and a reconstruction of environmental changes at this level, and helps to record migrations, immigrations or endemisms.

Bony and cartilaginous fishes from the Germanic Basin are mainly represented by isolated material such as teeth and scales. Partly preserved dentitions are also present but very scarce. All teeth and scales measure only a few millimeters in size leading to the assumption that the fishes were small with only a few dozens of centimeters in total length. The selachian fauna mainly consists of hybodont taxa, the extinct sister-clade to all extant sharks, skates and rays. Hybodontiformes were the most diversified cartilaginous fishes during the Palaeozoic and Early Mesozoic, dominating contemporaneous chondrichthyan faunas. The Muschelkalk shark assemblage presented herein is in fact very small concerning the specimens' size but diverse comprising very early representatives of a few hybodont groups, which were quite successful during the ensuing Mesozoic periods. Preliminary data of oxygen isotope values ($\delta^{18}O$) indicate low values between 15 and 19.5 ‰ $\delta^{18}O$ (V-SMOW) in the Germanic Basin, while, in comparison, values measured from time-equivalent Tethyan faunas are relatively high, and vary between 17.5 and 22.5 ‰ $\delta^{18}O$. Also, differences in the oxygen isotope values from coeval beds were measured between conodont apatite, fish and shark teeth, placoids, brachiopods, and scales. While values from conodonts, brachiopods (Lingula) and teeth crowns are highest, values from complete teeth, placoids and other scales, as well as from teeth without crowns are lowest. Therefore, diagenetic overprint can not be excluded especially for the lowest values, while the differences in oxygen isotope values between the Muschelkalk and the Tethyan faunas can be related to salinity and/or temperature.

To what extent the particular and changing environmental conditions of the Muschelkalk basin favored dwarfed fauna or were triggering the origin and/or radiation of specific vertebrate taxa still is ambiguous and need further comparative studies of faunal assemblages including geochemical analyses considering, i.e., changing salinities.

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Freshwater sharks (Chondrichthyes, Hybodontiformes) from the Late Jurassic Junggar Basin (Xinjiang, NW China)

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Hybodontiformes is an ancient group of cartilaginous fishes and sister to all living sharks, skates and rays, the Neoselachii. They formed an important component of Palaeozoic and Early Mesozoic fish faunas and occupied higher positions in trophic food webs. In the Triassic, they flourished and inhabitated a wide range of ecosystems from fully marine to fully freshwater environments. Most hybodont are reported from the Northern Hemisphere (Europe, North America), which, however, undoubtedly represents a collecting bias. Consequently, the knowledge of Mesozoic hybodont sharks from other parts of the world, especially