



Chemo- and biostratigraphy of the Late Jurassic from the Lower Saxony Basin, Northern Germany

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The upper Jurassic (Oxfordian to Tithonian) sediments of the Lower Saxony Basin (Northern Germany) comprises a succession of limestones, marlstones and claystones deposited in a shallow marine to lacustrine epicontinental basin situated between the Tethys and the Sub-Boreal seas.

Both, the depositional environment and the palaeogeographically isolated position strongly compromise a chronostratigraphic dating of the regional lithostratigraphical and biostratigraphical units.

In order to obtain a stratigraphic standard section for the Late Jurassic of the Lower Saxony Basin we drilled a 325 m long core (Core Eulenflucht 1) covering the lower part of the Berriasian (Wealden 2-3 of the Bückeberg Formation) to the lower Oxfordian (Heersum Formation). A compilation with a section outcropping in an active quarry 2 km north of the drill site resulted in a 340 m long section reaching down to the late Callovian (Ornatenton Formation).

Ammonites have only been described in the lowermost, Callovian part of the section. Investigations of benthic foraminifers, ostracods as well as palynology, however, allowed for a rather detailed biozonation of the core. These data indicate the stratigraphical completeness of the section when compared to the regional stratigraphic data of the Lower Saxony Basin.

Due to the lack of ammonites in Late Jurassic part of the section, which would have allowed for a correlation with Tethyan successions, high resolution stable carbon isotope data have been produced from bulk rock carbonate. Even though most of the data derive from shallow marine, rather coarse grained carbonates, such as oolites and floatstones the resulting carbon isotope curve is surprisingly clean with only little “noise” in the upper part (early Tithonian?) of the measured succession. The curve clearly shows some distinctive features reported from biostratigraphically well-dated carbon isotope records of the Northern Tethys (e.g. Bartolini et al., 2003, Padden et al., 2002, Rais et al., 2007) and the Sub-Boreal (Nunn et al., 2009, Nunn & Price, 2010). Therefore it allows for a correlation of isotope excursions such as the pronounced mid-Oxfordian positive and the two brief negative excursions of the mid-Oxfordian, the broad positive excursion in the late Oxfordian and a general trend towards light values starting at the Kimmeridgian-Tithonian boundary. This results in a chronostratigraphic re-interpretation of the Oxfordian to lower Tithonian litho- and biostratigraphic units in the Lower Saxony Basin, details of which are presented on our poster.