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Foraminiferal zonation of early Oligocene deposits (Selztal Group, Latdorfian, Rupelian) in the Mainz Basin, Germany

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ABSTRACT – The foraminiferal zonation reported here is valid for the marine Oligocene deposits in the Mainz Basin. Thirteen zones and one subzone are defined in the basin facies, which may be correlated biostratigraphically with the current nannoplankton zones and also lithostratigraphically. The zonation for the beach facies, already described by the present author, is incorporated into the scheme. It is possible, therefore, to generate a high resolution foraminiferal biostratigraphical subdivision of the marine Oligocene deposits of the Mainz Basin. *J. Micropalaeontol.* **21**(1): 67–74, May 2002.

INTRODUCTION

The Lower Oligocene deposits of the Mainz Basin (*sensu* Golwer, 1968) are composed of siliciclastic sediments comprising the Pechelbronn Beds, the Bodenheim, the Alzey and the Stadecken formations and the lower part of the Sulzheim Formation, as reported by Grimm *et al.* (2000). The Bodenheim, Alzey, Stadecken and Sulzheim formations are combined with the Budenheim Formation of Chattian age (Schäfer & Kadolsky, 1998), to form the Selztal Group (Grimm *et al.*, 2000). The stratigraphic sections examined (Fig. 1) ranged from the Middle Pechelbronn Beds at the base to the Stadecken Formation at the top (see Fig. 2). The marine-brackish to limnic Pechelbronn Beds, first described lithologically by Steuer (1910), in the Mainz Basin have previously not been studied biostratigraphically in detail, but they were investigated by Barth (1969) in the Rhine Graben at the locality of Rot-Malsch.

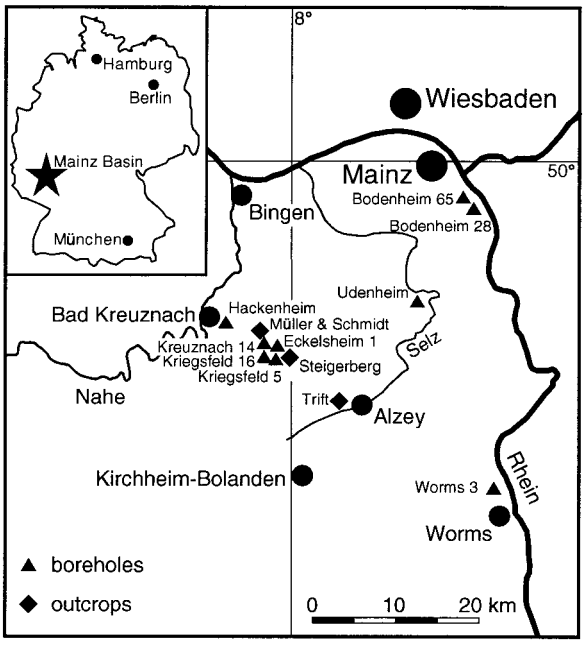

Fig. 1. Map of the Mainz Basin with location of boreholes and outcrops.

The basal clays of the Bodenheim Formation, formerly known as Rupelton, were first investigated biostratigraphically and subdivided by Spandel (1909) into the Lower Rupelton (=Foraminiferenmergel), the Middle Rupelton (Fischschiefer) and the Upper Rupelton. Additional studies made by Doebl (1956), Volk (1956), Thursch (1956) and Sonne (1988) have been followed by detailed biostratigraphical work by Grimm (1991, 1994, 1998).

The coastal gravels and sands of the Alzey Formation, formerly known as Meeressand, were first subdivided into two foraminiferal zones by Grimm (1998).

The Stadecken Formation, the former Schleichsand, has been investigated by Sonne (1988) and Kammerer (1993).

The biostratigraphical zonation based on foraminifera reported herein summarizes the detailed studies carried out during the last ten years on a collection of samples from more than 100 outcrops and boreholes, and updates this zonation not only to a modern international standard, but also combines a modern lithostratigraphical subdivision of the Mainz Basin with a detailed foraminiferal zonation.

DEFINITION OF FORAMINIFERAL ZONES

The following foraminiferal zones (Figs 2 and 3) are defined as biozones according to Salvador (1994) and Steininger & Piller (1999). In the present study, 13 Biozones and 1 Subzone are established.

The studied stratigraphic section comprises the upper part of the international smaller benthic foraminiferal zone NSR 7a=Zone of *Adercotryma agterbergi* and the major part of NSR 7b=Zone of *Turrilina alsatica*after Hardenbol *et al.* (1998). *Adercotryma agterbergi*, a very small species, is seldom present in the sediments of the middle Pechelbronn Beds of the Mainz Basin because of environmental reasons. *Turrilina alsatica* is widespread in the deposits of the Mainz Basin, and first appears at the base of the Bodenheim Formation and concomitantly at the base of the Alzey Formation. *Hansenisca soldanii* was mentioned in older publications but this species has subsequently been assigned to the genus *Gyroidina* following Kuhn (2000a). The biostratigraphic zonation is correlated with the nannoplankton zones of Martini & Müller (1971). A list of the foraminifera is included in the Appendix and the range of the important species in the biozones is illustrated in Figure 3.