



Reworked planktonic Foraminifera from the Late Rupelian of the southern Upper Rhine Graben and their palaeogeographic and biostratigraphic implications

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During the Late Rupelian the widespread second transgression (corresponding to international Ru2-3 transgressions; BERGER et al. 2005) affected the whole Upper Rhine Graben basin and led to the deposition of the several hundred meters thick marine “Série grise”. An abrupt transition (erosion surface) between the uppermost “Série grise” and Niederroedern Formation indicates the change to fluvatile and lacustrine conditions throughout the basin close to the Late Rupelian / Early Chattian boundary.

Abundant reworked Middle to Late Cretaceous (e.g., *Marginotruncana pseudolinneiana*) and Late Paleocene to Late Eocene (e.g., *Acarinina bullbrookii*, *Morozovella subbotinae*, *Turborotalia cocoaensis*) ranging planktonic Foraminifera occur in the “Série Grise” and equivalent lithological units of the Upper Rhine Graben and the Mainz Basin (e.g., FISCHER 1965, PIRKENSEER 2007, SCHÄFER & KUHN 2004). At least Late Cretaceous, Ypresian, Lutetian and Priabonian ages of source sediments are indicated by the overlapping biostratigraphic ranges of the reworked specimens. Abundant reworked material first appears in the lower “Couches à Mélettes” and reaches its acme in the increasingly “Marnes à Cyrènes” (terminal “Série grise”). Only sparse records are documented from the subsequent terrestrial Niederroedern Formation. These reworking events are linked to intervals of increased clastic input throughout the “Série grise”.

The planktonic Foraminifera are proposed to be reworked from related alpine deposits (later Helvetikum?) via a northwards trending fluvatile system, as no autochthonous Cretaceous and Early to Middle Eocene marine sediments were deposited within the graben basin. Furthermore other possible source areas (e.g., Paris Basin) were either not connected to the Upper Rhine Graben or were not subject to erosion in the Late Rupelian. This accords with the proposition (ROUSSE 2006) of a vast northwards prograding delta-system that was located close to the southern margin of the Upper Rhine Graben.

Reworked Mesozoic and Paleogene calcareous nannoplankton from the Upper Rhine Graben and the Mainz Basin confirms the data derived from planktonic Foraminifera.

The existence of reworked planktonic Foraminifera influences the biostratigraphic interpretation of the assemblage ranges attributed to “Série grise” samples. Facultatively reworked planktonic Foraminifera as *Subbotina utilisindex* and *Pseudohastigerina micra* ranging from the Lutetian to the Late Rupelian should not be included in the biostratigraphic analyses, as the occurrences of these facultatively reworked species are always linked to those of exclusively Cretaceous and Eocene age. Therefore the age of the “Série grise” deposits at Allschwil-2 is most likely to be placed within the “*Chiloguembelina cubensis* – *Globigerinella obesa* / *Globorotaloides variabilis*”-assemblage range of Mid P20 to Final P21a, lasting considerably longer than the very short Mid P20 range based on the presence of *Pseudohastigerina micra* as “last occurrence”-marker (PIRKENSEER 2007).

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