Stratigraphy of the Grund Fm., based on the Foraminifera

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New research above all in the Alpine – Carpathian foredeep brought results that correct our opinions of the border lower Miocene in view the global subdivision – Burdigalian s. l. and middle Miocene from the point of view of global analysis – Burdigalian s. l. and middle Miocene (Langhian and Karpatian and lower Badenian). According to the prevailing opinion, the sedimentation was interrupted between the Karpatian and the lower Badenian in Paratethys and basal clastics of Badenian were deposited approximately in one period, divided from underlying Karpatian.

Detailed analysis of foraminifera of Karpatian and lower Badenian proved the sequence developed in the Alpine Carpathian foredeep from the point of view of fauna and lithology corresponds with sequence from Karpatian to lower Badenian. Signs of shallowing in the sedimentation area have been proved in the dividing line of Karpatian and Badenian in many places. This is characterised by alternation of sands, clays and rare gravels. In the Alpine Carpathian foredeep, typical assotiation of the upper Karpatian are accompanied by numerous representatives of genus *Globorotalia* s. l., which appear in the underlying beds of the zone *Globigerinoides bisphericus*. It was only in the overlying beds of this zone where the first representatives of genus *Praeorbulina* were proved, that are accompanied by typical *Uvigerinas* of Karpatian in the oldest Badenian. This community of the oldest Badenian cannot be considered to be lower Lagenidae zone, particularly with *Lenticulina echinata*, *Planularia* div. sp. This development was studied in details in the region of Grund on sheets 1: 50 000 Hollabrunn and Hadres, e. g. between Wullersdorf and Buchberg – Mailberg. By mapping boreholes thicker basal clastics were not proved. They are known from the area of Novosedly, Brno etc., the sequence between typical Uvigerina Karpatian (Laaer Formation) and typical Lagenidae Badenian was classified as Grund Formation. The name Grund beds has been generally used since mid 19th century. In 1957, R. Weinhandl used the name Grund layers on sheet Hadres for the uppermost Helvetian (now Karpatian) and the oldest Tortonian (now lower Badenian).

Rögl et al (1998) in Cicha et al. (1998) compare from the point of view of stratigraphy the Grund Formation with lower Lagenidae zone of lower Badenian Roetzel et al (1999) – geological map Hollabrunn 1: 50 000 do not exclude the Grund Formation to belong to the upper Karpatian before the oncome of *Praeorbulina*. It is necessary to point out that Rögl et al. (1998) consider genus *Uvigerina macrocarinata* and e. g. *Vaginulina legumen* to be typical representatives of Lagenidae zone in this area. In another paper, Roetzel et al. (1999) consider typical locality Grund to be lower Badenian in age on the basis of appearance of small mammal *Megacricetodon*. In this area, Austrian and Italian geologists (Spezzafieri et al. – unpublished) later found 3 small specimens of the genus *Praeorbulina* in assotiation with microfauna of the Laaer Formation.

Stráník, Brzobohatý (2002) are considering the transgression of the Grund Formation to progress from southeast to north-east. The presence of these layers is quite probable in Ostrava region. In the Carpathian foredeep in Moravia, e. g. in the region of Hnanice, in boreholes HJ – 3 Žatèany, HJ –5 Žabèice, HJ – 2 Otmarov, HJ – 105 Dvorska, HJ – 4 Syrovice, HJ – 103 Opatovice, HJ – 101 Èernovice, in the surrounding of Brno, a group of layers can be found, which from faunistic and lithological point of view corresponds to Formation from Karpatian to lower Badenian. Similar development can be supposed in northern part of the foredeep in Austria, too.

The arrangement of layers of lower Badenian is still a problem. This is the case of clastics Formation of the region of Brno, gravels from Troskotovice, Novosedly, Drnholec and clastics in central part of Carpathian foredeep, e. g. in boreholes near Radslavice, Brodek u Pøerova, Vlkoš.

In the Alpine-Carpathian foredeep, younger foraminifera fauna of lower Badenian can be found – *Lenticulina echinata*, *Planularia auris*, *Planularia antillea ostraviensis*, *Planularia dentata*, *Palmula jonesi*, *Lingulina costata* etc. The above mentioned fauna is plentiful in so called „Tegel" in the surrounding of Brno, the Neogene of the Boskovice furrow (southern part), Boraè, central Moravia etc. These communities are from youger beds as the Grund Formation. The relationship of these Planularia etc. developments to Neogene of Appenine penninsula, it is to Langhian and Serravallian. In the Appenine penninsula between type locality of Langhian and Serravallian (Rögl – private information), there exists Hiatus in the period of 1 mio years and border stratotype between Langhian and Serravallian has not been determined yet.