Ber. Inst. Erdwiss. K.-F.-Univ. Graz	ISSN 1608-8166	Band 14	Graz 2009
Paleozoic Seas Symposium	Graz, 14-18th September 2009		

Eifelian and Givetian reef pioneer communities: examples from the Graz Paleozoic

HUBMANN, B.[1] & SUTTNER, T.J.[2]

(1) University of Graz, Institute of Earth Sciences (Geology and Palaeontology), Heinrichstrasse 26, A-8010 Graz, Austria; *bernhard.hubmann@uni-graz.at*
(2) Austrian Academy of Sciences (CPSA) c/o University of Graz, Institute of Earth Sciences (Geology and Palaeontology), Heinrichstrasse 26, A-8010 Graz, Austria; *thomas.suttner@uni-graz.at*

The sequence of the upper nappe (Silurian-Carboniferous) of the Graz Thrust Complex reflects the geodynamic history from continental breakup during the Silurian, shelf and platform configuration during the Devonian and open marine settings near the Devonian-Carboniferous boundary. The sequence ends with a near-shore development during the lower Pennsylvanian.
During the Devonian period the depositional area reached after a progressive northward drifting subtropical to tropical latitudes (FENNINGER *et al*. 1997).
Persistent subsidence during the Devonian time span - although interrupted by sea-level diminutions - is documented by progressive carbonate production and reef-developments (HUBMANN *et al*. 2006). Sea level rises after remarkable lowstands in the Euramerican realm (JOHNSON *et al*. 1985) at the Emsian/Eifelian boundary and lower Givetian are connected with the immigration of certain carbonate precipitating organisms that initiated pavements for further settlement of encrusters preparing initial stages of reef growth.
In the Graz Paleozoic Middle Devonian biostromal and biohermal structures are developed within sequences of the Plabutsch Formation (Eifelian) and the Kollerkogel Formation (Givetian).
The Plabutsch Formation (approx. 100 m thick) represents a highly fossiliferous sequence whose stratigraphic boundaries are still unknown. Although the macrofauna point to Eifelian age, the sequence locally may range from the Upper Emsian to the Lower Givetian. Deposition in restricted to open gently inclined platform environments is assumed (HUBMANN 1993). The majority of the fossils found in this formation belongs to stromatoporoids, favositids, various rugose corals. Representatives of the tabulate coral *Thamnopora* predominate and suggest a great importance for current reduction and 'baffling' of fine-grained sediment.
At the base of the formation brownish marly, thin-bedded limestones are developed in some localities which represent the "Gaisberg Bed" (FLÜGEL 2000). The Gaisberg Bed reaches approximately 8 to 10 meters in thickness and is known for its chonetid brachiopod fauna. Densely packed chonetids ("*Chonetes subquadrata*", "*C. sarcinulata*", "*C. oblonga*") often occur together with ostracods (Eridostraca). Thin-walled auloporid tabulates (*Aulostegites*?) of very small individual sizes used the shells which are mostly in convex orientation as hard-ground thus autochthonous carbonate production increased. In the uppermost part of the Gaisberg Bed favositid corals (*Favosites styriacus*) started to settle, therewith encouraging progressive carbonate sedimentation and providing facilities for other corals to colonize. The transition of orange to brownish marls and limestones that contain the obove mentioned chonetid-auloporid comminities to greyish blue limestone beds with tabulate and rugose corals highlights the change from pioneer stage to colonization/stabilisation stage in the sense of WALKER & ALBERSTEDT (1975).
Usually the Plabutsch Formation is overlain by dolostones varying in thickness (up to 100 m) which pass into a sequence of massive limestones. At the Weiße Wand (some 20 km north of Graz) a thin horizon of cellular dolomite marks the beginning of the Givetian Kollerkogel Formation. At the base of the formation limestones of some 10 m in thickness containing a 'reef pioneer settlement', dominated by densely packed *Stachyodes* and auloporids in a black bituminous limestone matrix is developed. This sequence passes into dark-grey fossil-

rich limestones with special rugose coral consortia dominated by *Mesophyllum* and *Stringophyllum*. A thin horizon (approximately 30-50 cm) with small colonies of the phaceloid rugosan *Thamnophyllum* terminates the 'pioneer sequence', which is overlain by 20-30 m-thick, white and slightly dolomitized limestones. The latter contain accumulations of various reef-building organisms (stromatoporoids, rugose and tabulate corals).

References

FENNINGER, A., HUBMANN, B., MOSER, B. & SCHOLGER, R. (1997): Diskussion zur paläogeographischen Position des Grazer Terrane aufgrund neuer paläomagnetischer Daten aus dem Unterdevon. – Mitteilungen des Naturwissenschaftlichen Vereines für Steiermark, 126: 33-43.

FLÜGEL, H.W. (2000): Die lithostratigraphische Gliederung des Paläozoikums von Graz (Österreich). – *In*: FLÜGEL, H.W. & HUBMANN, B. (eds): Das Paläozoikum von Graz: Stratigraphie und Bibliographie. – Österreichische Akademie der Wissenschaften, Schriftenreihe der Erdwissenschaftlichen Kommissionen, 13: 7-59.

HUBMANN, B. (1993): Ablagerungsraum, Mikrofazies und Paläoökologie der Barrandeikalk-Formation (Eifelium) des Grazer Paläozoikums. – Jahrbuch der Geologischen Bundesanstalt, 136: 393-461.

HUBMANN, B., SUTTNER, T.J. & MESSNER, F. (2006): Geologic frame of Palaeozoic reefs in Austria with special emphasis on Devonian reef-architecture of the Graz Palaeozoic. – Joannea – Geologie und Paläontologie, 8: 47-72.

JOHNSON, J.G., KLAPPER, G. & SANDBERG, C.A. (1985): Devonian eustatic fluctuations in Euramerica. – Bulletin of the Geological Society of America, 96: 567-587.

WALKER, K.R. & ALBERSTEDT, L.P. (1975): Ecological succession as an aspect of structure in fossil communities. – Paleobiology, 1: 238-257.