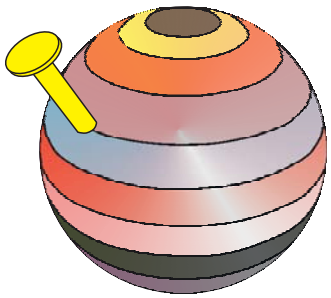
Berichte des Institutes für Erdwissenschaften
Karl-Franzens-Universität Graz, Band 21



2nd International Congress on Stratigraphy

STRATI 2015

19. - 23. July 2015, Graz, Austria

Abstracts

Organizing Committee

Executive members

Werner E. Piller, Syvain Richoz, Georg Stegmüller, Gerald Auer, Angela Garcia-Gallardo

University of Graz

Gerald Auer, Gertraud Bauer, Angela Garcia-Gallardo, Elisabeth Gülli, Bernhard Hubmann, Walter Kurz, Werner E. Piller, Claudia Puschenjak, Sylvain Richoz, Georg Stegmüller

Universalmuseum Joanneum, Graz

Bernd Moser, Ingomar Fritz, Martin Gross

Geological Survey of Austria, Vienna

Ralf Schuster, Jürgen M. Reitner

University of Vienna

Michael Wagreich

University of Natural Resources and Life Sciences, Vienna

Markus Fiebig

Editorial: Elisabeth Gülli, Werner E. Piller
Institute of Earth Sciences, Department of Geology and Palaeontology,
University of Graz, Heinrichstrasse 26, 8010 Graz, Austria

ISSN 1608-8166

Ber. Inst. Erdwiss. K.-F.-Univ. Graz	ISSN 1608-8166	Band 21	Graz 2015
STRATI 2015	Graz, 19 – 23 July 2015		

Can facies act as a chronostratigraphical tool?

FERRETTI, Annalisa[1], CAVALAZZI, Barbara[2], McLAUGHLIN, Patrick I.[3], BARBIERI, Roberto[2], EMSBO, Poul[4], FOUCHER, Frédéric[5], MALFERRARI, Daniele[1], MESSORI, Fabio[1], WESTALL, Frances[5]

[1] Dipartimento di Scienze Chimiche e Geologiche, via Campi 103, 41125 Modena, Italy, email: ferretti@unimore.it
[2] Dipartimento di Scienze Biologiche, Geologiche e Ambientali, Università di Bologna, Via Zamboni 67, 40126 Bologna, Italy
[3] Wisconsin Geological and Natural History Survey, Madison, WI 53705, USA
[4] US Geological Survey, Denver, Colorado, USA
[5] Centre de Biophysique Moléculaire, CNRS-Orléans, Rue Charles Sadron, 45071 Orléans cedex 2, France

Recent advances in chronostratigraphy are enabling global correlation of Silurian strata at a temporal resolution of 10-100 k.y. Comparative analysis of disparate localities at this resolution is yielding surprisingly similar peculiarities of facies. Facies analysis has been traditionally regarded as a tool to investigate local paleoenvironmental conditions and reconstruct past paleoecological settings. Less frequently are aspects of facies recognized as long-distance time-correlative markers. The concept of time-specific facies, originally proposed by Walliser (1986) and recently revised by Brett et al. (2012), challenges the "strictly local" facies paradigm by emphasizing that some aspects of facies are signatures of broader oceanic-climatic processes. Their synchronous occurrence, spanning major portions of sedimentary basins to globally, represents the key distinctive factor of time-specific facies. This aspect is combined with the significance of the ecostratigraphic analysis as a tool to identify bioevents and, therefore, for improving biostratigraphic subdivisions (e.g., Boucot, 1986).
Marine ironstones represent a prime example of time-specific facies. Silurian ironstones retaining microbial signatures are documented by Ferretti et al. (2012) in forms of Fe-rich oolitic horizons and ferruginous laminated structures for the Llandovery-Wenlock boundary interval (mid-late Telychian, *Pt. celloni* Superzone-*Pt. a. amorphognathoides* Zone and Sheinwoodian, *Oz. s. rhenana* Zone) in the Carnic Alps (Austria). Age-equivalent ironstones also occur in the Appalachian Basin of eastern North America (McLaughlin et al., 2012). Appalachian Basin ironstones collected from the New Point Stone quarry (Napoleon, Indiana) and Dawes Quarry Creek (Clinton, New York) were recently analyzed through combined analytical techniques (i.e., confocal laser Raman microscopy, X-ray diffraction, ESEM-EDX, and optical microscopy) for a geobiological characterization. Results demonstrate that the Appalachian ironstones seem to reflect the same microbially-mediated iron mineralization already documented in the Carnic Alps. Combined evidence of iron geochemistry and microbial interactions include i) the formation of planar laminated ironstones (late Telychian); ii) coeval ooidal pack- to grain-ironstones; iii) a wealth of other microbial-related morphostructures and mineralogies. The synchroneity of iron microbe activity on opposite ends of the Iapetus Ocean during the late Telychian and Sheinwoodian is inferred as a time-specific sea water redox signature associated with the Ireviken Event.