Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11318, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11318
EGU General Assembly 2008

Petrographical perspective on microbial structures' response to energy of environment – in the search for general model

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Microbial structures such as: biofilms, mats and carpets are very sensitive indicators of physical and/or chemical conditions during depositional process. They can be found within different types of sedimentary rocks, deposited in almost every known type of depositional setting. Regardless the systematic composition of these structures, they can be used in paleoreconstructions as very good proxies of energy of environment. To date, only few models, presenting characteristic microstructures and their genesis' interpretations were introduced. All of them were based on datasets from specific environments, therefore restricted to some extent.

The main goal of this work is to compile: existing models, introduced microbial microstructures and their environmental interpretations into one consistent framework, which can be used in future research. A continuum: "deposition from suspension => traction" (= increasing level of energy of depositional environment), as proposed by Ochmański (2007), and expanded by Ochmański & Bieńkowska (this session) is used to sort data presented. Other detailed models and/or interpretations (e.g.: Gerdes et al. 2000; Flügel, 2004; Schieber, 2004; Sarkar et al., 2004) are discussed and assigned to appropriate categories in the scheme presented. Images of particular microbial structures are compared with respect to lithology (the fine grained sediments vs. coarser clastics vs. carbonates) and age (the Cambrian to recent) of the host rock. Finally brief summary on advantages and limitations of petrographical methods for future research is given.