Geophysical Research Abstracts,
Vol. 10, EGU2008-A-06317, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-06317
EGU General Assembly 2008

Rhodalgal lithofacies of the Porto Badisco Calcarenite (upper Chattian, Salento, Apulia, southern Italy)

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There are few detailed studies documenting the evolution of shallow-water carbonate facies from the Oligocene to Miocene. This is anomalous considering that this was the time of the transition from the warm late Oligocene to the Neogene “Icehouse” (with major changes in climate, ice volume and ocean circulation) and of a major shift in the composition of the carbonate factory of shallow tropical and subtropical seas. The upper Oligocene of the Apulia Carbonate Platform in the Salento Peninsula (Apulia, Southern Italy) is represented by the Castro Limestone, an early Chattian coral reef complex, and by the Porto Badisco Calcarenite, documenting the development of a rhodalgal dominated carbonate factory during the late Chattian. These two units are separated by a discontinuity surface.

We have studied in detail a 26 m-thick section of Porto Badisco Calcarenite. Relative abundance of biotic components, defined by point counting in thin section, was analyzed by hierarchical cluster analysis in order to discriminate lithofacies. The

main constituents of the Porto Badisco Calcarenite are corallinacean red algae and larger foraminifers. Rhodoliths occur at the base of the logged section, where they form a m-thick channel-fill, and in the upper part. Red algal assemblages are dominated by melobesioids with subordinate mastophoroids and sporolithaceans. Larger foraminiferal assemblages are dominated by rotalids. Robust tests of *Nephrolepidina*, *Miogypsinoides* and biconvex *Amphistegina* occur together with more flat and delicate *Eulepidina*, *Operculina* and *Heterostegina*. *Neorotalia calcar* is abundant among the smaller rotalids. Encrusting foraminifers are common, while porcellaneous foraminifers are fairly rare and represented almost exclusively by *Austrotrillina*.

We use shape, size, structure and taxonomic composition of rhodoliths to infer water-depth and energy, with additional constraints given by the composition of larger foraminiferal assemblages and by test-shape analysis of *Amphistegina*.

Finally we use our case history of the Porto Badisco Calcarenite to discuss the paleoclimatic and paleoceanographic controls on the development of the rhodalgal carbonate factory.