

maps were constructed from available samples and micropaleontological analysis involving planktonic foraminiferal zonation were used to place depositional environments in time and space. Results of this study indicate that Albian to middle Cenomanian (108-101 my) samples were sparsely fossiliferous and yielded dwarf species such as *Guembelitra cenomana*, *Hedbergella gorbachikae* and *Heterohelix moremani*. This interval contains low TOC (<0.5 wt%), poor HI (<150 mg HC/gTOC), high values of Tmax (>465 °C) and kerogen of type III organic matter. The late Cenomanian to early Turonian (100-95 my) samples were characterized by *Rotalipora greenhornensis*, *Rotalipora cushmani*, *Whiteinella archeocretacea*, and *Praeglobotruncana stephani*. Within this interval, there is a sharp enrichment in TOC (3 to 12 wt%) with HI fluctuating between 200 and 450 mg HC/gTOC, an average Tmax value of 435 °C and the kerogen is of type I/II indicating exclusively marine condition. *Whiteinella baltica*, *Margino truncana sigali* and *Heterohelix globulosa* characterized the middle Turonian to Coniacian (92-86 my) samples. This interval contains moderate TOC (0.5 to 1.5 wt%) with HI less than 250 mg HC/gTOC, an average Tmax value of 427 °C and kerogen is of type II/III indicating marine and continental input. From these observations, it can be deduced that, there is variation of middle Cretaceous organic matter accumulation in time and space with three depositional cycles delineated. The late Cenomanian to early Turonian organic facies have the highest source-rock potential.

#### Sedimentological and geochemical evaluation of Lafia-Obi coal, Benue trough, Nigeria

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Seventy-five samples of Lafia-Obi coal, from four boreholes were investigated in the present study to ascertain their sedimentological and geochemical characteristics. These will enable proper evaluation of their source rock potential and industrial utilization. Lafia-Obi area is underlain by rhythmic sequences of shale, sandstone and limestone with varying thicknesses of interbedded coal inferring deposition under shallow marine conditions. The ash and moisture contents of the coal are high suggesting good potential for steam raising. The relatively low volatiles and high vitrinite/inertinite content, show that the coal has appreciable coking property. Although, the total organic carbon content exceeded the kerogen threshold of 0.5 wt% for generation of crude oil, the high vitrinite reflectance values (R<sub>0</sub> >1.0 %) and several chemical maturity indices indicate mature to „overcooked“ facies. This paper compares and contrasts the geological and geochemical characteristics of the Lafia-Obi coal with those of Enugu coals and with emphasis on the possible economic applications of the former.

#### Development of the margin of a Middle Triassic atoll-like buildup: the Latemar, Dolomites, Italy

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Most of the studies dealing with the Latemar platform concentrated

on the lagoonal interior and the reef (e.g. GOLDBAMMER & HARRIS 1989, SEPM Spec Publ 44; EGENHOFF et al. 1999, Sedimentology 46). Recent investigations of slope successions proved the local development of an escarpment at Corno D'Ega, triggering the collapse of the upper slope after an initial buildup phase. Spectacular breccias crop out, partly in direct contact with lagoonal sediments. Some of the breccia units show rollover structures with inclinations towards the lagoon, probably owing to subsidence along listric fault planes. At the eastern margin of the atoll, at Cresta De Do Peniola, a clear change in the character of the slope was observed, developing from depositional to erosional. Both outcrops are approximately of the same age, they are correlated with the late Tepee Facies to early Upper Cyclic Facies sensu GOLDBAMMER & HARRIS (1989). A possible explanation for these changes might be increased aggradation due to a change of the accommodation rate (from keep-up/progradation to catch-up), causing local oversteepening of the platform and subsequent collapse.

If the passage from the lagoonal interior to the basin is not disturbed, the horizontal sediments of the lagoon pass into upper slope sediments within a few tens of metres. The reef rim, consisting of bound- and bafflestones, is usually extremely small. In a transect at the western platform margin nearby Malga La Mens, talus-breccias of the upper slope follow, passing into lithoclastic grain-to rudstones and microbreccias of the middle slope. Most of the components are derived from the reef rim. In contrast to eastern outcrops (Cresta De Do Peniola), clear indications of biogenic carbonate production were not found. However, growth of cements contributed strongly to the sediment thickness at the Malga La Mens section. Reasons for this difference are not quite clear. Possible explanations could be differences in the distance to the reef, the slope angle, the wind direction and/or currents. Further downslope, stacked turbidites consisting of lithoclastic wacke- to grainstones/rudstones as well as megabreccias/megaconglomerates were found, often encasing sliding megablocks. The facies of the basin margin consists of not seldomly laminated radiolarian wackestones with intercalated carbonate turbidites (lithoclastic pack- to rudstones).

The areal distribution of these facies on the western margin, which are correlatable with the lower 400 m of the about 650 m thick lagoonal succession, outline an obviously complicated paleotopography/paleogeography. Clinofolds clearly indicate the presence of an inlet, bordered by marginal highs in the NW and SW of the atoll. Basin margin facies overlaps the preceding Contrin ramp, early stages of the Latemar carbonates show downlap geometries towards this ramp. In contrast to assumptions of a constantly aggrading atoll (GOLDBAMMER & HARRIS 1989), early stages show progradational features followed by later aggradation. This can lead to the a.m. collapse of the margin because of oversteepening and to its subsequent, local retreat. Backstepping of the entire inner platform was not observed.

#### Sedimentology and palaeoenvironmental interpretation of the Carboniferous Poggio al Carpino Formation [PaCF] of the Monticiano-Roccastrada Zone [MRZ] (Southern Tuscany, Italy)

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**Introduction:** The PaCF, first defined by COCOZZA et al. (1978), is element of the Mid Tuscan Ridge - a linear belt of several discretely outcropping metamorphic core complexes, where the S-Tuscan Low Grade Metamorphic Basement is exposed (JOLIVET et al. 1998); it is made up of palaeozoic epicontinental marine sediments, unconformably covered by the ?M-Triassic terrestrial Verrucano.