The sample locality within the Rhaetian Kössen Formation implies an organic maturity in terms of vitrinite reflectance between 0.9 to 1.0 % Ro. Maximum temperatures of organic matter maturation characteristic for the middle of the oil window are further corroborated by the methylphenanthrene index (MPI 1; RADKE et al. 1982).

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## Sequence stratigraphy of Zechstein Cycle-1 carbonates and evaporites in the Hessian Basin, Germany

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A sequence stratigraphic model for the Hessian Basin (Germany) including the rocksalt bearing Werra Subbasin is based on detailed lithofacies and facies descriptions of Zechstein Cycle-1 carbonates and evaporites in the cores of more than thirty wells. The Hessian Basin is located at the southern margin of the Southern Permian Zechstein Basin. Two complete third order depositional sequences are recognized within the succession.

Zechstein sequence 1 (ZS1)

Reworked sandstones of the Weissliegend and/or the Zechstein-Conglomerate overly Zechstein-sequence-boundary-1 and are interpreted as transgressive systems tract deposits of ZS1 (STROHMENGER et al. 1996). Laminated shales of the Copper Shale are regarded as a condensed section. The overlying Zechstein Cycle-1 carbonates (Zechstein-Limestone) represent predominantly highstand systems tract deposits. The carbonates show a great variety of depositional environments ranging from high-energy beaches and oolite shoals at the western margin to algal reef mounds and associated back-reef facies in the southern parts. In the centre of the Hessian Basin (i.e. in the Werra Subbasin) low energy shallow water carbonates (mudstones, oncoid and pisoid wackestones) dominate. Within the carbonates two shallowing upward cycles (fourth order) are developed nearly throughout the whole Hessian Basin. They are interpreted as parasequences.

Zechstein sequence 2 (ZS2)

At the southern and western margins of the basin a type-1 sequence boundary is developed. In the more central parts of the Hessian Basin Zechstein-sequence-boundary-2 is characterized by a facies shift to peritidal deposits. In the Werra Subbasin this peritidal facies (Werra-Anhydrite) consists of subtidal laminated carbonates with displacive gypsum crystals. To its west intertidal cryptalgal laminites and supratidal sabkha (chicken-wire) anhydrites occur. The peritidal facies association formed under relative lowstand conditions. It represents an aggradation of peritidal wedges and is regarded as a shelf margin systems tract. Two shallowing upward cycles (fourth order) are recognized and interpreted as parasequences. During the subsequent transgressive systems tract a salina and sabkha facies association is developed. In the Werra Subbasin only a thickness of 10 m is found whereas to the west a thickness increase (> 50 m) indicates more favourable physico-chemical conditions for sulfate precipitation. Within subaqueously formed salina-type (selenite) anhydrites thin intercalations of supratidal sabkha-type (chicken-wire) anhydrites occur. Each succession from salina to sabkha sediments represents a shallowing upward cycle. Three of those cycles are recognized and interpreted as parasequences. Furthermore, in the Werra Subbasin laminated, bituminous sulfates and carbonates occur. The laminites were deposited in slightly deeper water and mark the maximum flooding in the area. During the following highstand systems tract a simultaneous deposition of sulfates and chlorides (Werra-Halite) took place. Thick wedges of shallow water sulfates developed around the Werra Subbasin. Rocksalt deposition (up to 300 m) was restricted more or less to the Werra Subbasin.

In the Hessian Basin sulfate precipitation started under shallow water conditions and evolved into deeper water, whereas rocksalt deposition took place in a deep water environment. The deep water/deep basin setting of halite precipitation in the Werra Subbasin was caused by continuing subsidence/sea level rise and differential evaporite precipitation.

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## Contribution to the geology-sedimentology of the Breccia Member, Topolia Formation, NW Crete, Greece

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Crete island is considered part of the Hellenic Arc System, the latter developing to the north of the active subduction, where the African plate underthrusts Eurasia. The Neogene Topolia Formation, is mainly consisted of various limestone breccia, their genesis being long controversially discussed. It is subdivided into the component poor "Lissos-Schichten" (SW Crete) and the rich in components "Topolia-Breccie" (NW Crete) respectively (KOPP & RICHTER 1983). According to the International Stratigraphical Guide (SALVADOR 1994), we introduce here the term Member for these two subdivisions of the previous authors. Our study concerns the strongly cemented Breccia Member (former "Topolia-Breccie"), being well-developed along the southern and eastern margin of the Late Miocene Kastelli-Kissamou Basin. Two opinions are mainly concerning on the formation of this Member; a) transported together with the Tripolitza and Pindos nappes and placed on its present location (KOPP & RICHTER 1983) or b) deposited under brittle tectonical control in situ *s.l.* (co. POSTMA et al. 1993, JOLIVET et al. 1996, BELLAS & KEUPP 1999). After detailed mapping (scale 1:10.000), we support the second thesis, firstly, because there had to incorporate at least equal components from the Pindos nappe, while it is almost consisted of Tripolitza derived limestone breccia and secondly, it should be diversified at various geographical and geologically stratigraphical positions, following shear-weakness zones of the Pindos nappe, a fact not recognisable from the distribution on previous and our geological/facies map (BELLAS & KEUPP in prep.).

Normal Optical and SEM techniques used for the study of the Breccia Member, revealed seven different types of carbonate components according to which they are classified below (after DUNHAM's scheme): 1) Grainstone with Oncoids and very rare Miliolidae, 2) Wackestone, rich in benthic foraminifera, 3) Mudstone with rare benthic foraminifera (possibly of protected lagoonal, origin), 4) microbial Bindstone, 5) pure Dolomite components