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Mineralogy of siliceous concretions, cretaceous of Ionian zone, western Greece: Implication for diagenesis and porosity**Avraam Zelilidis¹, Nicolina Bourli¹, Maria Kokkaliari¹, Ioannis Iliopoulos¹, Georgia Pe-Piper², David Piper³, Angelos Maravelis¹**¹ University of Patras, Greece² Mary's University, Greece³ Bedford Institute of Oceanography, Canada

XRPD analysis, in selected samples, in both nodules and siliceous beds, showed the presence of moganite and Opal-A minerals and introduce mostly an amorphous silica. The presence of maghemite may be evidence for the importance of redox-controlled pore-water boundaries in the initial precipitation of amorphous silica, as maghemite can form by dehydration and transformation of certain iron oxyhydroxide minerals.

Results showed different calcite content or the presence/absence of halite and anhydrite, from different age and different areas, from both nodules and siliceous beds, suggesting great differences between areas, due to different sources, and introduce different tectonic activity between areas with more intense tectonic activity in NW Peloponnesus than in Kastos Island.

The content of calcite in cherts is likely a consequence of the amount of early amorphous silica precipitation. The siliceous beds in Gianiskari have a higher calcite content than nodules of Araxos, both in NW Peloponnesus, suggesting increased replacement mostly in nodules, whereas in both areas, there is no difference in calcite content between upper Cretaceous siliceous bed and nodules. The calcite content of upper Cretaceous chert is higher in Kastos Island than in NW Peloponnesus. The major source for Kastos Island was the Apulian platform whereas for NW Peloponnesus was the Gavrovo platform, so the physical properties of the two sediment successions might differ, thus affecting diagenesis. The clearest evidence for the role of later fluids is the presence of halite and anhydrite only in NW Peloponnesus, where there are fault pathways for basinal fluids from underlying Triassic evaporites that include halite and gypsum. The erosion of Triassic evaporites, only in the eastern part of the basin, could be related with intense tectonic activity in this part of the basin. This difference is because it was influenced by the

first stages of compression (late Eocene to early Oligocene), situated between Gavrovo and internal Ionian thrusts, that the western parts of the basin, which influenced by later stages (late Oligocene-early Miocene), situated between middle Ionian and Ionian thrusts.

The characteristic presence of dolomite in lower Cretaceous siliceous bed is in accordance with the presence of dolomitized limestones at the lower parts of early Cretaceous Vigla formation. Either the dolomite replaced calcite before final growth of the siliceous bed horizons, or chert was replaced by dolomite. The size and the abundance of nodules was related with mostly with primary porosity of the hosted deposits and in relation with the fact that Early Cretaceous nodules are smaller and in abundance that these of Late Cretaceous support the idea that the porosity of Late Cretaceous hosted limestones is greater than in Early Cretaceous hosted limestones. The fact that now both present equivalent porosities support the idea that the development of nodules increased secondarily the porosity of Early Cretaceous limestones.

Speaker Biography

Avraam Zelilidis was graduate Geologist in 1984 and a PhD in 1988 in the Department of Geology of the University of Patras. He was appointed as a lecturer in 1993 and since 2009 as a full professor in the Department of Geology of the University of Patras. He served as Dean of the Faculty of Natural Sciences at the University of Patras from 2006 to 2010. Research deals with the Analysis of Sedimentary Basins, Sequence Stratigraphy, Seismic Stratigraphy and Petroleum Geology. Have produced many research projects for oil companies using data in both surface and subsurface, while he organized many field seminars for foreign oil companies. He has published more than 100 papers in international journals, most of which refer to the hydrocarbon potential in Greece and have been presented in international conferences in an effort to highlight the issue of existence-exploitation of hydrocarbon fields in Greece.

e: zelidlisavvaram@patras.gr