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Sedimentary facies analysis and biostratigraphical implications of the marine sediments of Central-West Crete (Selli Section-Rethymnon)

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The Selli Section is located in the central-west Crete and especially in Apostoli Basin. The tectonic-sedimentary regime of Apostoli Basin corresponds to a tectonic graben filled by sediments originated from the tectonic rise of the Preneogene basement.

Four facies associations have been recognized:

i) alluvial fan conglomerate deposits, ranging from debris flows to shallow braided gravels and sands, ii) transitional brackish deposits, iii) open marine, shelf deposits, iv) carbonate platform.

The vertical distribution of the sedimentary facies indicates a marine transgression which was rhythmic resulting in rhythmic sedimentation.

The existence of rhythmic sedimentation has been noted in the continental and coastal deposits. The interpretation of these rhythmic sedimentary deposits depends on the climatic conditions which control the sediment supply.

The combination of two depositional models describes the prevailing conditions of sedimentation. The first one is the clastic model which comprises the continental and the coastal deposits. The second one, the non-clastic model, is younger than the clastic one, it gradually covers it and it comprises the shelf deposits.

The regional tectonic subsidence, the ongoing tectonic activity of the broader area, the gradual diminishing of sediment supply and the prevailing climatic conditions are considered the responsible factors that gave shape to the studied sedimentary sequence.

Finally, in order to determine biostratigraphically the marine sediments of the studied section, a quantitative analysis of the calcareous nannofossils has been carried out. This analysis led to the conclusion that the marine sediments of Selli Section biostratigraphically correspond to CN7a-b (BUKRY, 1973,1975) and NN9 (MARTINI, 1971) biozones which chronostratigraphically points to an Early Tortonian age.

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