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Paleoceanographic trends in the Campanian–Maastrichtian Pelagic Succession, Mudurnu-Goynuk Basin, NW Turkey

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A continuous Late Campanian – Danian hemi-pelagic succession (the İsmailler section – Mudurnu-Goynuk basin) from northern branch of the Neotethys is investigated with stable isotopes and elemental data to investigate the paleoceanographic and paleoclimatic conditions of the basin. The effects of the basinal tectonics on paleoceanographic trends were also discussed. Furthermore, the section is correlated with Boreal, south Atlantic and tropical Pacific successions based on δ13C events.

The Late Cretaceous time period is very important for the evolution of the study area. The closure of the northern branch of the NeoTethys started in this time period although for many authors the precise age is still under debate. Also, it is very important to understand the tectonic evolution of the basin during the Late Campanian-Danian, to distinguish the records of the global oceanographic events from local ones. The provenance studies of mudstones showed that the characteristics of the source rocks changed from felsic to mafic at the Late Campanian and stayed stable through the Maastrichtian. The increase in mafic source rocks is attributed to uplifted oceanic crust slices, i.e. initiation of the closure placed in the Late Campanian.

Throughout the Campanian and Maastrichtian four carbon isotope events are distinguished; 1) a rapid $\sim$1‰ decrease in δ13C values in Globotruncanella havanensis Zone, 2) a $\sim$0.5-1.0‰ excursion to lower δ13C values at the beginning of Gansserina gansseri Zone, 3) an interval of rapid consecutive shift to higher and lower values with an amplitude of $\sim$1‰ in δ13C values in Racemiguembelina fructicosa Zone and 4) a long term gradual decreasing trend of more than 1‰ in δ13C values in Abathomphalus mayaroensis Zone.

The first carbon isotope event coincides with the major provenance change. Therefore, this event is attributed to a tectonic reorganization of the basin. The second event occurs close to the Campanian–Maastrichtian Boundary. This negative δ13C excursion can be easily correlated with other Boreal, Atlantic and Pacific successions. The third event is the positive δ13C shift which is considered as the Early/Late Maastrichtian boundary event caused by reorganization or circulation patterns in world oceans. The last event covers longer time period than previous ones and characterized with a gradual decrease in δ13C.

In summary, the Ismailler section makes a valuable contribution to our understanding of carbon cycle dynamics and thus to paleoceanographical reconstructions of the Late Cretaceous Oceans. From the Late Campanian upwards, sediment influx into the basin was stabilized. Therefore carbon isotope patterns can be used for relatively detailed stratigraphic correlation with several important late Cretaceous sequences worldwide.