



The Formation of a Sublacustrine River Valley in the Bulgarian Shelf Zone of the Black Sea

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During the Last Glacial Maximum (LGM) about 20 000 years ago the shelf zone of the Black Sea was not covered with water ; the sea level was about - 120 m. At the LGM the Black Sea was a closed system with inflow of water and sediments from the north-western and the northern drainage area of the European rivers (Danube, Dnjepr, Dnjestr and Don). The Danube (contributing ~ 65% of the entire water inflow to the Black Sea) has its mouth on the continental slope and formed canyons to the basin, the so - called Danube fan. The general increase of the sea level during the last 20 000 years is dominated by the melting of the ice shield in the northern hemisphere and the glaciers of the European mountains. The slow sea level rise changed about 17 kyr ago. In addition to the increasing inflow from the NW and N drainage area, water and sediments began to flow into the Black Sea from the Caspian Sea over the Manych-depression and the Strait of Kerch , reaching a sea level maximum of - 23 m in the following 2,5 kyr , i.e., about 14,3 kyr ago, as indicated by biolithitic rocks of serpulides and algae on an old beach ridge (Preisinger & Aslanian, 2003). The method we used were measurements by means of Sedigraph SES 96, satellite photographs, Scuba- RADAR (500 MHz antenna) as well as sediment analyses of drilling cores in biolithitic rocks, which exist in pyramidal form along the Bulgarian coast. Age determinations were performed by $^{14}\text{C}_{org}$ Accelerator Mass Spectrometry (AMS) at the VERA Laboratory of the Vienna University. The deposition of sediments during these 2,5 kyrs was dominated by a “Rim Current” (Oguz and Besiktepe, 1999), which runs anticyclonic from the Strait of Kerch to the NW-slope, along the Bulgarian to the Turkish coast. The increase of the sediment deposition from the Caspian Sea was determined by the sedimentation rate from the gravity cores of the Black Sea which is higher in direction to the shelf zone. After 14,3 kyr BP the sea level decreased again

leaving an elevation parallel to the Bulgarian coast. Since this time the rivers entering the Bulgarian part of the Black Sea could not traverse the continental slope, and flowed between the elevation and the Bulgarian coast, forming a sublacustrine river valley during the following cold period of the Younger Dryas. The water and sediments of rivers entering the Black Sea like the Danube were not only transported directly to the basin, but some of the water and sediment flowed along the Bulgarian coast to the south, depositing the transported sediments in this sublacustrine river valley during the Holocene. Since the entrance of water and sediment from the Marmara Sea about 9,5 kyr ago the sublacustrine river valley got filled rhythmically with sediments from the Danube.

References

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