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Origin of the Western Marmara Ridge in the Sea of Marmara

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Tekirdağ, Central and Çınarcık Depressions and intervening Western and Central Marmara ridges characterize the bathymetry of the Sea of Marmara Basin. The Western Marmara Ridge (WMR) is a 33 km long, 23 km wide and 440 m high submarine topographic feature with a NE-SW orientation. It is made up of Upper Oligocene to Holocene sediments. It is located between the Tekirdağ and the Central Depressions and displays a complex structural geology dominated by NW-SE-striking normal faults, NE-SW-striking reverse faults and folds and ENE-WSW to E-W-striking strike-slip faults. These structures are resulted mainly from the development of the dextral North Anatolian Shear Zone in the Marmara Region during medial Miocene to present time. Their detailed analysis and comparison with the tectonic structures in the Thrace Basin show that they represent various structure stages of the shear evolution, such as pre-peak, peak, post-peak and pre-residual. Dip-slip faults and the folds formed during the pre-peak structure stage, whereas the strike-slip faults originated as Riedel and P shears in the peak, post-peak and pre-residual structure stages. The structural configuration of the WMR during the latter stage may represent the initial state of the development of a master fault in the Sea of Marmara.