



Paleoseismicity and Morphotectonic aspects of the Yedisu Seismic Gap of the North Anatolian Fault Zone (Turkey)

C. Zabcı (1), H. S. Akyuz (1), T. Sancar (2), V. Karabacak (3), E. Altunel (3), and C. C. Yalciner (3)

(1) Istanbul Teknik Universitesi, Ayazaga Kampusu, Jeoloji Muh. Bolumu, 34469 Istanbul, Turkey, (2) Istanbul Teknik Universitesi, Ayazaga Kampusu, Avrasya Yerbilimleri Enstitusu, 34469, Istanbul, Turkey, (3) Eskisehir Osmangazi Universitesi, Jeoloji Muh. Bolumu, 26480, Meselik, Eskisehir, Turkey

The North Anatolian Fault (NAF) is a 1500-km-long dextral strike-slip fault zone, which was ruptured as westward migration of large earthquake series, started by 1939 Erzincan event in the east and ended by 1999 Izmit and Duzce events in the west during the last century. There are only two unruptured segments, Marmara and Yedisu faults which create a high seismic risk for both the Marmara region and eastern Turkey. Last historical events are recorded to be 1766 AD and 1784 AD respectively in the earthquake catalogues on these faults. In the framework of TUBITAK project no 106Y174, we have studied the fault geometry and paleoseismicity of the Yedisu Seismic Gap by both aerial photo analysis and field observations. The Yedisu fault has a length of nearly 70 km with N110 strike between Avcilar, Erzincan (39.61N, 39.83E) and Yedisu, Bingol (39.43N, 40.54E). Fault strands show clear morphological features such as tectonic linearities, offset drainage patterns, shutter and pressure ridges, linear valleys, and a wedge-shaped basin, which are all characteristic features of a strike-slip fault. Three trenches were excavated at the western and eastern parts of the Yedisu fault to evaluate the seismic history of the region. Sarikaya trench (36.60N, 39.85E; located at the east of Avcilar village) points out clear stratification and structural relationships of two paleoevents, while another one, Karapolat trench (39.45N, 40.48E; located in the middle of the Yedisu basin) indicates two (possible three) paleoevents. Radiocarbon dates of samples taken from both trenches, gave relatively very old ages, which are most possibly signs of dated reworked material. After those, Tokmanik trench is excavated just two hundred meters east of Karapolat trench site in a new campaign. A bulldozer type excavation was done to reveal much older paleoevents on an alluvial fan deposits just next to an 80 m offset stream. Stratification consists of fan deposits and related channels. Tilted bedding shows an uplift due to a pressure ridge which is elongated just at the south of the trench location. Structural relationships, exposed at trench walls, indicate at least five (possible seven) paleoevents. The dating processes are still ongoing for samples, which were taken both for OSL and radiocarbon methods.