



Morphotectonics of Troy fault (NW Turkey)

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Troy fault is a normal fault located at Biga Peninsula, NW Turkey. Its structural setting is roughly associated with the westernmost splaying of the North Anatolian Fault Zone, although there are no indications of lateral displacement. Troy fault is an ENE-WSW to NE-SW trending structure that deforms the Neogene Çanakkale Formation, consisting of conglomerate, fossiliferous sandstone and siltstone, while at its north-easternmost end it deforms the Denizgören ophiolitic mélangé (Upper Cretaceous). The fault length is *ca.* 10 km, but it is possible that it extends for another 2-3 km to the west, its extension being covered by Karamendere (Skamandros) river deposits. The fault scarp is not very prominent and it is the boundary between rocks of the Çanakkale formation to the south and quaternary fluvial deposits to the north. A series of mature, occasionally overlapping, alluvial fans is formed along the fault scarp, due to the deep erosion of transversal streams. At the foothills of the fault scarp, an elongated valley is formed, through which river Dümrek (Simois) is flowing. Flow of the river is seasonal, with local pods and marshes, while present and older riverbed morphology seems to be controlled by the fault. Three distinct segments can be identified according to geological mapping and geometric criteria: Tevfikiye, Halileli and Dümrek segments (W to E). Boundaries between the segments are defined by jogs and change of strike. A number of morphotectonic indices have been calculated for these segments. According to the fault scarp sinuosity index, indicating the level of recent fault activity, Tevfikiye and Halileli segments are the most active ones (1.15 and 1.49 respectively), while Dümrek segment is far less active (2.52). The normalized fault scarp height vs. distance from the start graph, shows clearly that there is a distinct discontinuity between Halileli and Dümrek segments, while Tevfikiye and Halileli ones behave in a continuous manner. Furthermore, the transversal valley width-height

ratio shows that while Tevfikiye and Halileli have the same characteristics, Dümrek segment shows far higher values, indicating a mature stage of erosion (i.e. less fault activity). Thus, based on morphotectonic quantitative characteristics, Tevfikiye and Halileli segments may be considered as one, uniformly behaving segment (hereby called “Troy segment”), while Dümrek segment is a much less active one. Based on the fault length, its estimated highest probable earthquake magnitude is M_s 6.5.