



## **Late Quaternary activity of the Ecemiş Fault Zone, Turkey; implications from cosmogenic $^{36}\text{Cl}$ dating of offset alluvial fans**

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The Ecemiş Fault Zone is the southernmost segment of the Central Anatolian Fault Zone. The tectonic trough of the fault zone defines the boundary between the Central and Eastern Taurides Ranges. The presence of faulted alluvial fans and colluvium within this trough provide favorable conditions to unravel the Late Quaternary slip-rate of the fault zone by cosmogenic surface exposure dating. In this context, we focused on the main strand of the fault zone and also on the Cevizlik Fault that delimits the mountain front of the Aladağlar, Eastern Taurides. Geomorphic mapping and topographic surveying indicate four different alluvial fan levels deposited along the main strand. Our topographic survey reveals  $60\pm 5$  m horizontal and  $18\pm 2$  m vertical displacement of the oldest fan surface (AF1) associated with the main strand of the fault zone. We dated the surface of the AF1 with 13 cosmogenic  $^{36}\text{Cl}$  samples. Our results indicate that the AF1 surface was abandoned maximum  $105.3\pm 1.5$  ka ago. Accordingly, we propose  $0.57\pm 0.05$  mm/yr horizontal and  $0.17\pm 0.02$  mm/yr vertical mean slip-rates since 100 ka for the main strand. On the other hand, we measured  $20\pm 2$  m vertical displacement on the colluvium along the Cevizlik Fault. The surface exposure age of the colluvium yielded  $21.9\pm 0.3$  ka that translates to  $0.91\pm 0.09$  mm/yr vertical slip-rate for the Cevizlik Fault. Our results reveal significant Quaternary deformation, and low strain rates might indicate very long earthquake recurrence intervals along the fault zone.