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Paleoseismic Trenching on the southern part of Tuzgölü Fault Zone, Central Anatolia, Turkey.

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The Tuzgölü Fault Zone (TFZ) is an important intracontinental active fault of the Anatolian Platelet. However the structural features of the zone have been cited in several studies, any paleoseismological data about this fault zone has not been revealed until now. TFZ is an approximately 200 km-long, 2-25-km wide, NW trending, active, normal (with minor right lateral strike slip component) fault zone. It is located between north of Tuzgölü (Salt lake) to the northwest and the Kemerhisar (Niğde) town to the southeast.
Based on the air photo interpretation and fault mapping studies, thirteen geometric fault segment have been defined on the TFZ. The length of these fault segments differs from 4 to 28 km.
According to the geological fault length and morphotectonic features, Akhisar-Kılıç segment (AKS) is one of the most important segment of TFZ with its 25 km lenght. It is a N25°to 30°W trending, normal fault segment with minor right lateral strike-slip component and locates between Aksaray city to the northwest and Hasan Mountain to the southeast.
In this study, we present preliminary results of trench survey performed on the AKS. At the Baglarkayasi location (BT: Bağlarkayası trench; GPS coordinates: 603176 E – 4232753 K), a cross trench was excavated on a topographic depression approximately in the central part of the AKS. A microtopographical map of the trench area in scale of 1/500 has been generated and then trench site has been plotted on the map.
For the trench site selection, the fault outcrops, morphotectonic features, electric resistivity profile obtained the vertical electrical sounding data have been used. BT was excavated almost perpendicular to the fault as 94-meter long, 5-meter wide and 5-meter deep (max depth is 8.5-meter). While the northern part of the trench (40 meter long and approximately 3-meter-deep) was excavated as a single slot trench, the southern part has been built by multi-bench trench technique. The manual of trench logging method has been applied to the whole trench. For the important parts of the trench, like district of fault-plane, the photomosaics has been formed. In this study, we applied a new method for photographing of paleoseismic studies. Three-dimensional panoramic photographs have been taken at the fifteen determined stages of trench. Then, a virtual tour of trench has been obtained with combining of all these stages. Three-dimensional panoramic photographs have also been taken will provide convenience for interpretations.
Nine different microstratigraphic unit were identified in the BT. The first two of these units which are relatively older, have been interpreted as volcanic ash-block flows of Hasan Mountain volcanism. The relatively young units are associated with plinian activity and fluvial processes. Three different deformation zones have been defined as master strand, antithetic and syntethic faults within the BT.
At least three paleoseismic events have been described in BT by taken into consider the stratigraphic relationships of microstratigraphic units, upward terminations of fault strands and geometry of fault colluvial wedge criterias. Carbon material is limited inside of microstratigraphic units of BT, bacause of the trench units are mainly consisted of from volcanic ashes. Additional excavations on the vicinity of BT was conducted in order to find the datable material. Some bones are found in an excavation located 100 mt SW to BT which can also be correlated with the microstratigraphic levels of BT. According to the anthropologists, these bones belong to a human. 19 samples from BT and 7 samples which two of were bones from the additional trench, have been sent to Beta Analytic Inc. Lab. for C-14 analysis and results are being waited.

Key words: Paleoseismology, Trench, Tuzgölü Fault Zone, Three Dimensional Panoramic Photographing, 14-C dating.