P16-6 FAULT PATTERN IN THE SOUTHERN PART OF THE SIMITLI GRABEN (SW BULGARIA)

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The field investigations in the Simitli graben (SW Bulgaria) during the last years were connected with a detailed mapping of the geological hazard processes (Dobrev, 1999). This work included descriptions and mapping of different hazard phenomena (landslides, etc.), as well as a detailed mapping of the fault pattern. Additionally, the present studies were helped by data obtained by boreholes, geophysical studies and chemical analyses of ground waters. The preliminary results from the field trips were compared with the geomorphological features of the research area. A map of the fault pattern was made. It is the most complicate in the southern part (Fig. 1) where the crossing point of two significant fault structures (Strouma and Kroupnik Fault zones) is. In this part of the graben, significant surface deformations of a strong earthquake in the beginning of this century (04.04.1904, M=7.8) are seen up to the present.

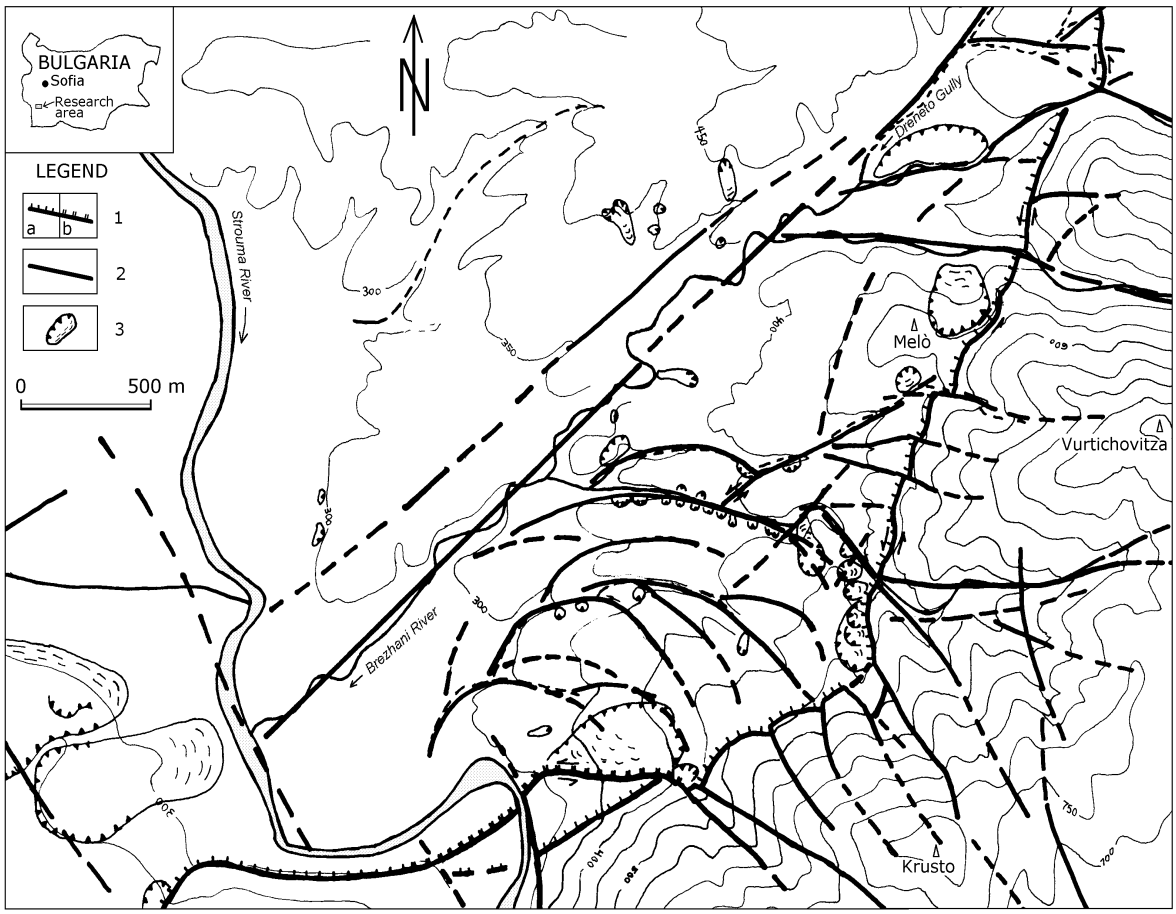
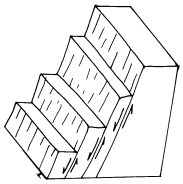
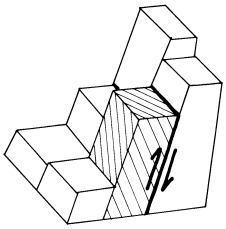
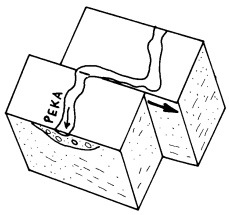
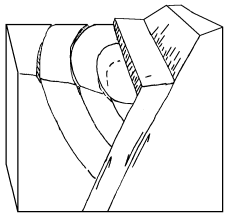


Figure 1. Fault pattern in the southern part of the Simitli graben (after Dobrev, 1999): 1 - Kroupnik fault: a) the main fault trace; b) seismogenic rupture arisen in 1904; 2 - other fault; 3 - landslide

So obtained fault pattern show an superposition of different kinds tectonic blocks which are generalized in the Table. 1.

Table 1. Fault block features established in the research area (after Dobrev, 1999)

Type of tectonic movements	Sketch	Locality, characteristic features
Normal faulting (step faults)		Along the Kroupnik and Strouma faults: The most significant step fault predetermines the recent beds of Brezhani River and Dreneto Gully. The realized vertical movement exceeds 900 m. The horst along the Kroupnik fault trace is cut into numberous subparallel step faults ("slices") with vertical displacement 1-5 m usually.
Local thrusting (block along the Kroupnik Fault with local reverse movement)		At Melo Hill: Local block built by Neogene sediments has reverse movements. That is confirmed by the extensometric monitoring performed here as well as by some geomorphological features (Dobrev, 1999).
Lateral strike-slip		Kroupnik step faults are sinistral, its transverse faults - dextral (in more cases).The faults of the Strouma zone are dextral, too. In the most cases, Kroupnik Fault can be characterized as normal-sinistral oblique-slip (c.f. Angelier, 1994) in each its section divided between two neighbour transverse faults.
Gravitational antithetic deformations		Southern part of the graben - between Brezhani River and the flanked horst: There, the gullies are formed along semi-circular surface deformations (see Fig. 1). There are shallow landslides, which are antithetic to the Kroupnik Fault, as well. These semi-circular structures mark the zone of the most active subsidence. These deformations could have a seismic origin as analogical cases in the world practice have been already depicted (Meyer et al., 1996).

Acknowledgements

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References

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Meyer, B., R. Armijo, D. Massonet, J.B. de Chabalier, C. Delacourt, J.C. Ruegg, J. Achache, P. Briole, & D.Papanastassiou. 1996. The 1995 Grevena (Northern Greece) Earthquake: Fault model constrained with tectonic observations and SAR interferometry. *Geophysical ResearchLetters*, 23 (19): 2677-2680.