

Strike-slip deformation in the Trakia Unit along the Maritsa shear zone, northern border of the Rhodope Massif, southern Bulgaria

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The studied area is situated between the towns Krichim and Kostenec along Maritsa River valley. The project is concentrated on the border between the northern parts of West Rhodopes and Central Srednogorie zone, which is part of the Trakia unit (Sarov et al., 2006). The present study gives data about the main features of this unit west of the Vucha River valley and also some new details about the deformation history of Maritsa shear zone.

Trakia unit consists of low grade metamorphic rocks. Marbles and mica schists containing albitic porphyroblasts (metasandstones) are widely spread in the eastern and central parts of studied area. In the western parts of the unit two-mica gneisses (probably orthogneisses), marbles and white mica schists in alternation with thin bodies of metabasites are well developed. The metamorphic mineral assemblages define upper greenschist facies of close to the amphibolite facies.

The whole volume of Trakia unit is affected by dextral strike-slip deformations along Maritsa shear zone. After a year of investigation it is possible to determine three different evolution stages. During the first stage the metamorphic rocks have been affected by strong synmetamorphic (ductile) deformations in strike-slip regime. This results in formation of subvertical mylonitic foliation trending to SE (120-140°) and clear subhorizontal or gently dipping to NW or SE stretching lineation (in some outcrops the rocks are turned into L-tectonites). During this period millimeter to meter-scale fold structures has been developed. Their hinges are parallel to the mineral lineation.

For the second phase of the shear zone evolution we presume a transtensional kinematics. The strain is decreasing, but temperatures are still comparatively high – about 450 to 500°C. During these p-T conditions and together with fluid transport within the systems a strong static recrystallization starts of the rock-forming minerals. The mylonitic fabric is overprinted and almost obliterated. The so-called “annealing” process can be observed in thin sections from all parts of the Trakia unit. Ductile deformations are localized in narrow shear zones. During this period Maritsa shear zone is intruded by several granitoids with late cretaceous age (84-78 Ma – Kamenov et al., 2002; Peytcheva and Von Quadt, 2003). Some of these igneous bodies are partly affected by ductile strike-slip shearing (Ivanov et al., 2001; Георгиев, 2003; Velichkova et al., 2004). The development of E – W elongated narrow sedimentary basins in the North Rhodopes is probably contemporaneous and cinematically linked with the transtensional movements along Maritsa shear zone during Late Alpine time.

The third stage is dominated by the development of brittle strike-slip faults in transpressional regime. Directing 100-140° these dextral faults are better expressed in the South of studied area, building up the border between the Trakia unit and the high grade metamorphic units of the Rhodopes. In transpressional settings the sedimentary basins from the North slopes of the mountain are partly overtrapped by the low-grade metamorphic rocks of Trakia unit. Referring to the age of the sediments this tectonic event is defined as post-Oligocene.