

## The Basement-cover relations: some examples from the Sakar unit and the East Rhodopes

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In this short communication we wish to emphasize some of the important differences between the Sakar unit and the Rhodope massif. They include the structure of the pre-Tertiary basement, as well as the relationships between the metamorphic basement and its Tertiary cover.

In the last years we have worked in the Haskovo district — area that is traditionally regarded as a part of the Rhodope massif (Boue, 1840; Bojanov & Kozuharov, 1968; etc.). The results of our work clearly show that this area is the most western continuation of the Sakar unit (Gerdjikov & Sarov, 2000). Similarly to the Sakar unit, the metamorphic basement in the Haskovo area is built up of 2 major stratigraphic units: volcanogenic-sedimentary complex and Topolovgrad group. These two units record an Early Alpine (120-95 Ma) greenschist facies metamorphism. The synmetamorphic evolution of these rocks can be divided to two events — D1 and D2. The main foliation in the area have been formed during the D1 event. Synchronously to the D1 event in the eastern part of the Haskovo area have been emplaced a big number of various granitoides — porphyric, equigranular and aplitoid. Structural and kinematic analysis of D1 tectonites allow us to characterize D1 as a dextral transpressional deformational event. D2 could be regarded as a north-south compression that generated east-west trending mostly upright folds developed on every scale.

This Early Alpine plutonic-metamorphic belt is covered by Palaeogene-Quaternary sediments. In fact the Palaeogene deposits in the Haskovo area are a part of the East Rhodope

depression. Detailed study of the basement-cover contact in the Haskovo area, as well as in the Sakar - east of the Maritsa river valley, shows that the relationships with the cover are normal. There are no data about faulted contacts as well as about structures in the basement related to a reactivation synchronous to the Tertiary basin formation. These findings are in contrast with the widely accepted ideas for the block structure of this part of SE Bulgaria. Jaranoff (1960) first introduced the concept for the fault-block structure of the Haskovo area. Later these ideas were developed by Boyanov et al. (1963); Boncevic and Yosifov (1984); Boyanov et al. (1984). These views do not only concern the Late Alpine structure of this part of the Sakar unit: the idea about a multistage reworking of the crystalline basement in wide lineament zone was put forward. Our research demonstrate that this interpretation is not grounded on field nor on geophysical data.

The basement-cover relations in the Sakar unit are in contrast with already well-documented deformation of the basement rocks in the East Rhodopes linked with the formation of the East Rhodope Tertiary depression. Intensive ductile and brittle deformation in the basement rocks are due to the formation and development of the Late Alpine extensional domes in the Central and the Eastern Rhodopes (Ivanov, 1998). In fact sedimentary fill and volcanics of the southwestern parts of the East Rhodope depression form the hanging wall of the detachment faults that bounds the exhumed high-grade cores of the Late Alpine domes. The basin subsidence and the formation of normal

fault-bounded tilted blocks in the area southwest from Kardzali are linked with the activity of the Borovishka strike-slip zone. This zone is an array of dextral strike-slip faults, which are easy to trace in the area of Kobiliane-Kardzali. The lowermost sediments in this area build up a succession of coarse polygenic breccias of supposed Middle Eocene age. They are overlain by a succession of sandstones, limestones and tuffs. In the area of the village of Rusalsko, the mylonites of the Borovishka zone are sealed off by lower Oligocene intermediate lavas and lava-breccias. These relations constrain the age of the fault activity along the southwestern margin of East Rhodope depression between middle Eocene and early Oligocene.

Another important point is that in the Rhodopes Tertiary sedimentation have been synchronous to a tectonic activity. Evidence for that conclusion are ample: olistostromes, slumps and synsedimentary folds in the East Rhodope depression are noted by many of the previous investigators (Boyanov et al., 1963; etc). Such features were not found in the Tertiary sediments in the Sakar unit.

All these data clearly show that the forma-

tion of the Tertiary basin was controlled by the extensional faulting in the East Rhodopes.

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