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Metamorphic and tectonic events around the south contact of the Rila - Rhodopean batholith

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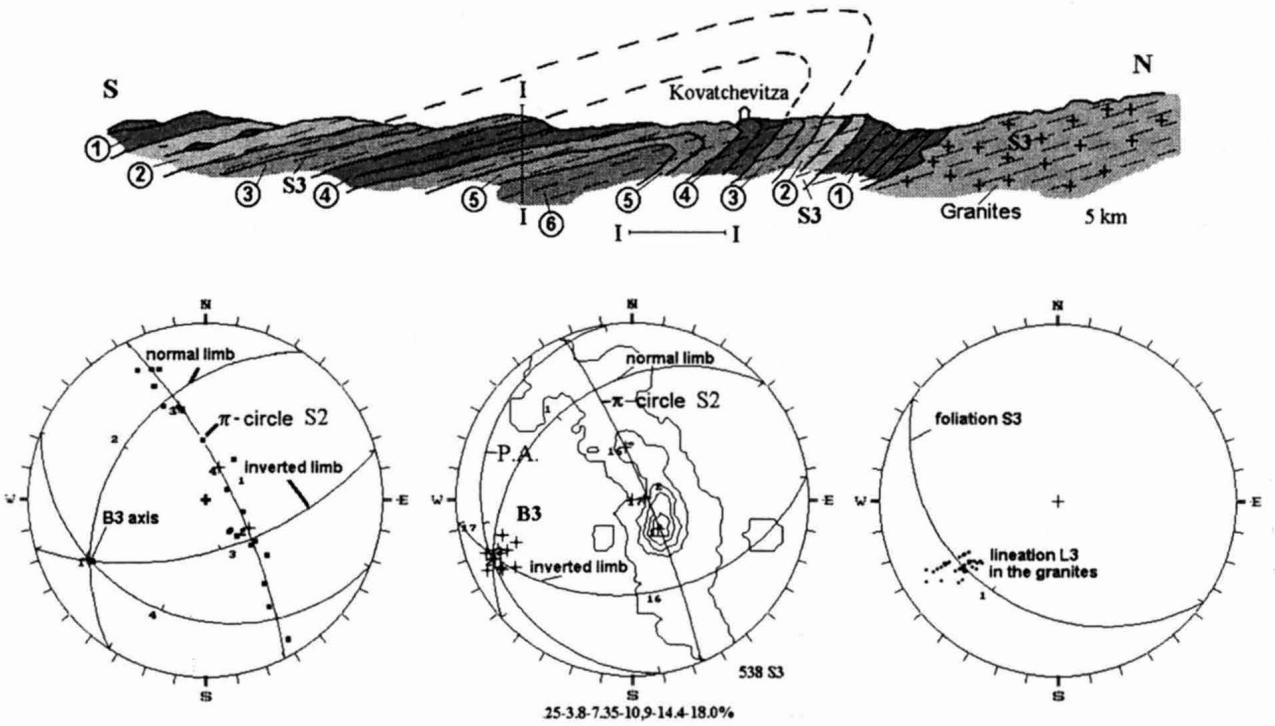
The deep valley of Kanina river exposes the granites from the southern contact of Rila-Rhodopean batholith together with their high grade metamorphic envelope. The metamorphic complex is highly complicated unit, where Boikovo, Bachkovo and Lukovica Variagated Formations are separated (Кожухарова, 1987; Кацков, Маринова, 1992; Кожухаров и др., 1992). Our field observations and considerations concern the area around Kanina river, between Kovachevitza, Ribnovo, Skrebatno and Gorno Dryanovo villages, where the Formations in question are widely spread. Fine-grained gneisses, with diverse composition, crop out there. Their detailed stratigraphical subdivision has not been done yet. Fine-grained amphibolites, marbles, mica schists, leptite-like rocks in form of layer with different thickness (from several cm to several tens of m), interlayer the gneisses. The gneisses are intensely sheared, meso- to melanocratic, mainly biotitic ones, with transitions to biotite schists and more rarely - to amphibole-, amphibole-biotite, two mica-, or muscovite gneisses. Numerous metamorphosed ultrabasic bodies, not very large in size, crop out on the west slope of Kanina river. They are amphibolized or serpentinized, emplaced before the deep metamorphic transformation of the country rocks. The main rock-forming minerals are biotite, plagioclase (oligoclase-andesine), quartz. Amphibole, muscovite, microcline, garnet, epidote in variable quantity also take part. The significant quantitative changes in the mineral composition is the main reason for the great variety and frequent lithological transitions.

The presence of two clearly distinguished morphologically migmatic injections is a characteristic feature of the metamorphic complex. The first one is with granitoid composition, medium-grained, without sharp contacts, likely simultaneously formed in situ to the microcline porphyroblasts in metamorphites. The second injection is fine-grained, quartz-feldspatic in composition, aplitic, clearly different from the host rocks. It intersects the metamorphic complex. The distribution of the migmatic injections and their morphology have been controlled by the surfaces of an early foliation. Later it has been intensely deformed, transformed and almost entirely erased. Another characteristic feature of the metamorphic complex is its retrograde alteration, manifested intensely all over the rocks. It has been accompanied by multiple syn- and post-tectonic recrystallization, realized in the conditions of continuos regression of the regional metamorphism to the degree of epidote-amphibolitic facies. A partial or complete re-organization of mineral composition, structure and texture has been performed, in connection with this intensive tectonic and metamorphic transformations.

The metamorphic complex is affected by repeated tectonic transformations. Traces of pre-metamorphic structures, textures or deformations are not preserved. Therefore, the interpretation of lithological contacts as stratigraphical boundaries is problematic. Earliest foliation S1, marked by the migmatic injections contacts, is folded in isoclinal structures B2. The folds are several cm to several m, with amplitude exceeding several times the length of the fold wave. The axial plane is the second foliation S2. Parallel to B2 axes is formed lineation of intersection L2 and mineral or aggregate lineation L2. In connection with the later deformations of



S2, the lineations B2, L2 and L2 dip from ENE to WNW. The third foliation S3 is an axial plane of numerous folds B3 of different scale. It intersects S2 under different angles: S3 and S2 coincide on the limbs of regional B3 fold, while on the axial plane, they intersect under a straight angle, for example - in the valley of Kanina river, just west of Kovachevitza village. The model of minor folds changes regularly too. From Z-shaped folds in southwest, through M- or W-shaped around the axial plane, they become S-shaped to northwest and near the contact with the granitic batholith. A common feature of the regional structure is the interference between B2 and B3 folds. While S3 foliation dip slightly to NW and NNW, the B3 folds with their associate intersection lineation L3 and the biotite mineral lineation dip to the WSW.

The foliation S3 in the West Rhodopean batholith is penetrative into granites of the south contact of the intrusion dipping to NW and NNW. S3 causes destructive alteration of the granites, manifested by the fragmentation and microgranulation of the rock-forming minerals. The biotite recrystallization, its partial or entire replacement by muscovite, the appearance of epidote, etc. are realized along the same S3. The same orientation of mica's lineation, the S3 in the granites, as well as this lineation in the country metamorphites, is an indication for their synkinematic manifestation and formation during the same time.

The comparison of the metamorphic and tectonic events around the south contact of Rila-Rhodopean batholith poses many problems. First of all it appears, that the granitic pluton, probably long after its intrusion, along with the country metamorphites, have been altered by an intensive deformation and metamorphism in the conditions of epidote-amphibolite facies. In connection with this arise questions about the behaviour of isotopic systems (K/Ar, Rb/Sr, etc.) and the interpretation of the determined geological ages. Another problems concern the relationships between the geological bodies, metamorphic rocks' structure and the established regional stratigraphy. Some problems arise about the correlations with well-studied neighbouring regions (Димитрова, Белмустакова, 1986; Кожухарова, 1987). Prior to the publications of the detailed structural data it has to be mention that our observation does not confirm the existence of Kovachevitza syncline.

References

Бояджиев, Ст. 1962. Метаморфните скали в Западните Родопи. - *Прин. към Геол. на Бълг.*, 1; 149-178.

Димитрова, Е., Белмустакова, Х. 1986. Петрология на Долнодряновския плутон (Западни Родопи) и неговата метаморфна рамка. - *Геохим. Минерал. и петрол.*, 20 — 21; 69-96.

Кацков, Н., Маринова, Р. 1992. *Обяснителна записка към геоложка карта на България М 1 : 100 000. Картен лист Белица*. София. 43 с.

Кожухаров, Д. et al. 1992. *Обяснителна записка към геоложка карта на България М 1 : 100 000. Картен лист Гоце Делчев*. София. 67 с.

Кожухарова, Е. 1987. Луковицкая пестрая свита в Гоцеделчевском районе Западных Родоп. - *Geologica Balc.*, 17, 1; 33-45.