4.8.0. GEODYNAMIC INVESTIGATIONS IN SERBIA AND MONTENEGRO

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Geological structure of the territory of Serbia and Montenegro is result of influence of several factors, first of all: 1. *sedimentation and geodynamics within this part of Mediterranean geosyncline*; 2. *underthrusting of African tectonic plate under Eurasian one*; 3. *intensive neotectonic movements*; 4. *forming of very expressed exogenous relief*.

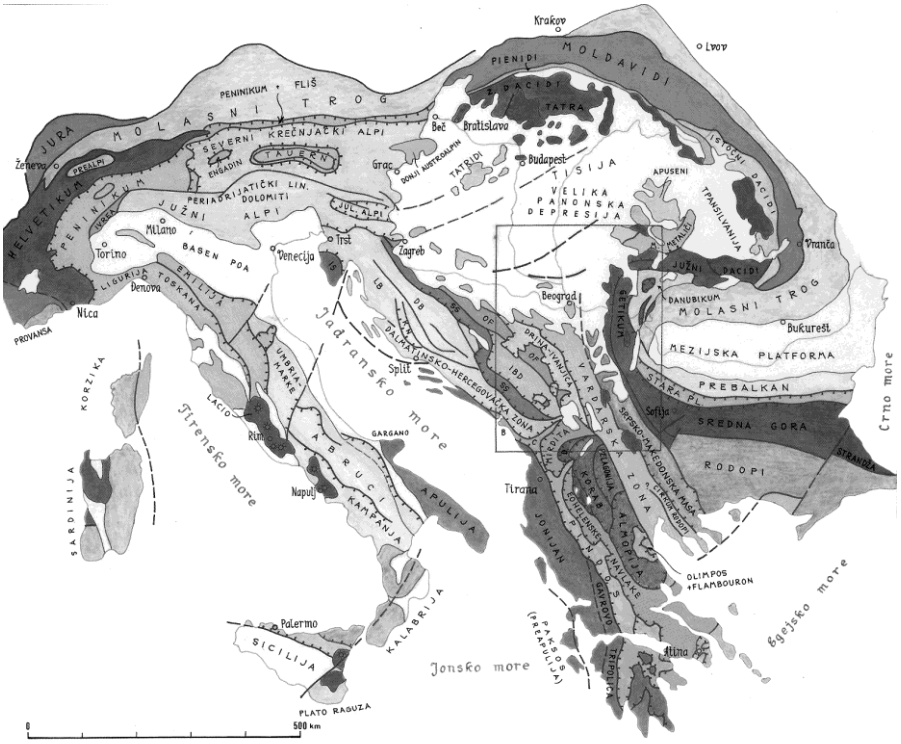

Fig. 4.8.0.1. Geological map of Serbia with adjacent regions (Geological Atlas of Serbia, 1997)

That is why the study area is characterized not only by different lithostratigraphic content and complex tectonic structure, but also by unique geomorphologic, engineering-geological, hydrogeological and seismotectonic conditions (Fig. 4.8.0.1.).

At the northern Mediterranean, the lateral strain from the contact zone between African and Eurasian plate are transferred through the Adriatic micro-plate to the Dinarides – in the NE direction (Glavatovic, 2004). Strain concentration within lithosphere of Dinarides is performed by complex process of the segments moving through the Adriatic micro-plate (bellow the sediment complex, covering silicate and basalt rocks and the rest of lithosphere, in the direction of subducting Apennine plate – to the Tyrrhenian Sea).

Strong lateral stresses are also produced by thick sediment complex of Adriatic plate (up to the level of Triassic clastite), which is resistant to the horizontal deformation in the Adriatic region, simultaneously generating strong tectonic processes in the outer and inner Dinarides. As a result, horst and graben structures are formed, as well as mountain massifs, tectonic depressions, trenches, nappes and faults (normal, reverse and transform). System of normal and reverse fault structures are predominantly oriented parallelly to Dinarides. These faults are mostly with regional dimensions, with dipping angle toward land 20-50 degrees. Transcurent faults are mostly generated perpendicularly to the previous ones, with small dimensions and steep slope of the fault plane.

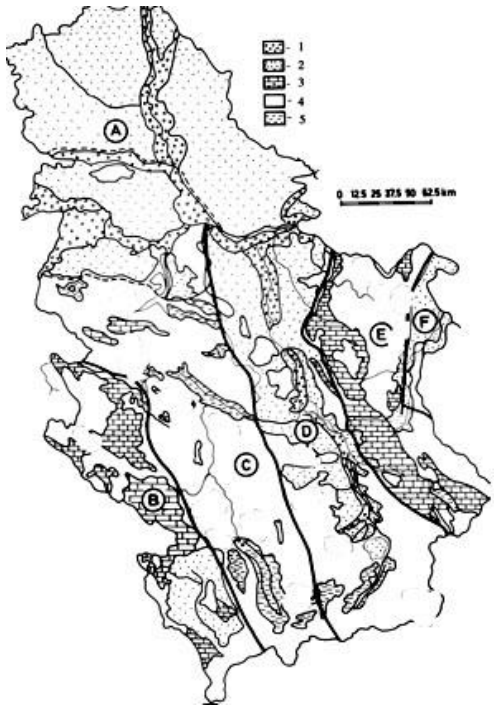

Fig. 4.8.0.2. Geotectonic zoning of Serbia (Komatina-Petrovic et al., 2005)

Presented geotectonic units (Fig. 4.8.0.2.) of the first order are marked by the following features:

1. *Morphologically distinguished Dinarides* and *Carpatho-balkanides* are characterized by significant neotectonic activity, but also by karst type of relief, aquifers discharging through strong karst springs and predominantly engineering-geologically suitable terrains;

2. *Vardar zone* is presented by predominantly weakly hard to hard rocks, anisotropic, extremely fissured and altered, medium to low deformability. These formations are low-permeable, with fissured porosity and numerous springs of very low yield.

3. Recent depressions (*Pannonian and Dakian basin*, depressions within *Serb Macedonian mass)* are characterized by uncemented to weakly cemented soft rocks of alluvion and Neogene lake basins. Main water-bearing medium present alluvial gravels and sands of the Velika Morava valley and its tributaries, as well as Pleistocene clay and sand complexes of Pannonian basin. Areas of Neogene basins are predominantly unstable, with numerous landslides, and plains of the Sava river near Belgrade under

risk of liquefaction (the same is with Adriatic coast of Montenegro and Skadar lake coast within zone of Dinarides).

In Fig. 4.8.0.3., block-diagram of the bigger part of Serbia is presented. It was constructed according to digital elevation model, based on topographic map, scale 1:1,000,000. Over this model, the Landsat-3 images of the area were overlaid. The picture displays 3D perspective view of the terrain with all details visible in given scale.

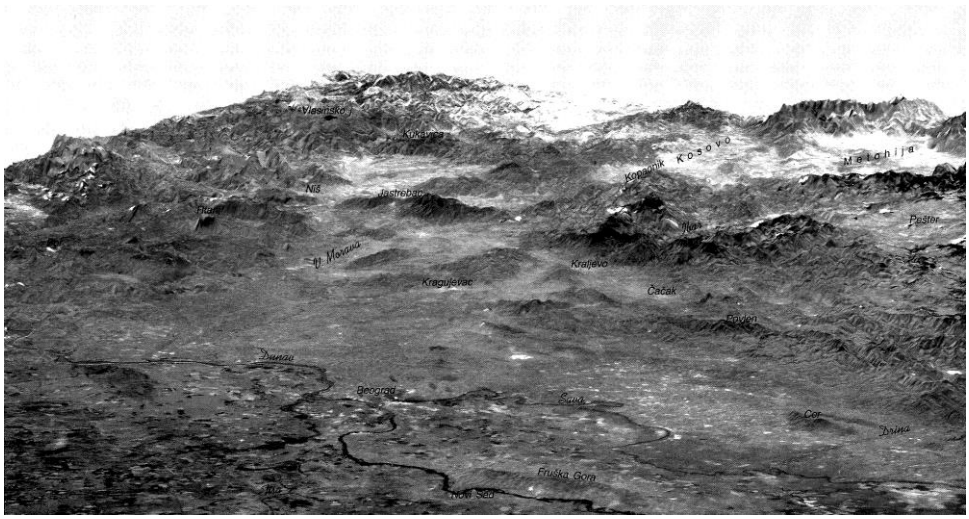

Fig. 4.8.0.3. 3D-view of the bigger part of Serbia. The digital elevation model construction and its connection with the satellite images were performed by the GRASS and ERMappe r software packages (Geological Atlas of Serbia, 1997)

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