



## **New insights of the eastern edge of the Tisza block (South Apuseni mountains)**

**M. Marin**

Geologisch-Palantologisches Institut, University of Basel, Switzerland

E-mail: mihai.marin@unibas.ch

The Apuseni mountains are situated inside of the Carpathian belt, between the Transylvanian and Pannonian basins. Representing the largest outcropping part they offer an unique opportunity for establishing a structural-tectonic profile across the eastern Tisza block. The northern part of the Apuseni mountains represents the lowermost level of the Tisza microplate - Codru and Biharia nappe systems thrusts onto the Bihor autochthon during the intra-Turonian phase. Further south, and within the structurally higher nappe systems, in the Transylvanian (= South Apuseni) nappe system there is an ample evidence for a polyphase evolution. During the first stage, i.e the latest Jurassic, the ophiolites of the Transylvanides were transgressed by a shallow marine carbonate platform (Stramberg facies), indicating the obduction of these ophiolites. Deformation during the Mid-Cretaceous "Austrian phase", not recorded in the North Apuseni, led to the closure of the Transylvanide ophiolite belt (=easternmost branch of the Vardar ocean). "Laramian" deformation at the Cretaceous-Tertiary boundary shaped most of the major thrusts within the South Apuseni. The eastern edge of the Tisza block is hidden underneath the Transylvanian basin.

The main focus in the Apuseni mountains was directed to the southern part of the system in order to better constrain the tectonic history of the ophiolitic obduction onto the Tisza continent.

In the South Apuseni mountains, the Biharia complex is overlain by a stack of tectonic units mainly represented by the Grosi, Cris, Tecereu - Drocea, Cabesti, and Bejani nappes in the west and respectively by the Fenes, Techereu - Drocea, Bedeleu, and Bozes nappes in the east. These units are basically made up of Cretaceous sedimentary succession overlaying the ophiolitic deposits.

New kinematic data have been acquired mainly from the Fenes and Bedeleu nappes in order to derive the tectonic history. Fenes nappe consists of a cretaceous sedimentary formation, mostly turbiditic type. Bedeleu nappe (senso strictu) is build up from basic volcanic rocks with an oxfordian-lower tithonian age covered unconformable by upper Jurassic Stramberg type limestones and Aptychus beds.

Two main phases of deformation are documented after the obduction of the ophiolitic complex on top of the continent: Mid-Cretaceous tectonic phase (known as the Austrian phase) and the upper Cretaceous phase (Laramian).

The field data confirm the polyphase history recorded in the Fenes and Bedeleu nappe. The main deformation style is folding type. The strike of the structures is NNE to SSW directed, in a good agreement with the subsurface data from the Transylvanian basin.

#### References:

Balintoni, I. 1994: Structure of the Apuseni Mountains. In: ALCAPA II Field Guidebook "South Carpathians and Apuseni Mountains". Romanian Journal of Tectonics and Regional Geology, 75, Suppl. 2, 37-58.

Bleahu, M., Lupu, M., Patrulius, D., Bordea, S., Stefan A. and Panin, S. 1981. The Structure of the Apuseni Mountains. Guide to Excursion B3. 12. Congress of the Carpatho-Balkan Association, Institute of Geology and Geophysics, Bucharest, 107pp.

Sandulescu, M. 1984. Geotectonica Romaniei. Editura Tehnica, Bucuresti, 336 pp.

Sandulescu, M. 1994. Overview of Romanian Geology. In: ALCAPA II Field Guidebook "South Carpathians and Apuseni Mountains". Romanian Journal of Tectonics and Regional Geology, 75, Suppl. 2, 3-15.