Geophysical Research Abstracts, Vol. 9, 09802, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-09802

Age and timing of flysch development in the Dinaride foreland basin system

T. Mikes (1), M. Báldi-Beke (2), M. Kázmér (3), I. Dunkl (1), H. von Eynatten (1)

(1) Sedimentology/Environmental Geology, Geoscience Center Göttingen, Germany, (2) Rákóczi u. 42, H-2096 Üröm, Hungary, (3) Dept. of Palaeontology, Eötvös University Budapest, Hungary (tamas.mikes@geo.uni-goettingen.de / Fax: +49 551 397996)

Upper Cretaceous to Tertiary siliciclastic flysch unconformably covers the Cretaceous shallow marine platform carbonates of the Apulian foreland and of the External Dinaride thrust belt. The stratigraphic age of the clastic Tertiary has been traditionally placed into the Eocene and a SE-directed orogen-parallel diachronity was proposed among the sections (e.g. Piccoli & Proto Decima, 1969). More recent biostratigraphic results by de Capoa et al. (1995) indicated that in Central Dalmatia and to the SE, the flysch formation lasted up to Early Tortonian. Relics of Upper Cretaceous flysches are found in the inner part of the Dinarides (Bosnian and Durmitor Flysch, smaller patches of Cretaceous deep-marine clastics near Zagreb).

We present new calcareous nannoplankton data from several stratigraphic sections in the Dalmatian flysch zone. Areas of the extensive regional sampling include the Trieste-Koper and Pazin Basins in Istrian Peninsula, Pag Island, Šopot section near Benkovac, Split area, and Montenegro. The youngest nannoplankton assemblages correspond to the zone NN4-6, placing most of the flysch into the Lower-to-Mid-Miocene, most probably Langhian. In addition, much reworked species are commonly found from the Upper Cretaceous, and from the Middle and Upper Eocene – many of them have non-overlapping stratigraphic ranges. The obtained Miocene ages of deposition are rather uniform throughout the flysch zone, which does not support the idea of diachronity.

Our new biostratigraphic results indicate that deposition of flysch did not generally start with the drowning of the Eocene foraminiferal ramp as widely accepted. We conclude that:

1., The reworked Upper Cretaceous nannoflora requires that extensive pelagic environments existed much behind the present-day thrust front already since the Late Cretaceous.

2., Present-day position of the flysch basin is a result of migration of the orogenic deformation front in the Tertiary. During permanent convergence, the Cretaceous depozone has continuously migrated towards the Apulian foreland. The mass of clastic sediments, originating partly outside the Dinarides, has been cannibalized by submarine erosion and repetitively re-deposited in the migrating basin.

3., Basin migration is proposed to have taken place in a series of SE-NW elongated wedge-top or piggyback basins.

4., By Mid-Miocene, erosion of older flysch from top of the advancing Cretaceous carbonate thrust wedge was completed, and flysch depozone switched to the Apulian foredeep. This is supported by coarse “molasse” sediments that prograde onto the Miocene flysch: they are dominated by carbonate clasts, and their pebble spectra retain the inverted stratigraphy of the Cretaceous carbonate platform covered by thin foraminiferal limestones and flysch.

5., On Apulia, and locally on the outermost nappes, there should be a widespread regional unconformity between the Eocene and the Lower-to-Mid-Miocene.

6., The main phase of uplift of the outer Dinaride nappes began in the Miocene.

References

de Capoa, P., Radoičić, R. and D´Argenio, B. 1995. Mem Sci Geol 47: 157-172

Piccoli, G. & Proto Decima, F. 1969. Mem Inst Geol Miner Univ Padova, 27:3-21