



## **Depositional age and palaeoclimatic signal, Upper Cretaceous continental deposits, Hațeg basin, South Carpathians: isotopic and lithostratigraphic evidences**

Ana-Voica Bojar (1,3), Stanislaw Halas (2), Hans-Peter Bojar (3), Dan Grigorescu (4), and Stefan Vasile (4)

(1) Salzburg University, Geographie und Geologie, Geologie, Salzburg, Austria (ana-voica.bojar@sbg.ac.at), (2) Mass Spectrometry Laboratory, Institute of Physics, Lublin, Poland, (3) Department of Mineralogy, Studienzentrum Naturkunde, Universalmuseum Joanneum, Graz, Austria, (4) Department of Geology and Paleontology, Bucharest University, Romania

In the Hațeg basin, South Carpathians, two different continental Formations of Maastrichtian age occur: the Densuș–Ciula and the Sânpetru Formations. The Maastrichtian age of the middle Densuș–Ciula member and the Sânpetru Formation is constrained by freshwater gastropod assemblages and palinology (Antonescu et al., 1983; Grigorescu, 2010). Additionally, the age base on calcareous nannofossils, of the youngest Cretaceous marine deposits that are overlaid by the Densuș-Ciula and, respectively Sanpetru Formations, is Late-Campanian-Early Maastrichtian (Grigorescu and Melinte, 2001; Melinte-Dobrinescu, 2010). Palaeomagnetic studies were carried out for the Sibișel Formation. For the Densuș–Ciula Formation, the palaeomagnetic signal displays no consistent results (Panaiotu and Panaiotu, 2010). Bojar et al. (2010a) found high amounts of magnetic titanohematite (up to 40%) with tabular crystallographic forms in the heavy mineral fraction of the Densuș–Ciula Formation, which disturbed the primary magnetic signal. The preservation of this mineral, which is most probably of volcanic origin, was favored by the general dry and oxic conditions at the time of deposition. For the Hațeg basin, the seasonally dry to sub-humid conditions prevailed during the sedimentation of Densuș–Ciula Formation and the lower part of the deposits occurring on Sibișel Valley. These conditions were put in evidence by mineralogical and isotopic investigations of palaeosol and fossil remains (Bojar et al., 2005; Bojar et al., 2009; Bojar et al., 2010 b). Recent palinological investigations (Lindfors et al., 2010) from a site situated near Valioara, in the Densuș–Ciula Formation, also support seasonally dry conditions during the formation of the deposits.

In order to constrain the age of the Densuș–Ciula Formation and correlate it with the Sânpetru Formation, we separated and dated by K–Ar method biotites and amphibols from the volcanoclastic deposits. The mineralogy and lithology of the samples were done using X-ray diffraction and semi-quantitative determinations. Further correlations and interpretations are based on the new data presented in this study and previously published palaeomagnetic and biostratigraphy.

### References

- Antonescu, E., Lupu, D., Lupu, M., 1983. Correlation palinologique du Crétacé terminal du sud-est des Monts Metaliferi et des Depressions de Hațeg et de Rusca Montană. *Annales de l'Institut de Géologie et Géophysique* 59: 71–77.
- Bojar A-V, Bojar H-P, Ottner F, Grigorescu D, 2010 a. Heavy mineral distributions of Maastrichtian deposits from the Hațeg basin, South Carpathians: tectonic and palaeogeographic implications. *Palaeogeography, Palaeoclimatology, Palaeoecology* 293: 319–328.
- Bojar, A-V, Csiki, Z, Grigorescu, D, 2010 b. Stable isotope distribution in Maastrichtian vertebrates and paleosols from the Hațeg Basin, South Carpathians. *Palaeogeography, Palaeoclimatology, Palaeoecology* 293: 329–342.
- Bojar, A-V, Grigorescu, D, Ottner, F, Csiki, Z, 2005. Paleoenvironmental interpretation of dinosaur- and mammal-bearing continental Maastrichtian deposits, Hațeg basin, Romania. *Geological Quarterly* 49: 205–222.
- Bojar A-V, Ottner F, Bojar H-P, Grigorescu D, Persoiu A, 2009. Stable isotope and mineralogical investigations on clays from Late Cretaceous sequences, Hațeg Basin, Romania. *Applied Clay Sciences* 45: 155–163.
- Grigorescu D, 2010 a. The Latest Cretaceous fauna with dinosaurs and mammals from the Hațeg Basin — A historical overview. *Palaeogeography, Palaeoclimatology, Palaeoecology* 293: 271–282.
- Grigorescu D, Melinte M, 2001. The stratigraphy of the Upper Cretaceous marine sediments from the NW Hațeg area (South Carpathians, Romania). *Acta Palaeontologica Romaniae* 3: 153–160.
- Lindfors, SM, Csiki Z, Grigorescu D, Friis, EM, 2010. Preliminary account of plant mesofossils from the Maastrichtian Budurone microvertebrate site of the Hațeg Basin, Romania. *Palaeogeography, Palaeoclimatology, Palaeoecology* 293: 353–359.

Melinte-Dobrinescu, M.C. 2010. Lithology and biostratigraphy of Upper Cretaceous marine deposits from the Hateg region (Romania): palaeoenvironmental implications. *Palaeogeography, Palaeoclimatology, Palaeoecology* 293: 283-294.