A PILOT PALEOMAGNETIC AND AMS STUDY ON LATE CRETACEOUS RED MARLS FROM THE PIENINY KLIPPEN BELT (POLAND AND SLOVAKIA)

EMŐ MÁRTON[1], Dusan Plašienka[2], Jacek Grabowski[3], Michał Krobicki[4], Igor Túnyi[5], János Haas[6]

1. Eötvös Loránd Geophysical Institute of Hungary, Budapest, Hungary, e-mail: paleo@elgi.hu
2. Department of Geology and Palaeontology, Comenius University, Bratislava, Slovakia, e-mail: plasienka@fns.uniba.sk
3. Polish Geological Institute, Warsaw, Poland, e-mail: jgra@pgi.gov.pl
4. AGH University of Science and Technology, Cracow, Poland, e-mail: krobicki@geol.agh.pl
5. Geophysical Institute of the Slovak Academy of Sciences, Bratislava, Slovakia, e-mail: tunyi@up.upsav.sk
6. Department of Geology, Eötvös Loránd University, Budapest, Hungary, e-mail: haas@ludens.elte.hu

The Pieniny Klippen Belt (PKB) is a 600km long, strongly tectonized narrow zone of arcuated shape which separates the Central and the Outer West Carpathians. It is composed of several successions of deep and shallow water limestones of Early Jurassic–Cretaceous age. The structure of the PKB is dominated by Miocene wrench tectonics. Relics of Latest Cretaceous–Palaeocene, fold-and-thrust structures, preserved in places, point to the décollement of Jurassic–Palaeogene formations from mostly unknown and fully subducted substratum, thrust-related folding and nappe stacking. The width of the thrust and fold belt was strongly reduced by Early Miocene transpression/transtension and pervasive brittle faulting affecting sequences of rheologically variable strata of diverse palaeogeographic and tectonic affiliations and resulted in the present block in matrix structure. From this tectonically complicated belt we collected Late Cretaceous pelagic red marls at five localities, in order to trace vertical axes rotations along the arc. The samples contain hematite and maghemite, the degree of AMS is 1.9-5.3% and the stepwise thermal demagnetization usually reveals two components of the NRM. The three localities representing the eastern, NW-SE trending segment exhibit CCW rotated declinations of about 30° (both the post-folding overprint and the pre-folding remanences). The localities from the western segment are in overturned position, one of them with uniform, the other with variable tilts. The latter exhibits two CCW rotated overprint components, the lower blocking one about 30°, the high blocking components suggests somewhat larger rotation. The locality with uniform tilt is heavily overprinted, but at 650°C a loosely defined direction of possibly pre-folding age is obtained, also suggesting CCW rotation.

The two main lineation trends in the AMS fabric are ENE-WSW and NW-SE and both are in evidence on either side of the arc.

While it is too early to draw conclusions about the mechanism leading to the present geometry of the arc, our new results document the general CCW rotation of the PKB and open a perspective, since at some of the localities NRM of pre-folding age was identified.

This work was supported by Polish-Hungarian Scientific and Technological project PL-12/2008, by Hungarian Scientific Research Fund OTKA-K68171 and by the Slovak Research and Development Agency APVV-0465-06.

Pieniny Klippen Belt, paleomagnetism, AMS

Emő Márton, ELGI, Columbus 17-23, H-1145 Budapest, Hungary, e-mail: paleo@elgi.hu