# Correlation and dating of the Miocene ignimbritic volcanics in the Bükk foreland, Hungary: complex evaluation of paleomagnetic and K/Ar isotope data

**Emö Márton[1] & Zoltán Pécskay[2]**

[1]*Eötvös Loránd Geophysical Institute of Hungary, Paleomagnetic Laboratory, Columbus 17-23, H-1145 Budapest, Hungary*

[2]*Institute of Nuclear Research of the Hungarian Academy of Sciences, Bem tér 18/c, H-4001 Debrecen, Hungary*

Sampling sites for the paleomagnetic studies carried out in the area in the years of 1988–1993 were selected using the geological map and descriptions of the 1960s, for lack of more recent publications and interest in the area. These studies suggest that despite of the assumed short duration of the ignimbrite volcanism (max. a few Ma), there are two distinct groups of sites: one with about 30°, the other with 80° counterclockwise rotation. The two groups correspond to two ignimbritic events, called lower and upper ignimbrite, respectively. The match between the ignimbritic horizons and the distinct paleodeclinations is so perfect that paleomagnetism may be regarded as an excellent mapping method in this area. Apart from helping geological correlation, the paleomagnetic results are also interesting from geodynamic point of view. They imply that before and during the first ignimbritic event the area was far to the south compared with the present position and became emplaced by a first rotation of about 50° followed by a rotation of 30°, both in the counterclockwise sense.

The four K/Ar ages, that accompanied the intensive paleomagnetic studies also pointed to the short duration of the ignimbrite volcanism. However, the ages were overlapping. More recently, the area was revisited. Samples were collected for K/Ar age determination from practically all previously studied paleomagnetic sites and new sites (mostly less welded ignimbrites) were sampled, both for K/Ar age determination and paleomagnetic measurements. The now numerous K/Ar ages date the ignimbrite volcanism as of 16–19 Ma. Within this range, the paleomagnetic sites with less rotation are younger, typically of 16–17Ma. In the group with about 80° rotation, the K/Ar ages for some sites are of 17.8–19.3 Ma, but for some others the ages correspond to those of the younger group. The obvious explanation is that some of the K/Ar ages are reset, while the original paleomagnetic direction for the same sites could survive the moderate heating, since the Curie-points are typically 630°C, irrespective of composition and degree of welding. Alternatively, all the K/Ar ages may be primary. In this case, we have to calculate with relatively long-lasting first phase, and an extremely fast (within a few hundred thousand years) movement of the area in the time interval of 16–17Ma.

Finally, it is worth pointing out that both methods found that some ignimbritic deposits must be considerably younger than the above discussed horizons (age about 13 Ma, no declination rotation), i.e. the geological map at certain points calls for revision.