

Magnetostratigraphic framework for the late Miocene mammalian fossils in Maragheh, NW Iran

MOHAMMAD PAKNIA¹, JOHANNA SALMINEN¹, ANU KAAKINEN¹, MAJID MIRZAIIE
ATAABADI², GHOLAMREZA ZAREE³, MIKAEL FORTELIUS¹

¹*Department of Geology and Geosciences, University of Helsinki, Finland*

²*Department of Geology, University of Zanjan, Iran*

³*Department of Environment Office in Maragheh, Iran*

Maragheh in northwestern of Iran is a world famous Miocene fossil bearing area. The area has yielded classical late Miocene Turolian age fauna that has been collected and studied sporadically over the last 150 years.

However, most of these expeditions focused on the collection of fossils and description of new taxa, while much less effort was put on stratigraphy and age of the fossil occurrences. For example, magnetostratigraphy was not applied in the Maragheh area until preliminary work in the 1970's.

In order to provide a time frame for the late Neogene Maragheh sequence, we measured and sampled ca. 26-m-thick stratigraphic section at Dareh-e Gorg for paleomagnetic analysis. Paleomagnetic samples were collected every 20–50 cm and analyzed using alternating field and thermal demagnetisation methods. Samples yielded characteristic remanent magnetization (ChRM) carried by magnetite. Positive reversal test (McFadden and McElhinny, 1990) indicates that ChRM is primary and that it is not contaminated due to secondary components. Our data indicate that the sampled Dareh-e Gorg sequence consists of three magnetozones, the middle part of the section at around 15–21 metres showing reversed polarity, bounded by normal polarities above and below. Based on the paleontological constraints and recent K-Ar age determinations from the Maragheh Fm, two correlations to the geomagnetic polarity time scale of Gradstein et al. (2012) seem possible. The first option places the magnetozones to C3Br.1n through C3Bn (7.285–7.140 Ma). Alternatively, the polarity sequence may be correlated to chrons C4n.1n to C3Br.2n (7.642–7.454 Ma).

References:

Gradstein, F.M., Ogg, J.G., Schmitz, M.D., Ogg, G. M., 2012. The Geologic Time Scale. Elsevier, Amsterdam.

McFadden, P. L. and McElhinny, M. W. 1990. Classification of the reversal test in palaeomagnetism. *Geophysical Journal International* 103: 725–729.