

K/Ar DATING OF TERTIARY MAGMATISM IN HUNGARY

PÉCSKAY, Z. & BALOGH, K. (Institute of Nuclear Research of the Hungarian Academy of Sciences, Debrecen, Hungary)
E-mail: pecskay@atomki.hu

Much geochronological data has accumulated during the last decades enabling us to draw a reliable picture of the distribution of Tertiary volcanism in Hungary in space and time.

Tertiary magmatism can be broadly classified into two types:

1. an earlier phase of volcanism of calc-alkaline affinity;
2. a generally later (though partly overlapping) phase of alkaline volcanism.

Within the calc-alkaline volcanism, two age groups can be distinguished: an older group, Eocene–Oligocene in age (42–25 Ma), and a younger one, Neogene in age (20–9.5 Ma).

Products of Eocene–Oligocene magmatism are located along and in the vicinity of the Balaton Line, from north Hungary (Bükkszék) to the Zala basin at the SW border of the country.

Miocene volcanic activity started with high volume siliceous calc-alkaline explosive eruptions about 20 Ma ago, and ceased around the Sarmatian/Pannonian boundary (11 Ma). The most intense phase of acidic volcanic activity took place in the Badenian (16.–13.5 Ma). Ignimbrites, reworked tuffs and rare dome-flow complexes are widespread, extending over most of the Tertiary volcanic fields of Hungary. Their source areas are mostly yet unknown.

Acidic and intermediate calc-alkaline volcanic activity frequently occurred simultaneously, they can be alternating, however, andesitic volcanism generally post-dates the acidic one. The oldest andesites (19 Ma) crop out in the Mecsek Mts. but are buried in SW Hungary, while the youngest eruptions (9.5 Ma) are confined to NE Hungary.

K/Ar data proved that the oldest extension related alkaline magmas are about 10 Ma old and erupted just as the calc-alkaline magmatism was waning.

Alkaline volcanism in Hungary is dominated by alkali basalts. K-trachytic (Danube basin, 12.0–10.5 Ma, and Balatonmária, 14.3 Ma) and ultrapotassic rocks (Bár, 2.17 Ma) are represented only by a few occurrences.

Alkaline basalts form significant volcanic fields in the SW part of the Transdanubian Central Range (Balaton Highlands and Bakony Mts., 8.0–2.3 Ma), in the Danube basin (5.5–3.0 Ma), in the Nógrád basin (5.4–2.0 Ma) and in the Danube-Tisza Interfluvium region (Kecel–Kiskunhalas area, 10.4–8.1 Ma). The youngest alkali basaltic volcanism took place about 2 Ma ago, in the Nógrád basin.

References

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