

Cambrian Sosink Formation. Trilobite bearing Late Ordovician Bedinan Formation unconformably overlies older units.

The Derik volcanics are geochemically grouped as basalts, andesites and rhyolites and display a continuous evolutionary trend from transitional to calc-alkaline affinity, which are related to magmatic differentiation. N-MORB normalized multi-element and REE diagrams reveal that Derik volcanics show clear negative anomalies for Nb, Ti and Eu with enrichment in Th, La, Ce and LREE and have similarities with arc-related Late Neoproterozoic lower crustal rocks of the Arabian Plate. The negative Nb and Ti anomalies imply the involvement of a subduction-modified mantle source, whereas the Eu anomaly clearly indicates the fractional crystallization of feldspar minerals. Derik volcanics have LREE >85 times chondrite (85-120), whereas HREE is <25 times chondrite (20-24) times, probably generated outside of the garnet stability field. The $(La/Yb)_N$, $(La/Sm)_N$ and $(Gd/Yb)_N$ ratios vary from 3.29-3.92, 1.91-2.96, 0.85-1.51 for basalts, 3.88-6.53, 2.59-4.14, 1.00-1.53 for andesites and 5.68-5.92, 3.03-4.17, 1.00-1.07 for rhyolites, respectively. The negative Eu anomaly $(Eu/Eu)_N$ in basalts (0.54-0.84), in andesites (0.51-0.72) and in rhyolites (0.57-0.59) probably reflects the result of crystallization of the feldspar minerals from the melts at the source following the partial melting. The LREE/HREE, Nb/Zr and Nb/Y ratios of the studied rocks imply that Derik Volcanics may be differentiated from mafic lower crustal Arabian source. Petrogenetic modelling of Derik volcanics indicate that the initial stages of partial melting of the Arabian LC-source about 8-12 % produced a rhyolitic melts and followed by the partial melting of LC of about 9-18 % and 16-21 % to generate andesitic and basaltic melts.

The volcanics have isotopically lower $^{87}Sr/^{86}Sr$ and $^{143}Nd/^{144}Nd$ values than MORB and can be correlated well with the Early Proterozoic mafic granulites (lower crustal) of Tanzania. Four point whole-rock Rb-Sr isochron data of the volcanics reveal 533+/-25 Ma with an initial $^{87}Sr/^{86}Sr$ value of 0.7057.

Based on the geology, geochemistry and petrogenesis, Derik volcanics may be related to an extension and subsequent rifting in the northern edge of Gondwanan Arabia, which resulted in opening of a new oceanic branch to the north of the Gondwana.

The cadastral survey of Earth scientific values in the protected Hegyes-kő Hill situated in Demjén and questions of its buffer zone in concept of the “Thermal valley” Tourist Development Plan (North Hungary)

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The Hegyes-kő Hill (220 m) is situated in North Hungary, in the Heves County, 7 kilometres far away from Eger, in the northeastern part of Demjén. This territory lies next to the “Thermal valley” (wellness) tourist development area. The territory is a part of the Egri-Bükkalja Foothill Microregion. This area was declared as a Local Nature Conservation Area (as the cultural heritage) by the local government in 1979, because of the hivestones and different anthropogenic niches, which were carved into the rock surface. Lots of geological and geomorphological values can be found in this territory, but these values did not mentioned before. The “Thermal valley” touristic wellness development began in 2007 and new apartments, park places, swimming pools and swimming caves under the surface were built up. The buffer zone and the Earth scientific and cultural values of the study area can be endangered by this building and development activities.

Our research aim is to survey geological and geomorphological fundamentals of the Hegyes-kő Hill, to do the cadastral survey of geological and geomorphological unique values and to reveal anthropogenic factors endangered the buffer zone of the protected area. At the first stage of our investigation we gathered the geological, geomorphological and topographical maps and bibliography of the study area. We have done the research work on the field, where we have surveyed the unique geological and geomorphological values of the Hegyes-kő Hill, we have filled in the form of the Cadastre data sheet of unique landscape

features (Hungarian Standard No. 20381/1999), we have made detailed description of different objects, we have taken photographs of them and gathered sedimentological samples for the laboratory investigation. The geological maps and DDM were created by the Golden Software SURFER 8.0 and the CorelDRAW 12. programs.

The main geological value of the Hegyes-kő Hill is the Miocene Gyulakeszi Rhyolite Tuff Formation: non-welded rhyolite tuff layers and its special geological structure. Somewhere, we can find Pleistocene slope clays at the top of the rhyolite tuff surface. Holocene fluvial sediments build up the alluvium of the Stream Laskó. Non-welded rhyolite tuffs build up the hivesstones too and their environments were investigated in details. We have categorised as a geological value the rhyolite tuff layers appeared in the surface, thin and thick layers of the rhyolite tuffs, its special geological structure and the special (bio)crust appeared on the surface of stones (8 pieces). We have gathered 10 sedimentological samples on the barren rock surfaces or rhyolite tuff surface covered by soils. Therefore these samples were few centimetres thick only; their appearance and genetical development were diversified. The physical parameter and granulometric investigation of the sediment samples can show strongly mechanical and chemical weathering processes. The frost weathering was strong here, but the formation of soil has begun at the top of the hill and environments of cliffs.

In the Hegyes-kő Hill, the most frequently geomorphological values (27 pieces) are periglacial landforms/cryoplanation walls (23%), special cliff forms (15%), derasional valleys (12%) and erosional rills (12%) here. The forms of gelifluction and rock-falls are as different types of mass-movement processes (8%). Water cuts (8%), dissected surface with microvalleys appeared on the rhyolite tuffs (4%) and eroded rhyolite tuff surfaces (4%) are in the hill. Different Pleistocene fluvial terraces (4%) can be investigated in the environs of the hill. After the cadastral survey of the unique natural values, we could find that this territory is rich in geological and geomorphological values and the protected status could be reached into these value categories too.

Next to the study area, significant landscape changes appeared because of the buildings and the development of „Thermal valley”. The original landscape, the buffer zone and natural values are in danger of buildings, human impacts, illegal dumping of waste and trample erosion.

Subduction-related Jurassic gravity deposits in Bükk-Darnó Area, Northeast Hungary

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Jurassic sedimentary sequences of pelagic basin facies and slope-related gravity deposits occur in several places in North Hungary (Bükk Mountains, Darnó area, Rudabánya Hills). The aim of the paper is to characterise the Jurassic formations of the study area with special regard to the redeposited sedimentary rocks in order to get information on the provenance of the clasts, and the mode and time of their redeposition. In the Bükk Mts., the Mónosbél Group contains various redeposited sediments showing an upward coarsening trend. They were deposited in Bathonian in subduction-related basins formed in the course of subduction of the Neotethys Ocean. The lower part of the complex is typified by pelagic carbonates, shales and radiolarites with andesitic volcanoclast intercalations. The higher part is characterised by polymictic olistostromes. Large olistoliths that are predominantly blocks of Bajocian shallow marine limestones (Bükkzsérc Limestone) appear in the upper part of the