during Middle and Late Devonian and were emplaced in the upper crust during Early Carboniferous. Magmas show strong involvement of the Cambrian lower crustal material concerning also the eclogites, and, based on variable relative enrichment of mobile elements (LREEs and LILEs) among the samples, a possible heterogeneous contribution of the subduction component in the system.

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Previous concepts and new data on the structural and magmatic evolution of the Bükk Mts., NE Hungary: first step toward the reconsideration of geodynamic models

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The Bükk Mts. are displaced fragments of the Inner Dinaric nappe system (Schmid et al. 2008). Two major concepts described their structure; one suggests four stratigraphic units as continuous, slightly deformed units (Less et al. 2005), while others considered these units as distinct nappes (Balla 1983, Csontos 1999, 2000). In our contribution we list some new, preliminary observations which may challenge both concepts and will hopefully provide a new one.

The Bükk Complex records the disintegration of the Triassic platform and deposition of Middle(?) Jurassic pelagic radiolarite. It is covered by the Lökvölgy distal turbidites, a slate with siltstone to sandstone intercalations. The overlying Mónosbél sequence contains shale, limestone intercalations, olistostromes and radiolarites. The Szarvaskő Complex is a Jurassic basaltic to gabbroic magmatic suite intruded in or flowed onto fine siliciclastics (Balla 1983). Finally, the Darnó Complex represents a mélange unit, composed of shales and embedded clasts of Triassic-Jurassic sediments and magmatic rocks (Kovács et al. 2011). All units were slightly metamorphosed and folded, the degree of alteration decreases upward. In the nappe-stack concept, the Mónosbél, Szarvaskő and Darnó Complexes are nappes, partly derived from the Neotethyan ophiolites (Csontos 1999, 2000):

- Newly described syn-diagenetic faults, slump folds can be connected to the passive margin setting of the Mónosbél Complex.
- Most, if not all olistolithes can be originated from the passive Adriatic margin, very few could have been scrapped off the Triassic part of the Neotethyan downgoing slab. Limestones are rich in clasts originated from coeval Bajocian-Bathonian carbonate platform.
- The Darnó Complex contains clasts from the overriding upper plate: blocks of Triassic and Jurassic radiolarites as well as Triassic basalts of advanced rifting origin (with peperitic red limestone) and Jurassic basalts similar to those occurring at Szarvaskő (Kiss et al. 2010, 2016, Kovács et al. 2011). We suggest that this is the only ophiolite-related tectono-sedimentary mélange in the Bükk area.
- There is a clear structural boundary at the top of the Lökvölgy Fm. (base Mónosbél Complex); folds are overturned, closed and have regular axial-plane foliation, while folds are open and have layer-parallel foliation, below and above the boundary. In addition, foliation, faults, or boudins form sigmoidal geometry, resembling to S-C foliation/sigma-clasts/faults in duplex; all indicating simple shear. Part of the shearing

with SSE to ESE vergency occurred in sub-horizontal bed position and probably characterise original tectonic emplacement. New fission-track zircon ages (140–134 Ma) would constraint this deformation as earliest Cretaceous.
– The geometry and magma-flow direction of the Szarvaskő Complex may point to a ring dyke-pillow basalt complex. New Sm-Nd dating on garnets from the contact of gabbro and plagiogranite yielded an age of 164.7 ± 1.6 Ma, in agreement with previous K–Ar ages (Árva-Soós et al. 1987; 166 ± 8 Ma on magmatic amphibole and 165 ± 5 Ma on muscovites of the contact hornfels), confirming a Callovian age of the magmatic rocks.
– Whole-rock geochemical data of the magmatites display MORB-like characteristics with subduction-related imprints, therefore previous authors (Harangi et al. 1996, Aigner-Torres & Koller 1999) suggested that the Jurassic magmatism of the Szarvaskő Complex is related to the opening of a back-arc/marginal basin. The differences from a real mid-oceanic ridge setting are also supported by the observed limited submarine hydrothermal processes and the lava-unconsolidated sediment interactions, i.e. the presence of the siliciclastic peperitic facies (Kiss et al. 2016).
– However, there is a strong connection between the Szarvaskő and Bükk Complexes, as the clastics hosting the magmatites have strong affinities to the Bükkian Lökvölgy Fm. and to the Vaskapu Sandstone Fm. It seems to be unrealistic to consider Szarvaskő as part of the upper plate ophiolite nappe system.

Our suggestion is that all complexes of the Bükk Mts. were derived from the same basin, situated on the downgoing slab. Their original position was within the distal continental margin, possibly approaching the trench of the intra-oceanic subduction. Some exotic clasts could be detached during incipient thrusting and redeposited immediately. The Darnó complex, as a mélange, could be linked to the once overlying ophiolite.

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3D structural model of Miocene depositional environment and faults for a future LBr-1 pilot CCS in the Vienna basin

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The LBr-1 is an abandoned oil and gas field Lanžhot – Brodske located at the Czech and Slovak border in the Vienna basin. The Lanžhot block forms a southern part of the Hodonín – Gbely horst in the Czech part of the