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Palaeo-Position and Tectonic Neighborhood of Bükk Mts, N. Hungary

László CSONTOS[1], Emő MÁRTON[2], Bruno TOMLJENOVIĆ[3] and Márton FÓRIÁN-SZABÓ[1]

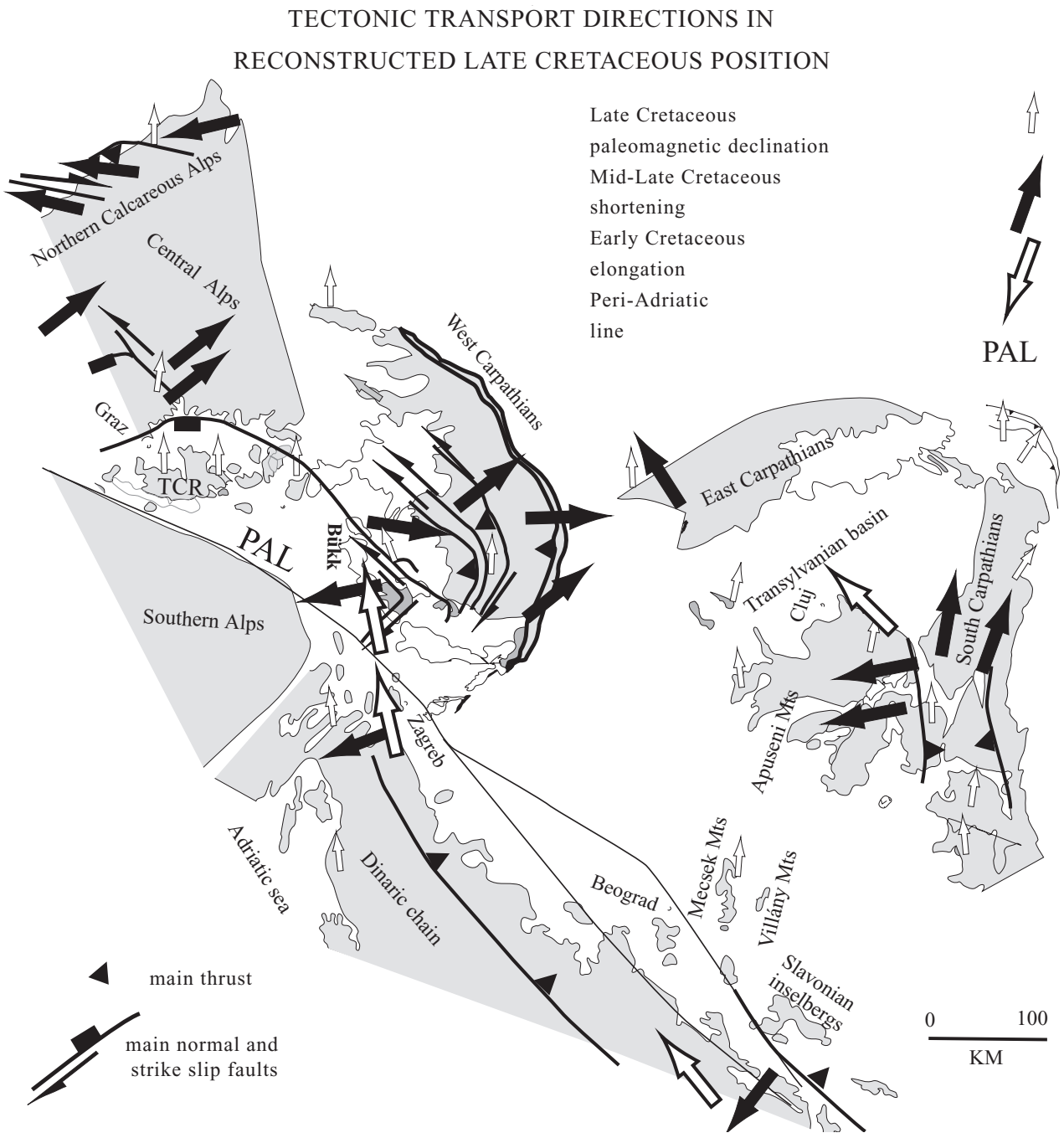
[1] Eötvös University Budapest, Dept of Geology. H-1117 Pázmány P s 1/c Hungary
[2] Eötvös Loránd Geophysical Institute of Hungary, Paleomagnetic Laboratory, Columbus u. 17-23, H-1145, Budapest, Hungary
[3] University of Zagreb, Faculty of Mining, Geology & Petrol. Engineering, Pierottijeva 6, HR-10000 Zagreb, Croatia

The anchimetamorphic, south-vergent Bükk Mts is an "exotic" block in the framework of the generally non-metamorphic, north vergent West Carpathians. Since a long time (Schréter 1943, Balogh 1964) it is considered as a displaced part of the Dinarides. In fact, many formations including Carboniferous turbiditic shales, Upper Permian Bellerophon Limestone, Lower Triassic oolithic limestone, Middle Triassic calkoalkaline magmatism interfingering with pelagic facies and voluminous Upper Jurassic shales/mélange and ophiolitic basalts can find their direct counterparts in the Inner Dinarides (Kázmér and Kovács 1984, Balla 1987, Csontos 1999, 2000, Protić et al. 2000, Filipović et al. 2003). A buried tectonic zone between the Periadriatic-Balaton and the Zagreb-Zemplin (Mid-Hungarian) faults constitutes the natural link between the Bükk exposures and the Inner Dinarides (Wein 1969). This link suggests that the original position of Bükk Mts. can be reconstructed near Zagreb. Major problems arise, however, because the Medvednica Mts have a clear NW vergence, while the Ivanscica Mts is north-vergent. Both show clear stratigraphic-structural similarities to the Bükk Mts units. The continuation of these anchimetamorphic units in north Bosnia and central-east Serbia are clearly SW vergent (Dimitrijević 1997, Csontos et al. submitted).

A growing number of palaeomagnetic measurements suggests that the present disposal of different units in the Carpathian-Dinaric realm is the result of different, often very big rotations in different times (Márton 1990, Márton and Márton 1989, Márton et al. 1999, Csontos et al 2002, Tomljenović et al. 2003). These studies help to outline the positions of different units in the Late Cretaceous. With the help of this reconstruction, all the anchimetamorphic units of different structural directions and vergencies belonging to the once (Late Cretaceous) Internal Dinarides become subparallel and aligned along a single belt.

Dinaric studies (Dimitrijević 1997, Csontos et al., 2003) suggest that these anchimetamorphic units once formed the margin of the Dinaric microplate and are all in a lower plate position with respect to voluminous obducted Jurassic (Triassic) ophiolites. All these units suffered anchimetamorphic transformation at 120 Ma (Árkai et al. 1995; Belak et al. 1995, Milovanović 1984, Milovanović et al. 1995). This age (Hauterivian-Barremian) is interpreted as a cooling age after earliest Cretaceous peak metamorphic conditions (Árkai et al. 1995, Koroknai 2005). Ductile deformation, including the main, originally west-vergent syncleavage folding occurred during peak metamorphic conditions (i.e. latest Jurassic-earliest Cretaceous).

In most anchimetamorphic units a deformation earlier than syn-cleavage folding is observed (Csontos 1999, Tomljenović 2002, Csontos et al2003, Koroknai 2005). This structural event created strong flattening along bedding and a stretching lineaion occasionally with shear markers. The observed shear directions (Fórián-Szabó, this volume, Tomljenović 2002, Csontos et al. submitted) scatter in present positions, but become subparallel to the once Dinaric margin when reconstructed. This shear possibly related to ophiolite emplacement and/or flattening due to Early Cretaceous collision was hence subparallel to the Dinaric margin. The oblique event was followed by a more head-on major shortening, perpendicular to the Dinaric margin. Originally northwards displacement of the ophiolite sheet bears some consequences for the West Carpathian units located more to the north.



■ **Fig. 1.** Tectonic transport directions in reconstructed late cretaceous position.

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Late Jurassic-Early Cretaceous Alpine Deformation Events in the Light of Redeposited Sediments

László CSONTOS, Orsolya SZTANÓ, Tamás POCSAI, Mónika BÁRÁNY, Márton PALOTAI and Edina WETTSTEIN

Geol Dept, ELTE, H-1117 Budapest Pázmány P s 1/c, Hungary

Sedimentologic and mapping work in the Alps (Gawlick et al. 1999, Mandl 2000, Schweigl and Neubauer 1997, Frisch and Gawlick 2003) evidenced an early Alpine, Late Jurassic-Early Cretaceous compressional deformation event affecting the southern Upper Austroalpine realm. There a Triassic-Jurassic passive margin was sheared into a north-vergent (present directions) nappe system inducing large scale slides, slumps and various sediment gravity flows. Late Jurassic and Early Cretaceous formations in Salzkammergut testify these events, however syn-depositional structures are hardly seen because of later strong deformation. Since Alpine units in Hungary were in close proximity of the aforementioned units, any sign of these deformations were thoroughly investigated here as well. Potential exposed areas range from Bükk Mts (N Hungary) to Gerecse and Bakony Mts (Transdanubian Range).

In Bükk Mts there is a widespread but thin olistostrome of micritic and radiolaritic matrix, incorporating different kinds of neritic and pelagic limestone clasts. The age of this formation is pre-Oxfordian and Oxfordian. Major olistoliths of hectometric size are mainly of Triassic Dachstein reef origin. This formation suffered subsequent latest Jurassic-earliest Cretaceous ductile deformation. It can be held as the equivalent of the earliest Salzkammergut redeposited sedimentary material.

In Gerecse Mts Late Jurassic intra-basinal gravitational redeposition is common in several formations. Thin olistostromes of Kimmeridgian age contain reworked pelagic limestones and