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CONODONT COLOUR ALTERATION INDEX (CAI) DATA OF TRIASSIC CARBONATES IN THE ALBANIDES – NEW INSIGHTS ON THE THERMAL OVERPRINT AND FIRST DETECTION OF A POLYPHASE DIAGENETIC/METAMORPHIC OVERPRINT IN THE DIFFERENT TECTONIC UNITS

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For the reconstruction of the geological and geodynamic history of the Albanides the reconstruction of the Triassic carbonate platform is one of the most important requirements. Actually, there is a controversial discussion about the facies belts of the Triassic shelf area in the different units (MECO & ALIAJ 2000, SHALLO & ROBERTSON 2000). However, the facies distributions are the key for the reconstruction of the Jurassic geodynamic history of the Albanides and especially of the Mirdita ophiolite problem.
We dated the Triassic sediments with hemipelagic and pelagic influence within the carbonate platform mainly by conodonts. The Conodont Colour Alteration Index (CAI) was used to determine the diagenetic or metamorphic overprint of the carbonates. We found conodonts nearly in all tectonic units of the Albanides except the Ionian unit in the westernmost area.
The thermal overprint of Triassic carbonates in the Albanides is completely unknown. Also, the ages of shallow water carbonates and intercalated pelagic sequences are insufficiently known. We started our investigations with fossil dating of the Triassic rocks, which, in many cases, form huge slides embedded in a matrix of (Middle to Late) Jurassic radiolarian chert. The CAI values revealed areas with high thermal overprint, mostly in the Triassic carbonates of the central and eastern Albanides. A west-east traverse through all zones of the Albanides shows highly contrastig CAI values and thus a complicated distribution pattern.

Rubiku area: Skuraj and Peshkopi Peripheral Complex (Albania), i.e. in periphery of the Mirdita ophiolite zone - E Bosnian-Durmitor unit (ROBERTSON & SHALLO 2000). The Rubiku complex is the westernmost part of the tectonic melanges east of the Ionian zone (Krasta-Cukali-Budva-Pindos-Olonos zones). In its western vicinity occurs Rubiku flysch (Bosnian flysch in Dinarides - Boeotian flysch in Hellenides?). Different middle to Late Triassic slides occur in a Callovian to Oxfordian cherty matrix sealed by Tithonian calpionella limestones, which were interpretated as flysch-like deposits by SHALLO & ROBERTSON (2000). The slides show low CAI values of 1.0-1.5 near Skuraj (western Krasta-Cukali unit) indicating only moderate diagenetic overprint and of 1.5-2.0, 3.0-4.0 and 5.0-6.0 near Peshkopi indicating hydrothermal influence (eastern Krasta-Cukali unit).

Puka area: The area west of Puka belongs tectonically to the Mirdita Ophiolite zone (Dinaride/Albanian/Pindos ophiolite belt of ROBERTSON & SHALLO 2000, SHALLO & DILEK 2003). Triassic slides occur in a cherty matrix (radiolarites – late Middle to Late Jurassic; GAWLICK, DUMITRICA, MISSONI – unpublished data). These slides show highly contrasting CAI values: 1.5 (Kcira – Early to Middle Triassic: NOPCSA 1929) and 5.0 to 5.5 (Middle and Late Triassic in age – GAWLICK, KRYSTYN, MISSONI – unpublished data). Near Blinisht northeast Rubiko Triassic slides show CAI values of 1.0-1.5

Kukes area: East of Kukes in the Korabi-Pelagonian unit occur CAI values of 2.0-3.0 and 3.0-4.0 nearby the Peripheral Complex. South of Kukes, the Late Triassic Hallstatt limestones in the windows near Fshati show CAI values of 1.5.

Fierza area (Porav): Mirdita Ophiolite zone. The very complicated Fierza area shows different CAI values in different localities. In the Porav section we determined CAI values of 1.5 from slides in the ophiolitic Melange and of 3.0 (-4.0) in mostly Middle to Late Triassic pelagic Hallstatt type sediments directly on top of ophiolites (eastern belt ophiolite, GAWLICK, KRYSTYN, MISSONI – unpublished data). It can be shown that the sedimentary succession consists of two different, probably tectonic slices.

Librazhdi area: Mirdita Ophiolite zone. East of Librazhdi Late Triassic breccia components in a jurassic cherty matrix on basis of the eastern belt ophiolite show CAI values of 2.0.

Langa: Peripheral Complex (eastern Krasta-Cukali unit; Albania), i.e. in periphery of Mirdita ophiolite zone - E Bosnian-Durmitor unit. Middle Triassic carbonates in the Langa area show low CAI values of 1.0-1.5.

Peladhi area: Peripheral Complex (Albania), i.e. in periphery of Mirdita ophiolite zone - E Bosnian-Durmitor unit. In the Peladhi area, which belongs tectonically to the Mirdita zone, we found CAI values in Middle and Late Triassic pelagic carbonates of up to 5.0, in some places even 5.5-6.0.

Ohrid Lake (Lini): Peripheral Complex (Albania), i.e. in periphery of Mirdita ophiolite zone - E Bosnian-Durmitor unit. Middle to Late Triassic carbonates show very high CAI values of up to 6.0. Partly we can determine hydrothermal influence. This implies thermal overprint of the pelagic and shallow water carbonates up to 400 °C.

We also dated the matrix of the slides by radiolarians as Middle to Late Jurassic (GAWLICK, DUMITRICA, MISSONI – unpublished data). As shown by the good preservation of the radiolarians, the thermal overpint of the matrix remained low. This leads to the important conclusion that the thermal overprint of the Triassic carbonates predates the emplacement of the slides into the radiolarian cherts and is therefore transported.
We also found a trend of decreasing thermal overprint from east to west, which overprinted the transported slides. This thermal overprint is younger than early nappe stacking but older as nappe reactivation and final emplacement in probably Early Tertiary times, because we partly found inverted thermal overprint in the nappe stack.
These first results show that the Albanides have a polyphase thermal history, not exactly dated at the moment. Our data show also that the previous tectonic interpretations have to be modified and that a great number of age and termperature data will be needed.

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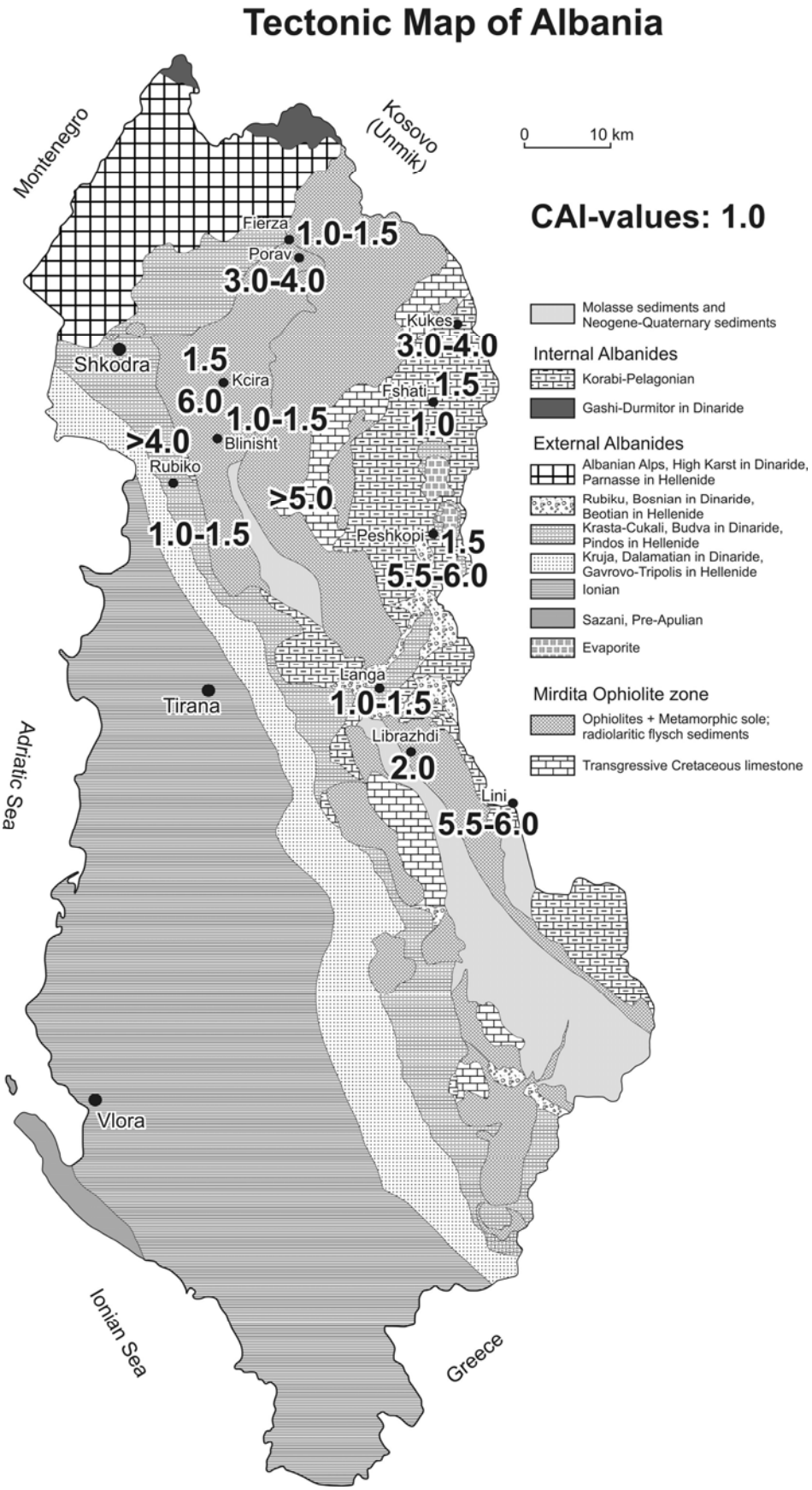

Fig.: Tectonic Map of Albania (based on Geological Map of Albania). CAI values and sample locations.