Clasts of cement-rich Middle Triassic reefal limestones from Late Jurassic mass-flows of the Mirdita Zone of Albania (Kurbnesh area) and their palaeogeographical significance: Component analysis of mass-flow deposits as a tool to solve paleogeographic questions and to reconstruct the early geodynamic history of the Albanides

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The Mirdita Zone of the internal Albanides comprises Jurassic ophiolites, radiolaritic wild-flysch and Late Jurassic to Early Cretaceous shallow-water limestones. Autochthonous Triassic shallow-water carbonates are unknown. Only in the External Albanides and the Korabi-Pelagonian zone of the Internal Albanides Middle and Late Triassic shallow-water limestones occur. The main part of the Internal Albanides are characterized by late Triassic sediments deposited in a restricted lagoon: Carnian evapo-rites and Carnian to ?Rhaetian dolomites (Hauptdolomite s. l.). Only in the Albanian Alps Middle Triassic shallow water carbonates occur. These Middle Triassic carbonates are poorly known both in stratigraphy and microfacies. The Korabi-Pelagonian zone of the Internal Albanides are characterized by Early to Late Triassic sequences of siliciclastics and carbonates. Detailed microfacies and stratigraphic investigations are missing, obviously late Middle Triassic to early Late Triassic and Late Triassic shallow water carbonates exist, partly in reefal facies.
From the area of Kurbnesh slope deposits of an eroded Late Jurassic shallow-water carbonate platform followed by flyschoid-molasse sediments on top of Mirdita ophiolites were recently described. On top of these Late Jurassic slope deposits a more than 100 m thick flyschoid-molasse succession of Late Tithonian to Valanginian turbidites and mass-flows occur, which should be part of the “ophiolitic mélange” of older authors.
Detailed clast analysis of these series beneath the prograding Early Cretaceous Munella platform evidenced Middle Triassic (Ladinian) shallow-water limestones rich in cement crusts (up to > 50 %), microbial crusts and microencruster such as “Tubiphytes” or *Plexoramea cerebriformis* Mello (Ladinian to Norian). Within this sedimentary sequence, in which the clasts of Middle Triassic limestones are dominating, Late Jurassic to Early Cretaceous limestone clasts were not observed.
This characteristic facies is well known from the Schlern Formation of the Southern Alps (Dolomites, N-Italy) forming well-known occurrences such as the Latemar, Sella or

Marmolada. Recently, this peculiar facies was also detected in the Karavank Mountains/ Koschuta unit at the Mount Loibler Baba near the Austrian-Slowenian border. Cement-rich boundstones characterize a small zone of an well-agitated platform margin approached as „Algen-Zement-Riff“ or more generally as “cement-supported framework”. In this case the terminus algae refers to the microencruster incertae sedis „Tubiphytes“ and crustose compositions showing affinities to Paleozoic phylloid algae (e.g. genus *Archaeolitho - porella*). The synsedimentary formed cements occur either as crusts within boundstones or fixes individual boundstone clasts.

So this characteristic reef type is in the moment only known from the Southern Alps, the Karavank Mountains and the Mirdita Zone. But it can be expected as a widespread, nearly uninvestigated facies typically for the ramp/platform margins of the Steinalm/ Wetterstein/Schlern carbonate platform of the late Middle to early Late Triassic European continental margin. So this facies may form a long and coherent belt in this time, striking from the Eastern Alps to the External Albanides. After the early emplacement of the Mirdita ophiolite nappes in Middle Jurassic times nearly to its present position adjacent to the External Albanides the zone of the Internal Albanides, or a facies equivalent became uplifted by out-of-sequence thrusting or exhumation and start to erode in Tithonian to Berriasian times.

The analysis of these Tithonian to Berriasian mass-flow deposits and the finding of Triassic cement crust reefs in Kurbnesh area show clearly, that the paleogeography and geodynamic history of the Albanides is absolutely not understood. Only a detailed component analysis of the different mass-flow deposits (Middle Jurassic to Early Cretaceous) in the Albanides, especially in the Mirdita Zone can solve paleogeographic questions and allow to reconstruct the early geodynamic history of the Albanides. The reconstruction of the Jurassic to Cretaceous geodynamic history of the Albanides is essentially for the interpretation of all tectonic zones striking from Slovenia to Greece and build the Internal Dinarids, Internal Albanids and Internal Hellenids.