

Carbonate platform growth in a convergent tectonic regime: the Munella carbonate platform in the central Mirdita Zone (Albania)

Hans-Jürgen Gawlick¹, Felix Schlagintweit¹, Richard Lein², Sigrid Missoni¹, Tonin Deda³ & Lirim Hoxha³

1 University of Leoben, Department for Applied Geosciences and Geophysics:

Chair of Prospection and Applied Sedimentology, Peter-Tunner-Str. 5, A-8700 Leoben

2 University of Vienna, Centre of Earth Sciences, Althanstr. 14, A-1090 Vienna

3 Geological Survey of Albania, Tirana, Albania

The Late Jurassic to Early Cretaceous Munella platform in central Albania represents the first large scaled shallow water carbonate platform in the area of ophiolite nappes called Mirdita zone in the Albanides. This carbonate platform grew on top of ophiolitic nappes and completely sealed the Middle to early Late Jurassic tectonic movements in the Mirdita zone. Whereas the older shallow water carbonates (Kimmeridgian?, Tithonian) on top of these ophiolitic nappes were eroded, the Cretaceous Munella platform covers large areas in central Albania. Only few information exist from the upper part of the sedimentary sequence of the Early Cretaceous platform deposits of the Munella Mountains as type locality located in the north-eastern part of Albania. These authors assume a Barremian to Aptian age of the Munella carbonate platform. Hence, the nappe emplacement of the Mirdita ophiolites was dated as older as the onset of the shallow water carbonates.

On top of ophiolitic rocks a more than 300 meters thick succession of Bathonian to Oxfordian radiolaritic (wild)flysch deposits follow, containing - besides ophiolitic material - a large amount of Triassic limestone clasts. This radiolaritic flysch was overlain by different reef slope deposits dated in the Kurbnesh area as Kimmeridgian? to Tithonian by shallow water organism (Kurbnesh formation). They derive from a shallow water carbonate platform on top of the ophiolitic Mirdita nappe totally eroded due to tectonic movements in lowermost Cretaceous times. In Munella area another type of mass-flow deposit occurs on top of the radiolaritic flysch with a lot of micrite clasts and ophiolitic material, not exact dated at the moment, but may be sedimented in Kimmeridgian? to Tithonian times as facies equivalent of the Kurbnesh formation. The overlying sequences contain shallow water carbonate clasts indicating the onset and progradation of an Early Cretaceous shallow water carbonate platform.

The Berriasian to Early Valanginian age of the mass-flows of the flyschoid-molasse below the Valangian platform slices, which contain beside ophiolitic material a large number of limestone clasts mainly of reefal platform margin facies. This can be manifested by the occurrence of *Protopeneroplis ultragranulata* (Gorbachik), *Pseudo-cyclammina lituus* (Yokoyama), *Andersenolina campanella* (Arnaud-Vanneau et al.) and *Macroporella?*

pratuloni Dragastan. The youngest basin sediments containing calpionellids can be attributed to the Late Berriasian (*oblonga* zone). At the western side of the Munella platform the flyschoid-molasse covers the ophiolitic mélangé with several superimposed slices of (Late) Berriasian-Valanginian shallow water lime-stones. They comprise platform margin deposits, sometimes brecciated, with corals and stromatoporoids (including taxa are so far reported from Late Jurassic strata, e.g. *Tubuliella fluegeli* Turnšek, *Tubuliella rotunda* Turnšek) interfingering with back-reef (e.g., *Bacinella* bindstones) and occasional lagoonal deposits of reduced thicknesses. Within these lagoonal intercalations, the benthic foraminifera *Vercorsella tenuis* (Velic and Gusic) and *Montsalevia salevensis* Zaninetti *et al.* as Valanginian marker species occur. The existence of Valanginian shallow water lime-stones was unknown so far since the flyschoid-molasse-type facies was attributed to both the Berriasian and also the whole Valanginian overlying the whole Mirdita area. The sandy flyschoid-molasse facies with platform-derived debris existed in more basinwards parts showing a complex basin and rise topography in the Mirdita area in the Early Cretaceous. The superimposed slices of Valanginian platform carbonates are obviously missing at the eastern part of the Munella platform suggesting thrusting from east to west. There are indications of emersion (microcarst), but the exact dating of the resulting sedimentary gap or “lost sequence is still unknown. In the former Yugoslavian territory this discontinuity was seen as a consequence of the “main Cimmerian events”. In other parts of the Mirdita zone, the occurrence of *Recteodictyoconus giganteus* Schroeder and *Mesorbitolina texana* (Roemer) within mass-flows documents, that the shallow water evolution prevailed until the Late Aptian.

By our results we can reconstruct a complex basin and rise topography due to active tectonic shortening from Bathonian to Aptian times. The carbonate platform growth started in Kimmeridgian?-Tithonian and prevailed until the Aptian with existing interruptions in platform growth and erosion of shallow water carbonates. Within these time intervals we find active nappe movements and flyschoid-molasse sediments at different places pointing to a very complex evolution of the Munella carbonate platform complex in the Mirdita zone. For a more precise reconstruction of the history of the Munella carbonate platform further detailed investigations are necessary to reconstruct the evolution of this carbonate platform in a long lasting convergent regime as seen in the central Albanides.