

The Middle to Late Jurassic sedimentary succession of the Knallalm-Neualm area north of Russbach (northern Dachstein Block, central Northern Calcareous Alps)

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According to the official geological map of Austria (ÖK 95 St. Wolfgang, Plöchingner 1982) the surface geology of the investigated Knallalm-Neualm area north of Russbach is strongly dominated by Dachstein limestone with only minor occurrences of Early to Middle Jurassic limestones and breccias, Late Jurassic siliceous rocks of the Tauglboden Formation and clastic rocks of the northernmost embayment of the Gosau type-locality basin. Some important differences in comparison to the map could be proven, most important of which is a prominent appearance of Late Jurassic limestones of the Plassen carbonate platform. These shallow water carbonate rocks, stretching over an area of about 300 x 1000 m, were previously mapped as Dachstein limestone on top of diversely-aged Jurassic strata.

The widely distributed Rhaetian Dachstein limestone of the Knallalm-Neualm area lacks a Liassic cover sequence and is instead directly overlain by Middle Jurassic *Bositra* filament and protoglobigerina limestones of the Klaus Formation often containing foraminifers, crinoids, little ammonites and nodosarides. Together with the low thickness of generally less than 10 m hardgrounds indicate strong condensation. At the top of the red limestones ribbons and layers of red chert bridge to the overlying Ruhpolding Radiolarite Group which starts with well-bedded red radiolaritic limestones. These are at minimum 2 m thick south of the Hohe Knallalm but reach thicknesses as large as 10 m at the second main outcrop locality northwest of the Hohe Knallalm where this dominantly red sequence is more marly in character. The higher part of the Ruhpolding Radiolarite Group is made up of mainly ochre-coloured radiolaritic limestones and marls about 30 to 40 m thick. Overall, three breccia horizons exist, the exact spatial relation to each other is not sure due to the poor outcrop conditions, faulting and the preponderance of only partial profiles. South of the Hohe Knallalm there is the oldest, less than 1 m thick breccia layer about 10 m above the basis of the ochre-coloured radiolarites with components almost exclusively of Klaus Formation. Two breccia horizons exist northwest of the Hohe Knallalm apparently both younger in age than the one in the south. The lower one of these breccias in the upper part the radiolaritic succession is about 1,5 m thick. The generally smaller than 1 cm sized clasts indicate deeper erosion of a "kalkvorlpin" facies source region. Stratigraphic units recognised are ?Norian lagoonal dolomites and hypersaline clasts (Dachstein dolomite and/or Hauptdolomite), lagoonal Dachstein limestone of Norian to Rhaetian age, Rhaetian oolitic limestones, pelagic grey marly limestones (?Enzesfeld Formation, Liassic), crinoid limestones

of the Hierlatz type (Liassic), *Bositra* filament limestones of the Klaus Formation (Dogger) and radiolaritic limestones of the Ruhpolding Radiolarite Group. On the one hand, the component spectrum shows some similarities to the one reported from the Tauglboden Formation. On the other hand, however, there is a conspicuous lack of clasts of the Adnet and Kössen formations which are typical for the Tauglboden Formation, suggesting some differences in the source region. From the base to the level of this middle breccia occurrence, excellently preserved radiolarian fauna have been separated from the background sediments, proving a Callovian to ?Middle Oxfordian age at least for these at least lower three quarters of the radiolaritic succession. If the upper breccia horizon constitutes the very top of the Ruhpolding Radiolarite Group or overlies the latter is unclear as it only exists in forms of blocks and no radiolaritic matrix has been proven at this level yet. Here, the components are larger in size (up to some decimetres) and consist particularly of inner lagoonal dolomitic tidal flat deposits of assumably Norian age and radiolaritic spiculites most probable of the Dürrnberg Formation with *Gorgansium* sp. H evidencing a Liassic age. These slide blocks are, at least in case of the Liassic clasts, exotic in respect to both the local Knallalm-Neualm substratum and the two lower breccia horizons' component spectra, and thus indicate a change regarding the source region and re-deposition processes. Elsewhere, Rhaetian Dachstein limestone occurs at the same stratigraphic level on top of the radiolarites; as yet the number, distribution and geometry of these apparently decametric occurrences could not be clarified and even their nature – synsedimentary slides or the result of tectonic faulting – is not known, but sliding seems more likely. However, it is clear that Dachstein limestone takes only a very small portion compared to the lithologically similar Plassen limestone panel generally overlying the Ruhpolding Radiolarite Group.

The bright, mostly massive limestones of the Plassen Formation are about 150 to 200 m thick and represent depositions of a back-reef to open and closed lagoon depositional environment. The occurrences of *Anchispirocyclina lusitanica* (Egger) and *Neoteutloporella socialis* Praturlon evidence a Tithonian age. This Tithonian succession strongly resembles the contemporaneous sequence at the type locality of the Plassen formation about 5 km to the south. However, it lacks the underlying Kimmeridgian slope and platform margin succession with the shallowing upward sequence gradually passing over from the radiolaritic basin sedimentation. In addition, the very thick, mega-slide rich radiolaritic basin sequence of the Plassen area is fundamentally different. All in all, only on the first view the Late Jurassic sequence of the Knallalm-Neualm seems to be complete and continuous. More accurate investigations show that there is a large gap within the succession with apparently both the higher Ruhpolding Radiolarite Group and the lower Plassen Formation missing. Instead, in this level there is a slide block horizon partly with exotic components. The whole situation argues against an in situ deposition of this newly discovered Plassen Formation occurrence and instead for its interpretation as a mega-slide in the framework mass movements taking place soonest in Late Kimmeridgian times.

Plöching, B. (1982): Geologische Karte der Republik Österreich 1 : 50.000: Blatt 95 St. Wolfgang im Salzkammergut mit Erläuterungen. – 1-74, Geol. B.-A., Wien.