

The Late Jurassic radiolaritic breccia of the Katrin-Nussensee area (northern Dachstein Block): Radiolarian dating, component analysis and paleogeographic implications

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At the northern margin of the Dachstein Block between the Katrin-Sonntagkarkogel mountain ridge and Lake Nussensee an as yet undescribed Jurassic succession inclusive a radiolaritic breccia sequence has been met in an area which was actually supposed to be made up of Dachstein limestone (Plöching 1982). Samples of the radiolaritic strata gained in a first field campaign were scrutinised mainly on their radiolarian fauna and the nature and origin of the breccia components. These information allowed to paleogeographically allocate the area with respect to the Middle to Late Jurassic basin configuration of the Northern Calcareous Alps.

Within the intensely folded and faulted succession north of Mount Katrin a complete, strongly condensed Early to Middle Jurassic section about 10 m thick occurs above lagoonal Dachstein limestone which predominates the surface geology of the area. The Jurassic strata on top of the oolitic uppermost Rhaetian Dachstein are mainly represented by Adnet facies red to ochre grey limestones often with nodular habit and sometimes with conspicuous manganese nodule horizons. Only 2 m above the base of the radiolaritic succession the first breccia horizon occurs. Concerning the rocks of the Ruhpolding Radiolarite Group, there are differences between the eastern and the western part of the area investigated: East of the Schöffaubach valley the radiolaric matrix is generally reddish in colour, whereas in the west it turns to ochre colours above a basal red interval. In comparison to the western area, in the east the breccias are more abundant, their deposition started earlier within the radiolaritic sequence and the debris flows are generally coarser-grained, contain less matrix and show greater thickness with single breccia bodies up to 10 m. These differences are thought to be the result of some kilometres of sinistral offset along branches of the Königssee-Lammertal-Traunsee fault system dissecting the area of investigation: The strata in the eastern half, originally deposited further to the south, are today met at the same latitude like the originally more northerly deposited strata in the west, supporting an original fining northward trend.

Thin sections were analysed in order to determine the stratigraphic affiliations of the breccia components by means of their microfacies characteristics. The clasts show a large variety in lithology and age, however, originate all from the same substratum of 'kalkvorlpin' Tirolic affinity. The components have a primary stratigraphic age of Norian to Callovian/Oxfordian and could be assigned to the following stratigraphic units: Norian and Rhaetian lagoonal Dachstein limestone, Norian/Rhaethian Kössen formation, limestones of the Kendlbach, Scheibelberg,

Adnet and Klaus formations and siliceous rocks of the Ruhpolding Radiolarite Group. In addition, in the higher part of the section fine-grained detritus of the Late Jurassic Plassen carbonate platform with *Carpathiella* cf. *plassenensis* could be proven

Samples of the fine-grained part of the radiolaritic succession (breccia matrix, radiolarites, siliceous limestones and marls) were solved for radiolarians. According to the Unitary Association Zonation for Tethyan radiolarians (Baumgartner et al. 1995) the rocks must be assigned to U.A.-Zone 8 corresponding to the *Protunuma lanosus* to *Willriedellum dierschei*-Subzone within the *Zhamoidellum ovum*-Zone of Suzuki & Gawlick (2003). This suggests a Middle Callovian to Early or, considering the age revisions of Beccaro (2004), Middle Oxfordian age. An age of the breccia succession rather at the upper limit of the timeframe given by the radiolarian biostratigraphy is suggested by the occurrence of Plassen limestone components since the main phase of Plassen platform growth did not start earlier than latest Oxfordian to earliest Kimmeridgian.

The age and the lithostratigraphic suite of the breccia components confirm the succession to belong to the Tauglboden Formation. The absence of components of the Triassic Tethys rim, slope and basin margin sediments excludes an affiliation of the breccias to the more southerly situated Lammer Basin with its Strubberg Formation basin infill. The sediments of the even more southerly Sillenkopf Basin are generally younger in age and show a different component spectrum. The high volume of breccias and the size and spectrum of components indicate an original depositional position in the southern, proximal part of the Tauglboden Basin close to Trattberg Rise as the main source region. The stratigraphic results, on the one hand, prove the Dachstein Block as part of the Tirolic mega-unit and exclude a far transported "Upper Juvavic" Dachstein nappe originating from the southern margin of the Northern Calcareous Alps. On the other hand, they claim the need to subdivide the Dachstein Block into a northern Lower Tirolic part north of the Trattberg Rise and an Upper Tirolic part south of the latter. The position of the Trattberg Rise within the Dachstein Block is regarded to correspond to the deeply eroded Weissenbach valley area as the Middle-Late Jurassic succession of the Knallalm-Neualm area to its south cannot be accounted to the Tauglboden Basin (Auer et al., this volume).

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