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Tectonic, eustatic and climatic control on the Dachstein platform development in the Transdanubian Range, Hungary

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The Transdanubian Range unit is made up predominantly of Triassic formations representing a large segment of the Neotethys passive margin that was located between the South Alpine and Upper Austroalpine realms (Haas et al, 1995, Gawlick, 2000). Since this unit was not affected by intense Alpine deformations the facies relationships reflect the original paleogeographic setting and there is a good potential for the analysis of the controlling factors of the facies development.

In the Transdanubian Range the Variscan orogen was followed by intense denudation and continental sediment deposition. Gradual inundation of the region commenced in the Late Permian and continued in the Early Triassic leading to establishment of a wide ramp. Extensional tectonics in connection with the Neotethys rifting resulted in disintegration of the ramp and development of isolated platforms and basins during the Middle Anisian. Upfilling of most of the basins in the early Late Carnian as a result of the climate controlled intense terrigenous influx gave rise to development of a large Dachstein-type platform in the latest Carnian (Haas & Budai, 1995). The platform evolution was controlled by the joint effects of tectonic, eustatic and climatic factors. The main stages of the platform development are as follows:

1. After a sea-level drop in the Late Tuvalian a uniform platform characterised by an extremely levelled topography established in the predominant part of the TR. Here the high-frequency sea-level oscillation led to deposition of peritidal-lagoonal Lofer-cyclic successions which were subject to pervasive dolomitization under the semi-arid climate. In contrast in the NE part of the TR, representing the outer belt of the shelf the new extensional basins came into being in the Carnian which separated smaller platforms (Haas 2002).
2. In the middle part of the Norian a gradual change took place in the dolomitization pattern: the pervasive dolomitization was changed to partial and selective dolomitization. Appearance of paleokarstic features accompanied by humid paleosol horizons also suggests a gradual climatic change.
3. In the early Late Norian in connection with the incipient opening of the Penninic Ocean extensional basins began to open in the SW part of the TR. It is indicated by appearance of basinal dolomites above the cyclic peritidal-lagoonal facies (Haas, 2002). Coevally the trend of increasing humidity continued that is reflected in the cessation of the early dolomitisation on the isolated platform between the still existing intraplatform basins in the outer shelf zone and the newly opened backplatform basin (Kössen Basin).
4. In the latest Norian in the backplatform basin the carbonate deposition was changed by accumulation of fine siliciclastics, suggesting humid climatic conditions. Eastward extension of the Kössen Basin during the Early Rhaetian was the result of a relative sea-level rise that was followed by a significant platform progradation during the latest Rhaetian.
5. Joint effect of the enhanced subsidence and the end of Triassic ecologic perturbation led to drowning of the Dachstein platform at the Triassic/Jurassic boundary in the NE part of the TR whereas it was taken place only at the end of the Hettangian in the SW part of the unit (Vörös & Galácz, 1998).

References

Gawlick H.–J. 2000a: Paläogeographie der Ober–Trias Karbonatplattform in den Nördlichen Kalkalpen. Mitt. Ges. Geol. Bergbaustud. Österr. 44, 45–95.

Haas J. 2002: Origin and evolution of Late Triassic backplatform and intraplatform basins in the Transdanubian Range, Hungary. Geol. Carpathica, 53, 159-178.

Haas J. & Budai T. 1995: Upper Permian–Triassic facies zones in the Transdanubian Range. Riv. Ital. Paleont. Strat. 101, 249–266.

Haas J., Kovács S., Krystyn L. & Lein R. 1995: Significance of Late Permian–Triassic facies zones in terrane

reconstructions in the Alpine–North Pannonian domain. Tectonophysics 242, 19–40.