Upper Jurassic – Lower Cretaceous platform to basin transition of the Northern Calcareous Alps

Alois FENNINGER[1] and Michael W. RASSER[2]

[1]Karl-Franzens-Universität Graz, Institut für Erdwissenschaften, Bereich Geologie und Paläontologie, Heinrichstrasse 26, A-8010 Graz; e-mail: alois.fenninger@uni-graz.at
[2]Staatliches Museum für Naturkunde Stuttgart, Rostenstein 1, D-70191 Stuttgart; e-mail: michael.rasser@paleoweb.net

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Tectonic events in the Upper Triassic caused the break of carbonate platforms in the Northern Calcareous Alps (NCA). Drawning and synsedimentary faulting stipulated a highly structured seaflor topography with sedimentation of crinoidal limestones, cherty limestones as well as cephalopod limestones on top of the Triassic platforms. This mainly pelagic development lasted until the Oxfordian with deposition of radiolarites and siliceous limestones.

The Upper Jurassic to Lower Cretaceous development is linked to the opening of the Northern Atlantic and the Penninic Ocean and led to the break up of Pangea and the Austroalpine units. They became independent from the European Plate and are considered as microplate north of the Apulian Plate.

Basin sediments of the central part of the NCA are represented by radiolarites and cherty limestones overlain by Tithonian to Valangian micritic sediments with intercalations of allodapic limestones. Carbonate breccias together with variagated nodular limestones and periplatform ooze are interpreted as slope deposits.

Platform environments are represented by large carbonate mud areas with local patch reefs. Other reefal areas of the platform are dominated by "stromatoporids", "chaetedids", scleractinians and microincrusters binding reef rubble. Inner platform environments are dominated by "stromatoporids" while corals are subordinate. In open platform environments secondary framework builders can bind reef rubble.

The Jurassic Alpine reefs reflect trends to coral adapted oligotrophic high-energy conditions, representing ancestors of modern reefs.

Beside the typical reef guild organisms, gastropods (nerineids) and patches of dasycladales are typical for low energy environments.

Depositional sequences and ammonite fossilization on deep carbonate platform environments (Upper Oxfordian, Iberian Range, Spain)

Sixto R. FERNÁNDEZ-LÓPEZ[1] and Guillermo MELÉNDEZ[2]

[1]Departamento y UEI Paleontología, Facultad Ciencias Geológicas e Instituto Geología Económica, (CSIC-UCM), 28040 Madrid, Spain; e-mail: sixto@geo.ucm.es
[2]Departamento de Geología (Paleontología), Universidad de Zaragoza, 50009 Zaragoza, Spain; e-mail: gmelende@posta.unizar.es

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The uppermost deposits of the Yatova Formation in the Ricla area represent a condensed section, 1.5 m thick, developed during the Semimammatum and Berrense subchronozones. This interval is composed

of grey-reddish wackestone to packstone and boundstone beds alternating with marly intervals, bearing common sponges, ammonites and bioturbation textures. Terebratulid and rhynchonellid brachiopods, belemnites, bivalves, gastropods, serpulids, bryozoans, crinoids and echinoids are very scarce. Small sponge mud mounds, some few metres wide and less than 50 cm high, are locally developed. Limestone beds, 10 to 40 cm thick, show sharp base, but gradual size-increase or inverse grading of fossils and gradational upper boundary. Marly intervals, under 40 cm thick, display planar fabric, being normal grading of fossils more common than inverse grading. Hardground surfaces, ferruginous crusts and glauconite grains are common on the limestone beds. In contrast, hardground surfaces are not developed within marly intervals, although reworked concretions and remobilization surfaces are common, often capping the underlying argillaceous sediments. Parasequences show a less distinct development than in underlying intervals. Thickening and coarsening upwards sequences of metric thickness are common. Thinning and fining upwards sequences are scarce, generally developed between the last sponge mounds and associated with the thickest intervals of condensed deposits.

This condensed interval is interpreted as formed in an open marine, moderately deep carbonate platform, below effective wave base, showing generally low-energy conditions with extremely low rates of carbonate and terrigenous sedimentation. Marly deposits represent background sedimentation, with very low rates of sediment accumulation, which may be due to sedimentary starving as well as to winnowing action on the seafloor. In contrast, limestone beds correspond to event sedimentation, with relatively high rates of sediment accumulation, probably distal tempestites. Lasting episodes of background sedimentation give rise to clay deposits showing no evidence of basal discontinuity, whereas brief events of turbulence lead to carbonate deposits with sharp base. The low diversity of the benthic fauna, scarce development of sponge bioherms and microbial crusts, as well as ammonite populations inhabiting the platform are all palaeobiological criteria confirming these deep and distal palaeoenvironments. Taphonomic features of ammonite assemblages indicative of sedimentary starving are the occurrence of: 1 – high concentrations of reelaborated ammonites showing very low values of taphonomic condensation; 2 – taphonic populations of type-2; 3 – predominant internal moulds of phragmocones completely filled with homogeneous sediment up to the innermost whorls; and 4 – reworked fossils bearing no signs of abrasion, bioerosion or dense encrusting.

These condensed deposits characterize the last phase of a deepening half-cycle, attaining the maximum deepening environments during Upper Jurassic, within a 3rd order deepening/shallowing cycle developed in the Iberian platform system.

Aalenian-Bajocian iron-coated grains: evolutionary stages, sequence distribution and genetic significance (Iberian Basin, Spain)

Alejandra GARCÍA-FRANK[1], Soledad URETA[1] and Ramón MAS[2]

[1]Departamento y UEI de Paleontología, Facultad C. C. Geológicas e Instituto de Geología Económica, (CSIC-UCM), 28040 Madrid, Spain; e-mail: agfrank@geo.ucm.es, solureta@geo.ucm.es
[2]Departamento y UEI de Estratigrafía, Facultad C. C. Geológicas e Instituto de Geología Económica, (CSIC-UCM), 28040 Madrid, Spain; e-mail: ramonmas@geo.ucm.es

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The study area is situated in the northwestern extreme of the Iberian Range (northern Spain). Some sections ranging from uppermost Toarcian to Bajocian have been studied for the analysis of the iron rich particles. Petránek & Van Houten (1997) documented about 550 well-known Phanerozoic ooidal