LOWER CRETACEOUS MASS OCCURRENCES OF AMMONOIDS – IMPLICATIONS ON TAPHONOMY AND STRATIGRAPHY (UPPERMOST VALANGINIAN; NAPPE; NORTHERN CALCAREOUS ALPS; UPPER AUSTRIA)

Alexander **LUKENEDER**

Lower Cretaceous pelagic sediments are known to form a major element of the Staufen-Höllengebirgs Nappe. Valanginian to Hauterivian cephalopod-bearing deposits are recorded in two different facies, the Schrambach and the Rossfeld formations. Upper Valanginian sediments of the Rossfeld Formation are mainly composed of turbiditic sandstone intercalations, whereas the Rossfeld Formation comprises turbiditic marls and sandstones (Immel 1987).The stratigraphy of the Lower Cretaceous sediments in the investigated area is based on ammonoids.

The Upper Valanginian succession of southernmost part of Upper Austria was deposited in an unstable shelf setting characterized by thick sandstone units that reflect transgressive histories combined by tectonic events (see Faupl, 1979). The terrigenous, proximal, deep-water turbiditic Rossfeld Formation of the Staufen-Höllengebirgs Nappe represents a synorogenic development (see also Vašíček & Faupl 1998; Lukeneder 2004).

The locality is situated in the southernmost part of the Tirolic Unit which underlays and/or neighbours in this region a small 'Hallstädter Scholle'. The Tirolic Unit is a part the 'Traunalpen Scholle' which at this region displays the westernmost part of the Staufen-Höllengebirgs Nappe.

Lower Cretaceous sediments are represented at the area around the Kolowratshöhe section by two formations, the Rossfeld Formation (approx. 120 m, Upper Valanginian) and the Schrambach Formation (approx. 40 m, Hauterivian).

The macro-invertebrate fauna consists of ammonoids, aptychi, brachiopods (*Triangope*). The only benthic macrofossils observed in the ammonoid beds are brachiopods. Macro-vertebrates are only represented by shark-tooth (*Sphenodus*). Brachyphyllum is the only determinable remnant of plants. The abundant and generally well-preserved cephalopods are dominated by olcostephanids. The fairly fossiliferous part of the section shows remarkably abundant olcostephanids.

The association indicates that the cephalopod-bearing beds of the Rossfeld Formation belong to the *Criosarasinella furcillata* ammonoid Zone (*Criosarasinella furcillata* Subzone) of the latest Late Valanginian (according to the results of the Lyon meeting of the Lower Cretaceous Ammonite Working Group of the IUGS; 'Kilian Group'; HOEDEMAEKER *et al.* 2003).

The following ammonoids were observed:, *Phylloceras serum, Phyllopachyceras winkleri, Lytoceras subfimbriatum*, *Lytoceras sutile*, *Leptotetragonites* sp., *Protetragonites*, *Haploceras* (*Neolissoceras*) *grasianum*, *Haploceras* (*Neolissoceras*) *desmoceratoides*,

Olcostephanus densicostatus, *Neocomites praediscus*, *Neocomites subpachydicranus*, *Rodighieroites* sp., *Jeanthieuolyites*, *Crioceratites* sp., *Criosarasinella furcillata*, *Bochianites oosteri*.

The typical ammonoid association and the appearance of *Criosarasinella furcillata* denote the *Criosarasinella furcillata* Zone, and especially the *C. furcillata* Subzone. *Neocomites praediscus* is in fact a species restricted to the *C. furcillata* Subzone.

The tectonically strongly deformed Lower Cretaceous sediments of the Ebenforst Syncline do not represent the best conditions for excellent preservation of entire ammonoids. The fragmentation of most ammonoids furnishes evidence for post-mortem transport, breakage on the sea floor through current effects, and/or consequences of predation of the cephalopod shells. The fragmentary preservation of such assemblages points to at least a minimal transportation. Most of the fractures in transported ammonoids do not appear to be of biogenic origin. In most cases they have resulted from the impact of shells with other bioclasts during episodes of current transport before interbedding.

The described specimens were deposited in sediments of the outer shelf. This reconstruction allows a tentative interpretation of the original habitat of the ammonoids investigated. They probably dwelled in more shallow waters than those in which they were ultimately deposited.

References

FAUPL, P. 1979. Turbidite series within the Cretaceous sequence of the Austroalpine unit and their paleogeographical significance. In: J. Wiedmann (Editor): Aspekte der Kreide Europas. IUGS Series, A 6, 403-411.

HOEDEMAEKER, P.J., REBOULET, ST., AGUIRRE-URRETA, M., ALSEN, P., AOUTEM, M. ATROPS, F., BARRANGUA R., COMPANY, M., GONZALES, C., KLEIN, J., LUKENEDER, A., PLOCH, I., RAISOSSADAT, N., RAWSON, P., ROPOLO, P., VAŠÍČEK, Z., VERMEULEN, J. AND WIPPICH, M., 2003. Report on the 1st International Workshop of the IUGS Lower Cretaceous Ammonite Working Group, the 'Kilian Group' (Lyon, 11 September 2002). Cretaceous Research, 24, 89-94.

IMMEL, H. 1987. Die Kreideammoniten der Nördlichen Kalkalpen. Zitteliana, 15, 3-163.

VAŠÍČEK, Z. and FAUPL P. 1998. Late Valanginian cephalopods in relation to the palaeogeographic position of the Rossfeld and Schrambach Formation of the Reichraming Nappe (Northern Calcareous Alps, Upper Austria). - Zentralblatt für Geologie und Paläontologie, Teil 1 H 11/12, 1421-1432.

Alexander LUKENEDER
Natural History Museum
Geological-Palaeontological Department
Burgring 7
A-1010 Vienna
Austria
e-mail: alexander.lukeneder@nhm-wien.ac.at