Ammonite stratigraphy in Early Cretaceous sedimentary rocks of the central Northern Calcareous Alps (Salzburg, Austria)

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In a well preserved complete succession from the Late Jurassic to the Early Cretaceous outcropping in hemipelagic marls determinable ammonites were found at the Leube quarry (Salzburg). Stratigraphy with ammonites is not known from the quarry until now, only PLÖCHINGER found 1955 in marly limestones *Fuhriella michaelis* (UHLIG, 1902) and 1968 in greenish-grey marls *Bochianites neocomiensis* (D´ORBIGNY, 1842) and *Kilianella roubaudiana* (D'ORBIGNY, 1850). The first new found ammonites occur over thin bedded radiolarian turbidites in greenish-reddish marly limestones. Greenish-grey-brown marls with plant remnants are also ammonite bearing and the highest ammonite level is between the marl-limestone succession above the marls. For the ammonite zonation we follow REBOULET et al. (2009). *Lytoceras* sp. and *Phylloceras* sp. are not of biostratigraphic interest. The occurrence of *Spiticeras* sp. and *Berriasella* sp. shows the uppermost Late Berriasian (*Subthurmannia boissieri* Zone) and the lower part of the Early Valanginian (*Tirnovella pertransiens* and *Busnardoites campylotoxus* Zone) (DRUSCHITS 1973, VASICEK et al. 1999). A little bit higher the apperance of *Fuhriella michaelis* (UHLIG, 1902) gives still an earliest Valanginian age (*Tirnovella pertransiens* and *Busnardoites campylotoxus* Zone (VASICEK et al. 1999, WIPPICH 2003). *Kilianella roubaudiana* (D´ORBIGNY, 1850) is known from the Late Berriasian (*Subthurmannia boissieri* Zone, VASICEK et al. 1999) and the Early-Late Valanginian (*Tirnovella pertransiens-Saynoceras verrucosum* Zone, DRUSCHITS 1973, WIPPICH 2003). Here it occurs with *Bochianites neocomiensis* (D´ORBIGNY, 1842) which is known from the Early Valanginian (*Tirnovella pertransiens* and *Busnardoites campylotoxus* Zone, VASICEK et al. 1999, WIPPICH 2003) and also from the Late Valanginian (*Saynoceras verrucosum* Zone, VASICEK & FAUPL 1999, LUKENEDER 2004, LUKENEDER & REHAKOVA 2004). Therefore the age for the marly part of the profile is here first described with ammonites from the *Subthurmannia boissieri* Zone of Late Berriasian to the *Busnardoites campylotoxus* Zone of Early Valanginian. To declare a strict Berriasian-Valanginian boundary more detailed stratigraphic information is needed. The first ammonite dating defines clearly the age range of the investigated succession as a time equivalent of the Schrambach (Marls and hemipelagic limestones) and the Lower Rossfeld Formation (Marls and marl-turbiditic limestone sequence). Interestingly the facies, lithology and thickness of booth formations here is different from the type-locality of the Schrambach and the Rossfeld Formation further to the south.

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The geology and sedimentology of the Hochreithberg (Salzburg): Cherty limestones and breccias as a tool for palaeogeographic reconstructions in the Late Jurassic of the central Northern Calcareous Alps

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On top of the Mount Hochreith, east of Golling (Tennengau, Salzburg) in the central Northern Calcareous Alps (NCA), are since PLÖCHINGER (1977) cherty limestones of the Hochreith Formation known. Firstly interpreted as part of the Valanginian Lower Rossfeld Formation nowadays the radiolarian-spicula pack- to wackestones with chromite, apatite and garnet (WOLETZ in PLÖCHINGER 1977 and own data) are dated by radiolarians and give a Late Kimmeridgian-Early Tithonian age (KRISCHE et al. 2008). In deeper parts of the profile some breccia layers occur in between the cherty limestones. The blackish grey cherty

limestones with a grey micritic-brown clayey matrix show also radiolarian-spicula packstones with sliding textures. Intercalated are micrite clast layers and sheddings of micrite and sparite clasts with foraminifera, small shells and heavy minerals. In general the whole microfacies fabric shows a lot of slidings, very fine grained turbidites and movements of the fine grained material as very slowly creepings. The unsorted and mixed breccias are mostly grain supported. There the components are pressed together and the rims show solution and clay coating. At some points the brown clayey radiolarian-spicula, micrite and sparite clast bearing matrix can be seen. The breccia layers bear mostly angular-subrounded carbonate lithoclasts (Micrites with foraminifera, shells, pellets and calcite cemented fenestral vugs, packstones with foraminifera, algae and crinoids, packstones with sparite bioclasts and shells, pelletspackstones, packstones with incrusted components and grapestone clasts, pack- to floatstones with crinoids, shells, foraminifera and sparite clasts, pelletsgrainstones with foraminifera, grainstones with pellets, crinoids and ooids). Interestingly are packstones with sparite clasts, crinoids and calpionellids. Some light green quartzose claystones, greenish marls, fine grained quartzsiltsones and quartzsiltstones with carbonate litho- and bioclasts can also be found. Single bioclasts are represented by crinoids, foraminifera, framework builders and bryozoans. These components allow to reconstruct a evolving Late Jurassic carbonate platform which was disintegrated and reworked in some parts during breccia formation. Calpionella lithoclasts with *Calpionella alpina* (Lorenz) in the breccias are the indication that the age of the breccias and the cherty limestones is fixed with a minimum age of Late Tithonian (Calpionellid zonation: Grün & Blau 1997). The siltstones and heavy minerals show a local siliciclastic input and the bioclasts represent the actual still growing carbonate producing area in Late Tithonian. So far the situation on the western part of Mount Hochreith shows a deeper part with cherty limestones and breccias of Late Tithonian and a higher part with cherty limestones of Late Kimmeridgian-Early Tithonian. Since Gawlick et al. (2009) the Hochreith Schichten are part of the Sillenkopf basin (Sillenkopf Formation: Missoni et al. 2001) in between the Plassen Carbonate Platform and the Lärchberg Platform. After deposition of the Hochreith Schichten and their overlying sequence (still in investigation) the whole sedimentary succession was affected by Late Tithonian normal faults (Gawlick et al. 2009, Missoni & Gawlick 2010). The breccias with platform carbonate components were shed into the basin between the Late Jurassic cherty limestones and the Hochreith Schichten inclusive their hanging wall slided down as a block in deeper parts of the basin. Further investigations around Mount Hochreith are needed and in process to get a clear information about the age and the distribution of the cherty radiolarian bearing limestones and about the sedimentary sequence underlying the Late Tithonian cherty limestones and the rocks in the hanging wall of the Late Kimmeridgian-Early Tithonian cherty limestones of the Hochreith Schichten.

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Component analysis, palaeogeographic and sedimentological reconstructions of the Rossfeld conglomerate at the Leube quarry (central Northern Calcareous Alps, Salzburg)

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At the Leube open pit, south of the city of Salzburg, a complete Late Jurassic-Early Cretaceous basinal succession of the central Northern Calcareous Alps (NCA) occur. Above greenish-grey, marly limestones with marl intercalations ammonite bearing greenish-grey-brown marly rocks with plant remnants and bedded, grey limestones with marl intercalations of Late Berriasian to Early Valanginian (Krische et al. 2010) occur. The overlying rocks show a brown-black-green marly-clayey matrix with angular-rounded clasts up to 1 m in diameter and represent the conglomeratic Upper Rossfeld Formation. Until today only macroscopic determination of the components is known from the Leube area (Plöchinger 1968, 1974). Nowadays the components of the mixed and unsorted polymict Rossfeld conglomerates can be determined also microscopically by microfacies analysis. The clasts can be sorted in groups of different palaeogeographic origin. Siliciclastic resediments or intraclasts are represented by fine grained, glauconitic quarzites and brownish quartzose siltstones. Additionally carbonate producing organisms like brachiopods, bryozoans, crinoids, foraminifera and stromatoporoids are sedimented as bioclasts. Also lithoclasts with a fine grained siliciclastic matrix with bioclasts and smaller carbonate lithoclasts are common. Subrounded-angular rock