

Reference section(s): Section Oberbuchach 1 along the Gundersheimer Almroad, Bischofalmgraben, Collendiaul (SCHÖNLAUB, 1981, 1985a: p. 40, 72).

Derivation of name: After the locality Bischofalm in the Carnic Alps (Austria).

Synonyms: Basal quartzite (JAEGER & SCHÖNLAUB, 1980: p. 404); Quarzite (JAEGER & SCHÖNLAUB, 1980: Fig. 1); dünne quarzitische Lagen (SCHÖNLAUB, 1985a: p. 40).

Lithology: Dark grey to grey, thin quartzite beds, dolomitic sandstone (JAEGER & SCHÖNLAUB, 1980: p. 411; SCHÖNLAUB, 1981).

Fossils: -

Origin, facies: Marine siliciclastics, pelagic unit.

Chronostratigraphic age: Based on the above deposited graptolite-yielding shales (Lower Bischofalm Shale) which are early Silurian in age (see SCHÖNLAUB, 1979: Fig. 17 and updated version in SCHÖNLAUB, 1985a: Fig. 13), a late Ordovician to early Silurian age is proposed for this unit by JAEGER & SCHÖNLAUB (1980) and SCHÖNLAUB (1981).

Biostratigraphy: -

Thickness: Approx. 80 m.

Lithostratigraphically higher rank unit: Bischofalm Nappe (informal).

Lithostratigraphic subdivision: -

Underlying unit(s): Val Visdende Formation (conformable contact?).

Overlying unit(s): Lower Bischofalm Shale (conformable contact).

Lateral unit(s): Uggwa Shale, Uggwa Limestone, Plöcken Formation.

Geographic distribution: Carnic Alps.

Remarks: -

Complementary references: SCHÖNLAUB (1985a, 1991), SCHÖNLAUB & HEINISCH (1994), SCHÖNLAUB & HISTON (2000), HUBMANN et al. (2003).

Wolayer-Kalk / Wolayer Limestone

THOMAS J. SUTTNER, HANS P. SCHÖNLAUB,
ANNALISA FERRETTI

Validity: Invalid; first observed by STACHE (1884: p. 337); better described by GAERTNER (1931), who already used the name Wolayer Kalk for this unit; later included within the summary of the Variscan carbonate sequences in the Carnic Alps (KREUTZER, 1992b).

Type area: ÖK50-UTM, map sheets 3109 Oberdrauburg, 3110 Kötschach-Mauthen, 3116 Sonnenalpe Naßfeld (ÖK50-BMN, map sheets 197 Kötschach, 198 Weißbriach).

Type section: Rauchkofelboden (GAERTNER, 1931: p. 136–137); N 46°36'54" / E 12°52'30"; altitude 2,153 m.

Reference section(s): Seekopfsockel (N 46°36'33" / E 12°51'58"), Valentintörl (SCHÖNLAUB, 1980b).

Derivation of name: After the Wolayer region in the central Carnic Alps (Austria).

Synonyms: Stufe der weissen und grauen Kalke (STACHE, 1884); Graue, massige, versteinungsleere Kalke auf der Höhe des Thörl (FRECH, 1887: p. 685); Graue massige Kalke (FRECH, 1894b: Fig. 82); massige Bank von grauem oder rötlichem, aber hell anwitterndem Kalk [partim] (GEYER,

1903); Helle, massige Bank (SPITZ, 1909); roter und weißer, hell verwitternder Krinoidenkalk [partim] (GAERTNER, 1931); Krinoidenkalk ("helle Bank") [partim] (HABERFELNER & HERITSCH, 1932b); Biocalculititi mandorlate ("Tonflaserkalk") (MANARA & VAI, 1970); Grey massive crinoid limestone (SCHÖNLAUB, 1971a: p. 369); Ashgill-Crinoiden-Calcarenit der "Bewegtwasser-Fazies" (SCHÖNLAUB, 1971a: Fig. 2); Calcare a crinoidi, bioruditic l. ("Cystoideenkalk") (SPALLETTA et al., 1982: p. 282–283); Cystoideen-Kalk (DULLO, 1992); Cystoidean Limestone (DULLO, 1992).

Lithology: White massive, sparry crinoidal debris limestone (KREUTZER, 1992b).

Fossils: Bryozoans, crinoids, conodonts, cystoids, ostracods (rare), trilobites.

Origin, facies: Marine limestone, neritic unit consisting of parautochthonous bioclasts derived from crinozoan mounds (DULLO, 1992).

Chronostratigraphic age: Upper Ordovician (Katian-Hirnantian).

Biostratigraphy: *ordovicicus* conodont zone (FERRETTI & SCHÖNLAUB, 2001).

Thickness: 10–17 m.

Lithostratigraphically higher rank unit: Himmelberg Facies (informal).

Lithostratigraphic subdivision: -

Underlying unit(s): Himmelberg Sandstone (conformable contact). Following HUBICH & LOESCHKE (1993: Fig. 3; p. 355) and SCHÖNLAUB & FLAJS (1993: p. 236 and 240–241), the Comelico Porphyry or the Fleons Greywacke, respectively, are not directly overlain by the Wolayer Limestone as shown in the ASC 2004.

Overlying unit(s): Plöcken Formation (unconformable contact); Kok Formation (unconformable contact).

Lateral unit(s): Uggwa Limestone.

Geographic distribution: Carnic Alps.

Remarks: -

Complementary references: HABERFELNER & HERITSCH (1932b), HERITSCH (1932), SCHÖNLAUB (1979, 1991, 1992, 2000b), SCHÖNLAUB et al. (1997, 2004), VAI (1998), SCHÖNLAUB & HISTON (2000).

Uggwa-Kalk / Uggwa Limestone

THOMAS J. SUTTNER, HANS P. SCHÖNLAUB,
ANNALISA FERRETTI

Validity: Invalid; already mentioned by STACHE (1884) as Knollenkalk; first described by GAERTNER (1931); further observed by VAI (1971) and SCHÖNLAUB (1971a, 1979, 1985a); later included within the summary of the Variscan carbonate sequences in the Carnic Alps (KREUTZER, 1992b).

Type area: ÖK50-UTM, map sheets 3109 Oberdrauburg, 3110 Kötschach-Mauthen, 3111 Spittal an der Drau, 3116 Sonnenalpe Naßfeld, 3117 Nötsch im Gailtal (ÖK50-BMN, map sheets 197 Kötschach, 199 Hermagor).

Type section: Cellon avalanche gully (see remarks), Beds 1–4+ after WALLISER (1964); N 46°36'32" / E 13°29'03"; altitude 1,500 m.

Reference section(s): Uggwa creek (VAI, 1971), N 46°33'05" / E 13°29'13"; Valentintörl, Feistrizgraben, Nölblinggraben (SCHÖNLAUB, 1985a: p. 36; DULLO, 1992).

Derivation of name: After Uggwa creek, 200 m NNE of Rifugio Fratelli Nordio close to the village of Ugovizza in Friuli-Venezia Giulia, Italy (VAI, 1971).

Synonyms: Knollenkalk (STACHE, 1884: p. 324); Tonflaserkalke (SPITZ, 1909); Ashgill (GAERTNER, 1931: p. 133); Bereich I [partim] (WALLISER, 1964: Fig. 10, Tab. 1, p. 95); Nodular Limestone Member of the Uqua Formation (VAI, 1971); Flaserkalke, Knollenkalke, Kalkknollenschiefer (SCHÖNLAUB, 1971a: p. 368); Ashgill-Tonflaserkalk der "Stillwasser-Fazies" (SCHÖNLAUB, 1971a: Fig. 2); Uggwakalk (SCHÖNLAUB, 1979: Fig. 19, p. 44); Formazione di Uqua (VAI et al., 1984); Uggwa Formation (KREUTZER, 1992b).

Lithology: Grey to colored flaser limestone with bioclastic debris layers (KREUTZER, 1992b).

Fossils: Acritarchs, brachiopods, cephalopods, chitinozoans, crinoids, foraminifers, ostracods, styliolinids, tentaculites, trilobites.

Origin, facies: Marine limestone, represented by allochthonous deposits of deeper marine settings that derived from the higher energetic Wolayer Limestone (FLÜGEL, 1965; SCHÖNLAUB, 1971a; DULLO, 1992).

Chronostratigraphic age: Upper Ordovician (Katian).

Biostratigraphy: *ordovicicus* conodont zone (SERPAGLI, 1967; FERRETTI & SCHÖNLAUB, 2001).

Thickness: 1.1 m (at Rifugio Fratelli Nordio) to 5.4 m (at Cellon).

Lithostratigraphically higher rank unit: Uggwa Facies (informal).

Lithostratigraphic subdivision: -

Underlying unit(s): Uggwa Shale (conformable contact).

Overlying unit(s): Plöcken Formation (conformable contact).

Lateral unit(s): Wolayer Limestone, Bischofalm Quartzite.

Geographic distribution: Carnic Alps.

Remarks: At the section north of Rifugio Fratelli Nordio the thickness of this unit is limited to 1.1 m to some 3 m compared with the type section at Cellon (5.4 m). In addition, the overlying Plöcken Formation is badly exposed as is the overlying shale sequence. According to JAEGER et al. (1975, p. 275) and SCHÖNLAUB (1988: p. 109) a distinct lithological change takes place within bed no. 5 or slightly below. This level defines the base of the succeeding Plöcken Formation ("4+").

Complementary references: SCHÖNLAUB (1980b, 1991, 1992, 2000b), PRIEWALDER (1987, 1997, 2000), BAGNOLI et al. (1998), BOGOLEPOVA & SCHÖNLAUB (1998), VAI (1998), SCHÖNLAUB & HISTON (2000), HUBMANN et al. (2003), SCHÖNLAUB et al. (2004), VENTURINI (2006), BRIME et al. (2008).

Plöcken-Formation / Plöcken Formation

THOMAS J. SUTTNER, HANS P. SCHÖNLAUB,
ANNALISA FERRETTI

Validity: Valid (KREUTZER, 1992b sensu WALLISER, 1964); first description by GAERTNER (1931: p. 133) followed by SCHÖNLAUB (1969a: p. 280–281) and JAEGER et al. (1975: p. 275–278); name first used by SCHÖNLAUB (1985a: p. 38).

Type area: ÖK50-UTM, map sheets 3109 Oberdrauburg, 3110 Kötschach-Mauthen, 3116 Sonnenalpe Naßfeld (ÖK50-BMN, map sheet 197 Kötschach).

Type section: Cellon avalanche gully, beds 6–8 (WALLISER, 1964), beds 5–8 (SCHÖNLAUB, 1985a); N 46°36'32" / E 12°56'25"; altitude 1,500 m.

Reference section(s): Section Hoher Trieb south of Obere Bischofalm (SCHÖNLAUB, 1969a, 1980b: Fig. 27, p. 50); Feistrizgraben (SCHÖNLAUB, 1980b: Figs. 4, 28; p. 52).

Derivation of name: After the geographic name "Plöcken" in the central Carnic Alps (Austria).

Synonyms: Untere Schichten (GAERTNER, 1931: p. 133); Bereich I [partim] (WALLISER, 1964: Fig. 10, Tab. 1, p. 95); Mikrofazies-Schicht '2: "Schillsandstein" and Mikrofazies-Schicht '3: "Gradierte Sandsteine" (SCHÖNLAUB, 1969a); Siltstone and Sandstone (VAI, 1971).

Lithology: Coarse-grained indistinctly bedded impure limestones which grade into calcareous sandstone. In the lower part contorted deformation structures, slumpings, channel fillings, loosely packed matrix-supported subangular clasts of varying composition are common as is the accumulation of fossil debris.

Fossils: Acritarchs (PRIEWALDER, 1987), calcareous algae, bivalves, brachiopods (JAEGER et al., 1975), chitinozoans (PRIEWALDER, 1997), conodonts (WALLISER, 1964; FERRETTI & SCHÖNLAUB, 2001), crinoids, gastropods, graptolites (rare), ostracods (SCHALLREUTER, 1990), sponge spicula (FERRETTI & SCHÖNLAUB, 2001).

Origin, facies: Marine sediments, which according to SCHÖNLAUB (2000b) are strongly influenced by the Late Ordovician glacial event. The influence of the Hirnantian ice age on the depositional environment is characterized by channeling, erosion and local non-deposition.

Chronostratigraphic age: Upper Ordovician (Hirnantian).

Biostratigraphy: *persculptus* graptolite zone (JAEGER et al., 1975) and a mixed conodont fauna including elements of the *ordovicicus* Zone and some stratigraphically slightly younger species (FERRETTI & SCHÖNLAUB, 2001).

Thickness: Varies between 1.5 and 9 m; at its type section, the unit reaches 5.4 m in thickness.

Lithostratigraphically higher rank unit: Uggwa Facies (informal).

Lithostratigraphic subdivision: -

Underlying unit(s): Wolayer Limestone (unconformable contact), Uggwa Limestone (conformable contact).

Overlying unit(s): Kok Formation (unconformable contact); Nöbling Formation (unconformable contact).

Lateral unit(s): Bischofalm Quartzite.

Geographic distribution: Carnic Alps.

Remarks: -

Complementary references: SPITZ (1909), SCHÖNLAUB (1971a, 1991), PRIEWALDER (2000), SCHÄTZ et al. (1997, 2002), VAI (1998), SCHÖNLAUB & HISTON (2000), HUBMANN et al. (2003), SCHÖNLAUB et al. (2004).

Austrian Stratigraphic Chart 2004 - Paleozoic

(sedimentary successions)

Austrian Stratigraphic Commission



ERA	SYSTEM / PERIOD / SERIES / EPOCH	STAGE / AGE	DURATION Ma	Global Classification					
				ERATHM / ERA	SYSTEM / PERIOD / SERIES / EPOCH				
PALEOZOIC	PERMIAN	CHANGHSINGIAN / Dorashanian	251	PERMIAN	MID PERMIAN / GUADALUPIAN				
		WUCHIAPINGIAN / Dzhulfian	255						
		CAPITANIAN	260						
		WORDIAN	265						
		ROADIAN	270						
		PERMIAN	LOWER PERMIAN / CISURALIAN			KUNGURIAN	275		
						ARTINSKIAN	280		
						SAKMARIAN	285		
						ASSELIAN	290		
		PERMIAN	UPPER PERMIAN / CARBONIFEROUS PENNSYLVANIAN			GZHELIAN	295	PERMIAN	LOWER PERMIAN / CISURALIAN
KASIMOVIAN	300								
MOSKOVIAN	305								
BASHKIRIAN	310								
PERMIAN	UPPER PERMIAN / CARBONIFEROUS PENNSYLVANIAN			SERPUKHOVIAN	315				
				VISEAN	320				
					325				
PERMIAN	LOWER PERMIAN / MISSISSIPPIAN			TOURNAISIAN	330	PERMIAN	LOWER PERMIAN / MISSISSIPPIAN		
				335					
				340					
		345							
		350							
		355							
		359.2							
		PERMIAN	UPPER DEVONIAN	FAMENNIAN	365			PERMIAN	UPPER DEVONIAN
				FRASNIAN	370				
				375					
380									
385									
390									
395									
400									
405									
410									
PERMIAN	LOWER DEVONIAN	EMSIAN	415	PERMIAN	LOWER DEVONIAN				
		PRAGIAN	420						
		LOCHKOVIAN	425						
		430							
		435							
		440							
		443.7							
		445							
		PERMIAN	UPPER ORDOVICIAN			HIRNANTIAN	447	PERMIAN	UPPER ORDOVICIAN
						450			
455									
460									
465									
470									
475									
480									
485									
488.3									
PERMIAN	MIDDLE ORDOVICIAN	TREMACIAN	490	PERMIAN	MIDDLE ORDOVICIAN				
		495							
		500							
		505							
		510							
		515							
		520							
		525							
		530							
		535							
PERMIAN	LOWER ORDOVICIAN	PAIBIAN	540	PERMIAN	LOWER ORDOVICIAN				
		545							
		550							
		555							
		560							
		565							
		570							
		575							
		580							
		585							
CAMBRIAN	UPPER CAMBRIAN	UPPER CAMBRIAN	UPPER CAMBRIAN	CAMBRIAN	UPPER CAMBRIAN				
						590			
						595			
						600			
						605			
						610			
						615			
						620			
						625			
						630			
CAMBRIAN	MIDDLE CAMBRIAN	MIDDLE CAMBRIAN	MIDDLE CAMBRIAN	CAMBRIAN	MIDDLE CAMBRIAN				
						635			
						640			
						645			
						650			
						655			
						660			
						665			
						670			
						675			
CAMBRIAN	LOWER CAMBRIAN	LOWER CAMBRIAN	LOWER CAMBRIAN	CAMBRIAN	LOWER CAMBRIAN				
						680			
						685			
						690			
						695			
						700			
						705			
						710			
						715			
						720			



- Legend**
- pelagic, offshore, siliciclastic
 - pelagic, nearshore, calcareous
 - shallow marin, neritic
 - terrestrial-continental, coarse clastic
 - terrestrial-continental, fine clastic
 - evaporite (chloride, sulphate)
 - rhyolite, dacite
 - (basaltic) andesite, trachyandesite
 - basalt
 - phyllite
 - mixed-facies (in corresponding colors)
 - coal (may include several seams)
 - ? position/age doubtful/controversial
 - | equal units
 - \ older unit left \ younger unit right
 - hiatus
 - unconformity
 - GSSP
 - Fm. Formation
 - Ls. Limestone

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Cutout and English adaptation of the "Die Stratigraphische Tabelle von Österreich 2004": Geological Survey of Austria

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