

Biostratigraphy: *australis*, *ensensis*, *triangularis* and *crepida* conodont zones (SCHULZE, 1968; MOSHAMMER, 1989: Fig. 10).

Thickness: Approx. 250 m (according to KUPSCH et al., 1971).

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): Bronteus Limestone (conformable contact).

Overlying unit(s): Limestones (unconformable contact).

Lateral unit(s): Seeland Crinoidal Limestone.

Geographic distribution: Karavanke Mountains (Eisenkappel and Seeberg area).

Remarks: -

Complementary references: PENECKE (1887), TESSENSOHN (1974a), SCHÖNLAUB (1979), MOSHAMMER (1987), RANTITSCH (1990, 1992b), FENNINGER & HUBMANN (1994), SCHÖNLAUB & HISTON (1999, 2000), HUBMANN et al. (2003).

Seeland Crinoidenkalk / Seeland Crinoidal Limestone

THOMAS J. SUTTNER

Validity: Invalid; first recognized by LIPOLD (1856a); named by FRECH (1894a); lithological and biostratigraphic investigations by SCHULZE (1968), TESSENSOHN (1974b) and MOSHAMMER (1989, 1990).

Type area: ÖK50-UTM, map sheet 4114 Bad Eisenkappel (ÖK50-BMN, map sheets 212 Vellach, 213 Bad Eisenkappel).

Type section: -

Reference section(s): Grosser Pasterk (N 46°26'24" / E 14°32'31"), Kleiner Pasterk-Pasterkhube (N 46°26'12" / E 14°32'45"), Paulitsch Wand (N 46°25'10" / E 14°34'40"), Plasnik (N 46°26'05" / E 14°34'54"), Sadonig Höhe (N 46°26'12" / E 14°35'42"), Storschitz (N 46°25'46" / E 14°31'33") published by TESSENSOHN (1974b); Trögen Klamm section-group B (N 46°28'00" / E 14°30'24"), C (N 46°27'59" / E 14°35'03"), E (N 46°28'00" / E 14°30'30"), F1 (N 46°28'02" / E 14°30'12"), F2 (N 46°28'01" / E 14°30'18") published by MOSHAMMER (1989, 1990).

Derivation of name: After lithological characters of the unit at the Seeland section (FRECH, 1894a).

Synonyms: Gailthaler Schichten [partim] (LIPOLD, 1856a); Seeländer Storžič (TELLER, 1886b); Seeländer Krinoidenbrekzie (FRECH, 1894a); graublaue Krinoidenbrekzienkalke und graublaue splitterige Kalke (HERITSCH, 1927d); Krinoiden- und Korallenkalk (SCHULZE, 1968); grauer Riffkalk (mit Krinoiden und Korallen) (SCHULZE, 1968); Crinoidenkalke (TESSENSOHN, 1974b); Seeländer Crinoidenbreccie (SCHÖNLAUB, 1979); Slump aus Flaserkalk und sparitischen Schuttkalk (MOSHAMMER, 1990: Fig. 2).

Lithology: Bioclastic limestone.

Fossils: Conodonts, crinoids, corals, stromatoporoids.

Origin, facies: Marine limestone, neritic unit, fore reef facies (SIEWERT, 1984).

Chronostratigraphic age: Emsian–Frasnian.

Biostratigraphy: *serotinus* and *patulus* conodont zones (MOSHAMMER, 1989).

Thickness: Approx. 200 m.

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): Bronteus Limestone (conformable contact).

Overlying unit(s): Limestones (unconformable contact).

Lateral unit(s): Reef Limestone; Seeberg Coral-Crinoidal Limestone.

Geographic distribution: Karavanke Mountains (Eisenkappel and Seeberg area).

Remarks: -

Complementary references: PENECKE (1887), TESSENSOHN (1974a), SCHÖNLAUB (1979), MOSHAMMER (1987), RANTITSCH (1990, 1992b), SCHÖNLAUB & HISTON (1999, 2000).

Seeberger Korallen-Crinoidenkalk / Seeberg Coral-Crinoidal Limestone

THOMAS J. SUTTNER

Validity: Invalid; first recognized by LIPOLD (1856b); named by STACHE (1884); lithological and biostratigraphic investigations by SCHULZE (1968), TESSENSOHN (1974b) and MOSHAMMER (1989, 1990).

Type area: ÖK50-UTM, map sheet 4114 Bad Eisenkappel (ÖK50-BMN, map sheets 212 Vellach, 213 Bad Eisenkappel).

Type section: -

Reference section(s): Grosser Pasterk (N 46°26'19" / E 14°32'29"), Jeritsch-Felsen (N 46°24'52" / E 14°32'37"), south of Storschitz (N 46°25'29" / E 14°31'24") published by TESSENSOHN (1974b); Trögen Klamm section-group B (N 46°28'00" / E 14°30'24"), C (N 46°27'59" / E 14°35'03"), E (N 46°28'00" / E 14°30'30"), F1 (N 46°28'02" / E 14°30'12"), F2 (N 46°28'01" / E 14°30'18") published by MOSHAMMER (1989, 1990).

Derivation of name: After coral and crinoid bearing limestones in the surroundings of Seeberg Pass (STACHE, 1884).

Synonyms: Gailthaler Kalk (LIPOLD, 1856b: p. 350); Seeberger Korallen- und Crinoidenkalk (STACHE, 1884: Tab. at end of publication); Crinoiden- und Korallenkalke (TELLER, 1886a); Korallenkalke und Crinoidenkalkbreccien (TELLER, 1886b); Seeberger Riffkalke (TELLER, 1886b); Riffkalke des Seeberges (TELLER, 1886c); grauer spätiger Kalk des Mitteldevon (SCHULZE, 1968); Riff- und Riffschuttkalk (KUPSCH et al., 1971); Korallenkalke (TESSENSOHN, 1974b); "Riff-Rudstone" (MOSHAMMER, 1990: p. 574).

Lithology: Coral limestone with crinoidal limestone interbedded.

Fossils: Brachiopods, conodonts, corals, crinoids, ostracods, stromatoporoids.

Origin, facies: Marine limestone, neritic unit, reef core facies (compare SIEWERT, 1984).

Chronostratigraphic age: Emsian–Famennian.

Biostratigraphy: *australis* and *ensensis* conodont zones (MOSHAMMER, 1989).

Thickness: Approx. 250 m (following KUPSCH et al., 1971).

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): Bronteus Limestone (conformable contact).

Overlying unit(s): Limestones (unconformable contact).

Lateral unit(s): Seeland Crinoidal Limestone; Limestones, Lydites; Lydites, Limestone Breccia; Shale, Limestones.

Geographic distribution: Karavanke Mountains (Eisenkappel and Seeberg area).

Remarks: -

Complementary references: PENECKE (1887), SCHÖNLAUB (1971b, 1979), TESSENSOHN (1974a), MOSHAMMER (1987), RANTITSCH (1990, 1992b), RAMOVŠ (1999), SCHÖNLAUB & HISTON (1999, 2000).

Kalke, Lydite / Limestones, Lydites

THOMAS J. SUTTNER

Validity: Invalid; described by KUPSCH et al. (1971); lithological characters and biostratigraphy by TESSENSOHN (1974a) and MOSHAMMER (1989, 1990).

Type area: ÖK50-UTM, map sheet 4114 Bad Eisenkappel (ÖK50-BMN, map sheets 212 Vellach, 213 Bad Eisenkappel).

Type section: -

Reference section(s): Stanwiese section in Vellach (TESSENSOHN, 1974a: p. 115); Trögen Klamm section-group B (N 46°28'00" / E 14°30'24"), C (N 46°27'59" / E 14°35'03"), E (N 46°28'00" / E 14°30'30"), F1 (N 46°28'02" / E 14°30'12"), F2 (N 46°28'01" / E 14°30'18") published by MOSHAMMER (1989, 1990).

Derivation of name: After dominating lithologies.

Synonyms: Dunkelblaugraue, gebankte, verkieselte Schuttkalke (MOSHAMMER, 1990: Fig. 2); schwarzer Lydit (MOSHAMMER, 1990); "Radiolarien Chert" (MOSHAMMER, 1990: p. 575).

Lithology: Blackish limestone alternating with lydites and blackish shale.

Fossils: Conodonts, crinoids, radiolarians.

Origin, facies: Marine limestone, pelagic unit.

Chronostratigraphic age: Emsian–Givetian.

Biostratigraphy: *varcus* conodont zone (MOSHAMMER, 1989).

Thickness: Approx. 30 m.

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): Bronteus Limestone (conformable contact).

Overlying unit(s): Lydites, Limestone Breccia (conformable contact).

Lateral unit(s): Seeberg Coral-Crinoidal Limestone.

Geographic distribution: Karavanke Mountains (Eisenkappel and Seeberg area).

Remarks: -

Complementary references: SCHÖNLAUB (1971b, 1979), MOSHAMMER (1987), SCHÖNLAUB & HISTON (1999, 2000).

Lydite, Kalkbreckzie / Lydites, Limestone Breccia

THOMAS J. SUTTNER

Validity: Invalid; first recognized by LIPOLD (1856b); later described by KUPSCH et al. (1971); lithologically defined and biostratigraphically dated by TESSENSOHN (1974a) and MOSHAMMER (1989, 1990).

Type area: ÖK50-UTM, map sheet 4114 Bad Eisenkappel (ÖK50-BMN, map sheets 212 Vellach, 213 Bad Eisenkappel).

Type section: -

Reference section(s): Hainschgraben near Zell Pfarre (Eisenkappel area); Stanwiese section in Vellach (TESSENSOHN, 1974a: p. 115); Trögen Klamm section-group B (N 46°28'00" / E 14°30'24"), C (N 46°27'59" / E 14°35'03"), E (N 46°28'00" / E 14°30'30"), F1 (N 46°28'02" / E 14°30'12"), F2 (N 46°28'01" / E 14°30'18") published by MOSHAMMER (1989, 1990).

Derivation of name: After dominating lithologies.

Synonyms: Gailthaler Schichten (Kalk und Schiefer) (LIPOLD, 1856b: p. 349); schwarzer Lydit (MOSHAMMER, 1990: Fig. 2); "Radiolarien Chert" (MOSHAMMER, 1990: p. 575).

Lithology: Limestone breccia (with pebble sized components of reef rubble), lydite alternating with limestone beds.

Fossils: Conodonts, corals, crinoids, radiolarians.

Origin, facies: Marine pelagic deposits; note wrong color code in the ASC 2004.

Chronostratigraphic age: Givetian–Frasnian.

Biostratigraphy: *varcus* conodont zone (MOSHAMMER, 1989).

Thickness: Approx. 6 m.

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): Limestones, lydites (conformable contact).

Overlying unit(s): Shale, limestones (conformable contact).

Lateral unit(s): Seeberg Coral-Crinoidal Limestone.

Geographic distribution: Karavanke Mountains (Eisenkappel and Seeberg area).

Remarks: -

Complementary references: SCHÖNENBERG (1965, 1967), SCHÖNLAUB (1979), MOSHAMMER (1987), SCHÖNLAUB & HISTON (1999, 2000).

Tonschiefer, Kalke / Shale, Limestones

THOMAS J. SUTTNER

Validity: Invalid; first recognized by LIPOLD (1856b); later described by KUPSCH et al. (1971); lithologically defined and biostratigraphically dated by TESSENSOHN (1974a) and MOSHAMMER (1989, 1990).

Type area: ÖK50-UTM, map sheet 4114 Bad Eisenkappel (ÖK50-BMN, map sheets 212 Vellach, 213 Bad Eisenkappel).

Type section: -

Reference section(s): Stanwiese section in Vellach (TESSENSOHN, 1974a: p. 115); Trögen Klamm section-group B

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 / LOPINGIAN				
		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							
		365							
		370							
		375							
PERMIAN	UPPER DEVONIAN	FAMENNIAN	359.2	PERMIAN	UPPER DEVONIAN				
		FRASNIAN	365						
		GIVETIAN	370						
		EIFELIAN	375						
		PERMIAN	MIDDLE DEVONIAN			380			
						385			
		PERMIAN	LOWER DEVONIAN			EMSIA	385	PERMIAN	LOWER DEVONIAN
						390			
						395			
						400			
405									
410									
415									
420									
425									
430									
PERMIAN	SILURIAN	LUDFORDIAN / GORSTIAN	416	PERMIAN	SILURIAN				
		HOMERIAN / SHEINWOOD	420						
		TELYCHIAN	425						
		AERONIAN	430						
		RHUDDANIAN	435						
		HIRNANTIAN	440						
		443.7							
		445							
		450							
		455							
PERMIAN	UPPER ORDOVICIAN	446	PERMIAN	UPPER ORDOVICIAN					
		450							
		455							
		460							
		465							
		470							
		475							
		480							
		485							
		488.3							
PERMIAN	MIDDLE ORDOVICIAN	490	PERMIAN	MIDDLE ORDOVICIAN					
		495							
		500							
		505							
		510							
		515							
		520							
		525							
		530							
		535							
PERMIAN	LOWER ORDOVICIAN	540	PERMIAN	LOWER ORDOVICIAN					
		545							
		550							
		555							
		560							
		565							
		570							
		575							
		580							
		585							
CAMBRIAN	UPPER CAMBRIAN	590	CAMBRIAN	UPPER CAMBRIAN					
		595							
		600							
		605							
		610							
		615							
		620							
		625							
		630							
		635							
CAMBRIAN	MIDDLE CAMBRIAN	640	CAMBRIAN	MIDDLE CAMBRIAN					
		645							
		650							
		655							
		660							
		665							
		670							
		675							
		680							
		685							
CAMBRIAN	LOWER CAMBRIAN	690	CAMBRIAN	LOWER CAMBRIAN					
		695							
		700							
		705							
		710							
		715							
		720							
		725							
		730							
		735							



- 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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