

Kok-Formation / Kok Formation

THOMAS J. SUTTNER, HANS P. SCHÖNLAUB

Validity: Valid (KREUTZER, 1992b sensu WALLISER, 1964); name first used by SCHÖNLAUB (1985a: p. 38).

Type area: ÖK50-UTM, map sheets 3109 Oberdrauburg, 3110 Kötschach-Mauthen, 3111 Spittal an der Drau, 3112 Villach, 3116 Sonnenalpe Naßfeld, 3117 Nötsch im Gailtal, 3118 Arnoldstein (ÖK50-BMN, map sheets 197 Kötschach, 199 Hermagor, 200 Arnoldstein).

Type section: Cellon avalanche gully, beds 9–20 (WALLISER, 1964), N 46°36'32" / E 12°56'24".

Reference section(s): Rauchkofelboden, Kokberg, Valentintörl section.

Derivation of name: Kokberg [= Monte Cocco].

Synonyms: Untersilurische Schichten [partim] (STACHE, 1874); Rotheisenstein (SEELAND, 1878); Unterer Eisenkalk (FRECH, 1887); Grauer Netzkalk (GEYER, 1894); Thonschiefer (GEYER, 1894); Bunte Flaser- oder Bänderkalke und Kalkphyllite des Obersilur [partim] (GEYER, 1899); Unterer Orthocerenkalkniveau (GEYER, 1903); Calcare ad Orthoceras (VINASSA DE REGNY & GORTANI, 1905); Calcari reticolati con facies a Cefalopodi (GORTANI & VINASSA DE REGNY, 1909); Kokkalke (HERITSCH, 1929); Kokkalk (GAERTNER, 1931); Trilobitenschiefer (GAERTNER, 1931); Aulacopleura-schicht (GAERTNER, 1931; SCHÖNLAUB, 1985a); Krinoidenkalk ("helle Bank") [partim] (HABERFELNER & HERITSCH 1932b); Kok Limestone (SCHÖNLAUB, 1980b); Calcare ad Aulacopleura (SPALLETTA et al., 1982); Calcare del Cocco (SPALLETTA et al., 1982); Marne a trilobite (SPALLETTA et al., 1982); Crinoiden-Brachiopoden-Kalke (SCHÖNLAUB, 1985a); Aulacopleura Limestone (SPALLETTA & VENTURINI, 1989); Orthoceras Limestone (FERRETTI et al., 1999).

Lithology: Well bedded ferruginous grey and red limestone with blackish marly shale.

Fossils: Acritarchs (PRIEWALDER, 1987), bivalves (KRIZ, 1979, 1999), brachiopods (PŁODOWSKI, 1971, 1973), cephalopods (RISTEDT, 1968; BOGOLEPOVA, 1998; HISTON, 1999), chitinozoans (PRIEWALDER, 1997), conodonts (WALLISER, 1964; SCHÖNLAUB, 1979), foraminifers (LANGER, 1969), gastropods, graptolites (JAEGER, 1975), trace fossils (HISTON & SCHÖNLAUB, 1999), trilobites (HAAS, 1969; SANTEL, 1999).

Origin, facies: Marine limestone, neritic and pelagic units are discriminated (Plöcken Facies).

Chronostratigraphic age: Llandovery–Ludlow.

Biostratigraphy: *celloni*, *amorphognathoides*, *patula*, *sagitta*, *bohemica* and *ploeckensis* conodont zones (WALLISER, 1964); *potens* orthoceric zone (HISTON et al., 1999).

Thickness: Approx. 15 m (neritic unit), 4 m (pelagic unit).

Lithostratigraphically higher rank unit: Plöcken Facies (informal).

Lithostratigraphic subdivision: -

Underlying unit(s): Wolayer Limestone (unconformable contact); Plöcken Formation (unconformable contact).

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

Lateral unit(s): Nölbling Formation.

Geographic distribution: Carnic Alps.

Remarks: -

Complementary references: FRECH (1887), SPITZ (1909), HERITSCH (1932, 1943), FLÜGEL (1965), PÖLSLER (1967), MANARA & VAI (1970), SCHÖNLAUB (1970, 1982c, 1991, 1997), TIETZ (1976), KREUTZER (1994), SCHÖNLAUB et al. (1997, 2004), WENZEL (1997), VAI (1998, 1999), PASAVA & SCHÖNLAUB (1999), FERRETTI et al. (1999), PRIEWALDER (2000), SCHÖNLAUB & HISTON (2000), CORRADINI et al. (2003), HUBMANN et al. (2003), LOYDELL (2003), FERRETTI (2005), BRIME et al. (2008), BRETT et al. (2009).

Nölbling-Formation / Nölbling Formation

THOMAS J. SUTTNER, HANS P. SCHÖNLAUB

Validity: Valid (JAEGER & SCHÖNLAUB, 1977); first described by GEYER (1895).

Type area: ÖK50-UTM, map sheets 3108 Sillian, 3109 Oberdrauburg, 3110 Kötschach-Mauthen, 3111 Spittal an der Drau, 3116 Sonnenalpe Naßfeld (ÖK50-BMN, map sheets 197 Kötschach, 198 Weißbriach, 199 Hermagor).

Type section: Nölblinggraben (JAEGER & SCHÖNLAUB, 1977: p. 351), N 46°38'14" / E 13°05'04".

Reference section(s): Gundersheimer Alm road (Oberbuchach section), Collendiaul, Dellacher Alm (JAEGER & SCHÖNLAUB, 1980; BRETT et al., 2009).

Derivation of name: After the Nölblinggraben near the village of Nölbling (JAEGER & SCHÖNLAUB, 1977).

Synonyms: Complex von Thonschiefer, Grauwacke und Kieselschiefer (GEYER, 1895); Kieselschieferkomplex (PÖLSLER, 1969a, b); Löchriger Kalk (PÖLSLER, 1969a).

Lithology: Blackish marly shale alternating with alau shale and dark platy limestone, siliceous shale and lydites are exposed in the lower part.

Fossils: Bivalves, cephalopods, conodonts, crinoids, gastropods, graptolites, trilobites, radiolarians.

Origin, facies: Marine limestone, pelagic unit (Pelagic Carbonate Facies).

Chronostratigraphic age: Llandovery–Lochkovian (?).

Biostratigraphy: *triangulatus-bohemicus* graptolite zone (JAEGER & SCHÖNLAUB, 1977, 1980).

Thickness: 40–50 m.

Lithostratigraphically higher rank unit: Rauchkofel Nappe (or in terms of facial development: Findenig Facies, compare SCHÖNLAUB & HISTON, 1999) (all informal units).

Lithostratigraphic subdivision: -

Underlying unit(s): Plöcken Formation (unconformable contact).

Overlying unit(s): Findenig Limestone (conformable contact).

Lateral unit(s): Kok Formation; Cardiola Formation; Alticola Limestone; Megaerella Limestone; Rauchkofel Limestone; Lower Bischofalm Shale; Middle and Upper Bischofalm Shale.

Geographic distribution: Carnic Alps.

Remarks: -

Complementary references: GORTANI (1925), SCHÖNLAUB (1970, 1985a, 1991, 1998), SCHÖNLAUB & DAURER (1977), RANTITSCH (1991, 1992a), SCHÖNLAUB & KREUTZER (1994a), WENZEL (1997), VAI (1998), PASAVA & SCHÖNLAUB

(1999), SCHÖNLAUB & HISTON (2000), HUBMANN et al. (2003), SCHÖNLAUB et al. (2004), VENTURINI (2006), HISTON et al. (2007).

Untere Bischofalm-Schiefer / Lower Bischofalm Shale

THOMAS J. SUTTNER, HANS P. SCHÖNLAUB

Validity: Invalid; the graptolite bearing section at the Obere Bischofalm was discovered by STACHE (1872); the section was studied in detail by JAEGER (in FLÜGEL et al., 1977) and later by SCHÖNLAUB (1985a); important biostratigraphic studies have been performed by JAEGER & SCHÖNLAUB (1980).

Type area: ÖK50-UTM, map sheets 3108 Sillian, 3109 Oberdrauburg, 3110 Kötschach-Mauthen, 3111 Spittal an der Drau, 3116 Sonnenalpe Naßfeld (ÖK50-BMN, map sheets 196 Obertilliach, 197 Kötschach, 198 Weißbriach, 199 Hermagor).

Type section: -

Reference section(s): Area around Lake Zollner (SCHÖNLAUB, 1981), N 46°36'21" / E 13°04'17"; Obere Bischofalm (N 46°35'57" / E 13°03'11"), Feistritzgraben, Gundersheimer Alm road (Oberbuchach section), Collendiaul, Dellacher Alm, Nölblinggraben (SCHÖNLAUB, 1985a).

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

Synonyms: Graptoliten-Schiefer (STACHE, 1872); Lower Graptolitic Shales (FLÜGEL et al., 1977).

Lithology: Black alau shale and lydites, greyish green shale.

Fossils: Conodonts, graptolites.

Origin, facies: Marine siliciclastics, pelagic unit (Distal Siliciclastic Facies).

Chronostratigraphic age: Llandovery–Ludlow.

Biostratigraphy: *acuminatus–nilssoni* graptolite zones (FLÜGEL et al., 1977; JAEGER & SCHÖNLAUB, 1980).

Thickness: 10–20 m.

Lithostratigraphically higher rank unit: Bischofalm Nappe (informal).

Lithostratigraphic subdivision: -

Underlying unit(s): Bischofalm Quartzite (conformable contact).

Overlying unit(s): Middle and Upper Bischofalm Shale (conformable contact).

Lateral unit(s): Nölbling Formation.

Geographic distribution: Carnic Alps.

Remarks: -

Complementary references: HABERFELNER (1931), HERITSCH (1936), SCHÖNLAUB (1969a, 1985a, 1991, 1998), RANTITSCH (1992a), JAEGER & SCHÖNLAUB (1994), VAI (1998), SCHÖNLAUB & HISTON (2000), SCHÖNLAUB et al. (2004), VENTURINI (2006), HISTON et al. (2007).

Cardiola-Formation / Cardiola Formation

THOMAS J. SUTTNER, HANS P. SCHÖNLAUB

Validity: Invalid; first named “Cardiola-Horizont” by STACHE (1884: p. 329); later well described by GAERTNER (1931); additional biostratigraphic and sedimentological investiga-

tions were carried out by WALLISER (1964) and SCHÖNLAUB (1985a); a summary on this unit is provided by KREUTZER (1992b) and later by BRETT et al. (2009).

Type area: ÖK50-UTM, map sheets 3109 Oberdrauburg, 3110 Kötschach-Mauthen, 3116 Sonnenalpe Naßfeld, 4114 Bad Eisenkappel (ÖK50-BMN, map sheets 197 Kötschach, 212 Vellach, 213 Bad Eisenkappel).

Type section: -

Reference section(s): Cellon avalanche gully (WALLISER, 1964), N 46°36'32" / E 12°56'23"; Rauchkofel northern wall, Kellerwand, Rauchkofelboden (BRETT et al., 2009); Seeberg Aufbruch (KUPSCH et al., 1971).

Derivation of name: After the bivalve *Cardiola* (STACHE, 1884: p. 331).

Synonyms: Untersilurische Schichten [partim] (STACHE, 1874); *Cardiola*-Horizont (STACHE, 1884); Grauer Plattenkalk (FRECH, 1887); *Cardiola*-Niveau (GEYER, 1894); *Cardiola*-schichten (GEYER, 1894); Bunte Flaser- oder Bänderkalk und Kalkphyllite des Obersilur [partim] (GEYER, 1899); *Cardiolaniveau* (GAERTNER, 1931); *Cardiola*-Niveau (GAERTNER, 1931); *Cardiola* Beds (SCHÖNLAUB, 1970).

Lithology: Dark grey to black limestone with interbedded layers of marl and shale.

Fossils: Acritarchs (PRIEWALDER, 1987), bivalves (KRIZ, 1979, 1999), brachiopods (PLODOWSKI, 1971, 1973), cephalopods (RISTEDT, 1968; BOGOLEPOVA, 1998; HISTON, 1999), chitinozoans (PRIEWALDER, 1997), conodonts (WALLISER, 1964; SCHÖNLAUB, 1979), graptolites (JAEGER, 1975), radiolarians (KREUTZER, 1994), rugose corals (PICKETT, 2007), trace fossils (HISTON & SCHÖNLAUB, 1999), trilobites (HAAS, 1969).

Origin, facies: Marine limestone, pelagic unit (Plöcken Facies).

Chronostratigraphic age: Ludlow.

Biostratigraphy: *siluricus* conodont zone (WALLISER, 1964); *potens* orthocerid zone (HISTON et al., 1999).

Thickness: 0.5–4 m.

Lithostratigraphically higher rank unit: Plöcken Facies (informal).

Lithostratigraphic subdivision: -

Underlying unit(s): Kok Formation (conformable contact).

Overlying unit(s): Alticola Limestone (conformable contact).

Lateral unit(s): Nölbling Formation.

Geographic distribution: Carnic Alps (Plöcken Area), Karavanke Mountains (Seeberg area).

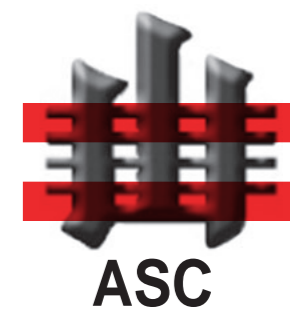
Remarks: -

Complementary references: TELLER (1886b, 1887), SPITZ (1909), HERITSCH (1929), WALLISER (1957), FLÜGEL (1965), PÖLSLER (1967), RISTEDT (1969), MANARA & VAI (1970), SCHÖNLAUB (1980b, 1985a, 1991, 1997, 1998), SIEWERT (1984), SCHÖNLAUB et al. (1997, 2004), WENZEL (1997), VAI (1998, 1999), FERRETTI et al. (1999), HISTON et al. (1999), SCHÖNLAUB & HISTON (1999, 2000), PRIEWALDER (2000), CORRADINI et al. (2003).

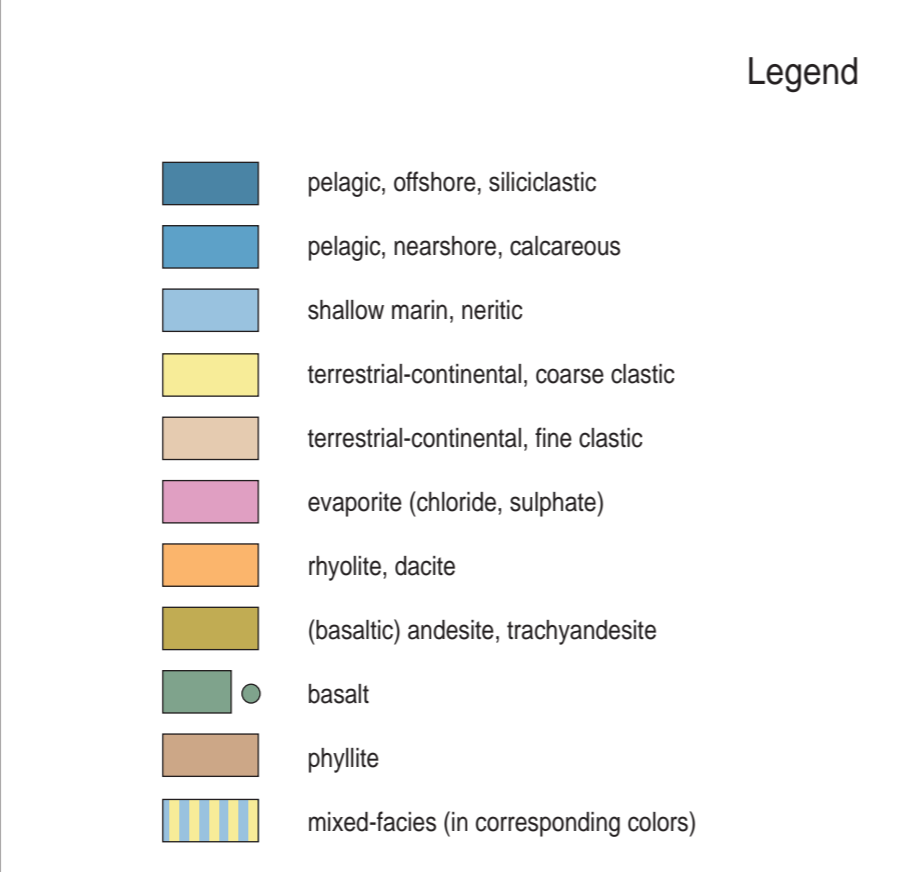
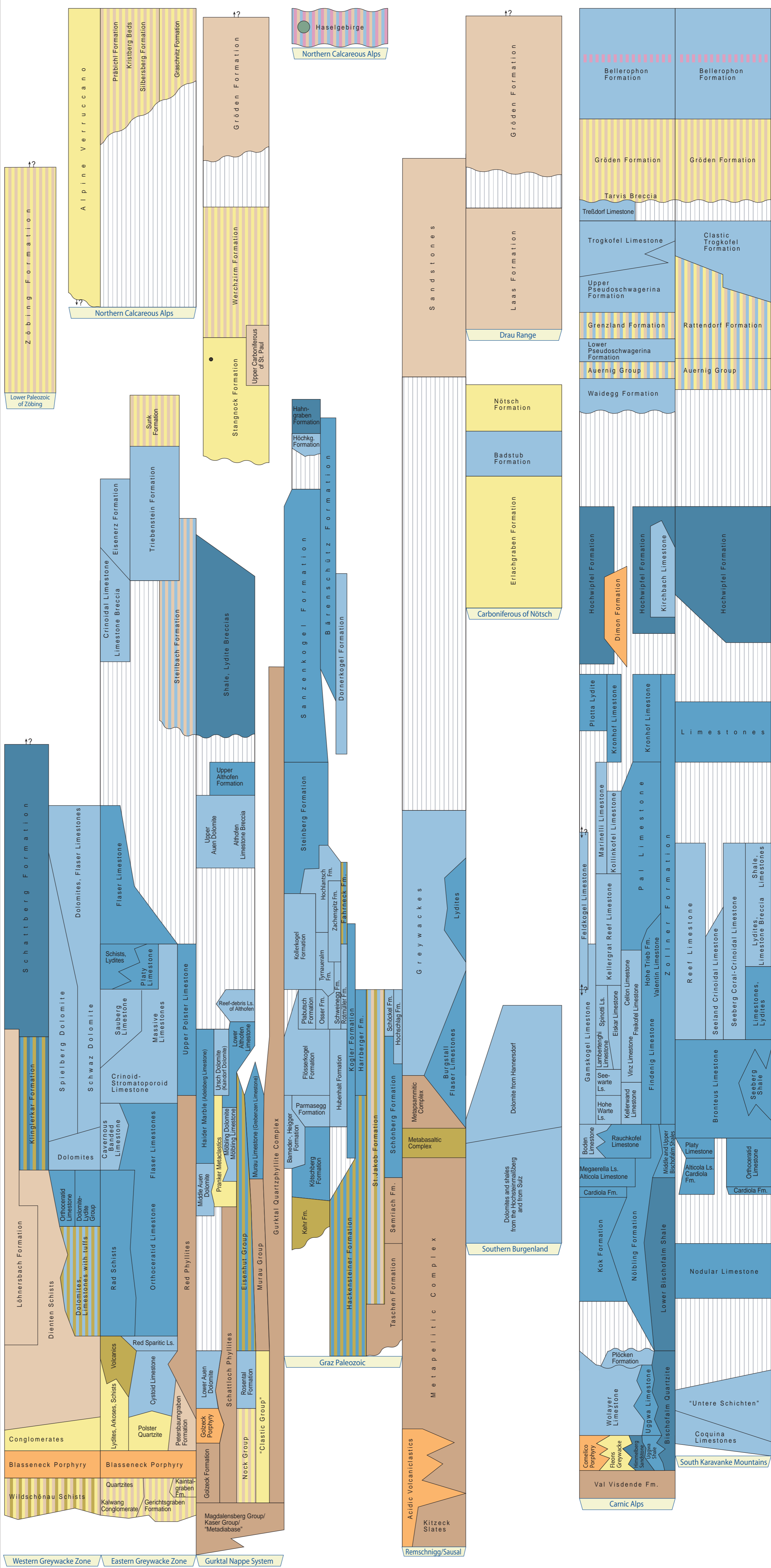
Austrian Stratigraphic Chart 2004 - Paleozoic

(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 / Dufuflian	255						
		CAPITANIAN	260						
		WORDIAN	265						
		ROADIAN	270						
		PERMIAN	LOWER PERMIAN / CISURALIAN			KUNGURIAN	275		
						ARTINSKIAN	280		
						SAKMARIAN	285		
						ASSELIAN	290		
		PERMIAN	TRIAS			GZHELIAN	295	TRIAS	U. CARBONIFEROUS / PENNSYLVANIAN
KASIMOVIAN	300								
MOSKOVIAN	305								
BASHKIRIAN	310								
PERMIAN	LOWER CARBONIFEROUS / MISSISSIPPIAN			SERPUKHOVIAN	315				
				VISEAN	320				
				TOURNAISIAN	325				
PERMIAN	DEVONIAN			FAMENNIAN	330	DEVONIAN	UPPER DEVONIAN		
				FRASNIAN	335				
				GIVETIAN	340				
		EIFELIAN	345						
		DEVONIAN	LOWER DEVONIAN	EMSIAN	350				
				PRAGIAN	355				
				LOCHKOVIAN	359.2				
		PERMIAN	DEVONIAN	LUDFORDIAN / GORSTIAN	365			DEVONIAN	MIDDLE DEVONIAN
				HOMERIAN / SHEINWOOD	370				
				TELYCHIAN	375				
AERONIAN	380								
RHUDDANIAN	385								
PERMIAN	UPPER ORDOVICIAN			HIRNANTIAN	390				
				DARRIWILIAN	395				
				TREMA-DOCIAN	400				
PERMIAN	CAMBRIAN			PAIBIAN	405	CAMBRIAN	UPPER CAMBRIAN		
				CAMBRIAN	MIDDLE CAMBRIAN				
		415							
		420							
		CAMBRIAN	LOWER CAMBRIAN	425					
				430					
				435					
				440					
		PALEOZOIC	PERMIAN	443.7	PERMIAN			LOWER PERMIAN / CISURALIAN	
				445					
450									
455									
460									
465									
470									
475									
480									
485									
488.3									
PALEOZOIC	PERMIAN	490	PERMIAN	LOWER PERMIAN / CISURALIAN					
		495							
		500							
		505							
		510							
		515							
		520							
		525							
		530							
		535							
PALEOZOIC	PERMIAN	540	PERMIAN	LOWER PERMIAN / CISURALIAN					
		542							



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

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