

Geographic distribution: Styria, highland in the surroundings of Graz; ÖK50-BMN, map sheet 164 Graz.

Remarks: -

Complementary references: EBNER (1976), EBNER & HUBMANN (2012).

Hahngraben-Formation / Hahngraben Formation

BERNHARD HUBMANN

Validity: Valid; first description by HERITSCH (1907: "Culmschiefer"); formalized by FLÜGEL (2000: p. 31–32; Hahngraben-Formation).

Type area: ÖK50-UTM, map sheet 4229 Graz (ÖK50-BMN, map sheet 164 Graz).

Type section: No type section defined, but FLÜGEL (2000) proposed a type region at Hahngraben, a trench SE of Gratkorn (east of "Alpengarten" on ÖK50-BMN, map sheet 164 Graz) (N 47°08'45" / E 15°22'44") approx. 15 km northwest of Graz.

Reference section(s): -

Derivation of name: After the valley Hahngraben north of Dult, approx. 15 km northwest of Graz.

Synonyms: Culmschiefer (HERITSCH, 1907); Tonschiefergruppe (CLAR, 1933); Dultschiefer (EBNER, 1975a); Schichten der Dult (H. FLÜGEL, 1975; EBNER, 1978a).

Lithology: Black to grey-green argillaceous shales sometimes intercalated by silt- to sandstones with reworked lydites.

Fossils: Very rare plant remains of very bad preservation.

Origin, facies: Presumably a slightly deeper marine depositional environment; ?distal turbidites.

Chronostratigraphic age: Age is unknown due to the lack of age diagnostic fossils. However, an upper Bashkirian or even younger age is possible (EBNER & HUBMANN, 2012).

Biostratigraphy: -

Thickness: More than 50 m.

Lithostratigraphically higher rank unit: Dult Group.

Lithostratigraphic subdivision: -

Underlying unit(s): Höchkogel Formation.

Overlying unit(s): -

Lateral unit(s): -

Geographic distribution: Styria, highland in the surroundings of Graz; ÖK50-BMN, map sheet 164 Graz.

Remarks: CLAR (1933) assumed a Silurian age of the succession because of its lithologic characteristics (mica-rich shales and lydites) albeit HERITSCH (1930b) described a single specimen of "*Calamites* sp. ex gr. *C. goepperti*" (which is lost!).

Complementary references: EBNER (1976, 1998), EBNER et al. (2000).

Remschnigg/Sausal / Remschnigg and Sausal areas

The underground of the Neogene basins in Western and Eastern Styria and South Burgenland is visible on some isolated swells. Most prominent are the Sausal region, the Remschnigg-Poßruck at the Styrian border to Slovenia, some isolated outcrops at the Austrian-Hungarian-Slovenian border triangle in the vicinity of St. Anna am Aigen and Rotterberg/Stadelberg and the isolated hills of Kohfidisch, Hannersdorf and Kirchfidisch (GROSS et al., 2007).

The uplift at the Sausal area and Remschnigg is linked to the "Middle Styrian Swell" [Mittelsteirische Schwelle].

Information is generally very limited since outcrops are isolated and tectonically cut and internally intensively fractured and folded; complete sequences are unknown. The monotonous, fossil-poor rocks suffered at least from green schist metamorphism thus hampering a comparison with successions of the Graz Paleozoic.

In the Sausal area acidic volcanites are interpreted as Late Ordovician in analogy to the Greywacke Zone. Sandy to clayey slates with occasionally interbedded green schists and diabases (carbonate rocks are very subordinate) probably may have a Silurian to Devonian age. At Burgstall-Grillkogel flaserlimestones and crinoidal limestones of Lochkuvian to Pragian age are tectonically overlying (SCHLAMBERGER, 1987).

In the Remschnigg and Poßruck areas at the Austrian border to Slovenia, although extremely badly outcropping, a lithologically very variable sequence (not shown in the ASC 2004) is known (WINKLER-HERMADEN, 1933). Similarities in the stratigraphic sequence and tectonic development resemble the situation in the Gurktal Nappe System

(EBNER, 1987). Phyllites and diabases occur in a lower tectonic unit, which may be compared with the Murau Nappe. In the higher nappe ("Stolzalpe Nappe") the sequence includes mafic volcanoclastics (greenschists, diabases, violet tuffs), argillaceous schists, crinoidal limestones containing brachiopods and tabulate corals (HERITSCH, 1933b) and flaser limestones. Conodonts of the limestones indicate Llandovery to Late Devonian ages (EBNER, 1975b).

In contrast to the Graz Paleozoic where sedimentation younger than late Carboniferous is not recorded, red sandstones and conglomerates are developed in the Remschnigg/Poßruck area which might be Permian in age. From isolated locations, which lack contacts to other rocks, quartzitic sandstones and argillaceous shales, marls and platy limestones with remains of *Cidaris* are known. The former rocks are interpreted as equivalents of the Werfen Formation (Lower Triassic); the latter are similar with sediments of the "Raibl level" (Carnian). The succeeding dolomites and cellular dolomites possibly represent the Norian "Hauptdolomit". The succession is terminated by Upper Cretaceous limestones containing rudists and marls with coccoliths (FLÜGEL & NEUBAUER, 1984).

Saure Vulkanoklastika / Acidic Volcanoclastics

BERNHARD HUBMANN

Validity: Invalid; comprehensive description by SCHLAMBERGER (1987: p. 4; "Saurer Vulkanitkomplex").

Type area: ÖK50-UTM, map sheet 4111 Leibnitz (ÖK50-BMN, map sheet 190 Leibnitz).

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	TRIAS			GZHELIAN	295	TRIAS	U. CARBONIFEROUS / PENNSYLVANIAN
KASIMOVIAN	300								
MOSKOVIAN	305								
BASHKIRIAN	310								
TRIAS	LOWER CARBONIFEROUS / MISSISSIPPIAN			SERPUKHOVIAN	315				
				VISEAN	320				
				TOURNAISIAN	325				
PERMIAN	DEVONIAN			FAMENNIAN	350	DEVONIAN	UPPER DEVONIAN		
				FRASNIAN	355				
				GIVETIAN	360				
		EIFELIAN	365						
		DEVONIAN	LOWER DEVONIAN	EMSIAN	370				
				LOCHKOVIAN	375				
		PERMIAN	DEVONIAN	LUDFORDIAN / GORSTIAN	380			DEVONIAN	MIDDLE DEVONIAN
				HOMERIAN / SHEINWOOD	385				
				TELYCHIAN	390				
				AERONIAN	395				
RHUDDANIAN	400								
DEVONIAN	UPPER ORDOVICIAN			DARRIWILIAN	405				
				TREMA-DOCIAN	410				
PERMIAN	DEVONIAN			WEN-LUD-LOCK / LOW	415	DEVONIAN	LOWER DEVONIAN		
				HORNBLAND / SHEINWOOD	420				
				TELYCHIAN	425				
		AERONIAN	430						
		RHUDDANIAN	435						
		DEVONIAN	UPPER ORDOVICIAN	DARRIWILIAN	440				
				TREMA-DOCIAN	445				
		PERMIAN	DEVONIAN	WEN-LUD-LOCK / LOW	450			DEVONIAN	LOWER DEVONIAN
				HORNBLAND / SHEINWOOD	455				
				TELYCHIAN	460				
AERONIAN	465								
RHUDDANIAN	470								
DEVONIAN	UPPER ORDOVICIAN			DARRIWILIAN	475				
				TREMA-DOCIAN	480				
PERMIAN	DEVONIAN			WEN-LUD-LOCK / LOW	485	DEVONIAN	LOWER DEVONIAN		
				HORNBLAND / SHEINWOOD	490				
				TELYCHIAN	495				
		AERONIAN	500						
		RHUDDANIAN	505						
		DEVONIAN	UPPER ORDOVICIAN	DARRIWILIAN	510				
				TREMA-DOCIAN	515				
		PERMIAN	DEVONIAN	WEN-LUD-LOCK / LOW	520			DEVONIAN	LOWER DEVONIAN
				HORNBLAND / SHEINWOOD	525				
				TELYCHIAN	530				
AERONIAN	535								
RHUDDANIAN	540								
DEVONIAN	UPPER ORDOVICIAN			DARRIWILIAN	545				
				TREMA-DOCIAN	550				



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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