

**Synonyms:** Upper part of the Nötschgraben-Gruppe and Pölland-Gruppe in FLÜGEL & KODSI (1968) and KODSI & FLÜGEL (1970).

**Lithology:** Clastic sequence of greyish shales, mudstones, siltstones, sandstones and medium to coarse grained conglomerates.

**Fossils:** Trilobites, rugose corals, brachiopods, goniatites, nautiloids, gastropods, crinoids, echinoids, ophiocistoids, bryozoans, phyllocarids, arachnids (spiders), monoplacophores, serpulids, plants (see SCHRAUT, 1999).

**Origin, facies:** Shallow marin, below storm wave base.

**Chronostratigraphic age:** Serpukhovian.

**Biostratigraphy:** Based on corals and plants (*Lepidophyta*, *Calamites*).

**Thickness:** 400–600 m.

**Lithostratigraphically higher rank unit:** -

**Lithostratigraphic subdivision:** -

**Underlying unit(s):** Badstub Formation.

**Overlying unit(s):** Gröden Formation (?). The contact between the two units is, however, not exposed.

**Lateral unit(s):** -

**Geographic distribution:** Northern side of Gail Valley between Windische Höhe in the west and Mount Dobratsch (Villacher Alpe) in the east (see map by SCHÖNLAUB, 1985d).

**Remarks:** -

**Complementary references:** -

## Drauzug / Drau Range

The base of the Mesozoic Drau Range is composed of late to post-Variscan sediments of early to late Permian ages. These sediments reach up some 500 m in thickness and overlie unconformably different types of metamorphic rocks ("Gailtalkristallin"). The sedimentary sequence is characterized by molasse-type sediments deposited in intermontane basins which were formed by block and wrench faulting during the late orogenic stage of the Variscan cycle. The Permian sedimentation took place under increasingly semiarid to arid climatic conditions; the sudden alteration in sedimentation (Alpine Buntsandstein), obviously caused by a climatic change presumably represents the Permian/Triassic boundary (KRAINER, 1993c).

### Laas-Formation / Laas Formation

HANS P. SCHÖNLAUB

**Validity:** Valid; first denomination and formalized by NIEDERMAYR & SCHERIAU-NIEDERMAYR (1982: p. 35–40).

**Type area:** ÖK50-UTM, map sheet 3110 Kötschach-Mauthen (ÖK50-BMN, map sheet 197 Kötschach), Carinthia, between Gailberg Pass and Maiengraben near the village of St. Daniel.

**Type section:** N 45°41'39" / E 13°00'57". Northeast of the small village of Lanz (1,038 m) NNE of Kötschach at an altitude of 1,300 m along the forest road from Lanz to Stelzling Hütte (NIEDERMAYR & SCHERIAU-NIEDERMAYR, 1982: p. 37; KRAINER, 1990b: p. 64)

**Reference section(s):** Tiebelgraben, Riedgraben between the villages Paternion and Stockenboi (KRAINER, 1990b) on ÖK50-BMN, map sheets 199 Hermagor, 200 Arnoldstein.

**Derivation of name:** Named after the village of Laas northwest of Kötschach-Mauthen.

**Synonyms:** Postvariszische Transgressionsserie, Liegende Serie, Serie von Laas, Laaser Schichten, Kontinentaldetritisches Perm, Freudenberg Schichten (RIEHL-HERWIRSCH, 1965, 1972; NIEDERMAYR, 1975; NIEDERMAYR & SCHERIAU-NIEDERMAYR, 1982; KRAINER, 1985, 1990b, 1993b).

**Lithology:** Conglomerates, breccias, red and grey sandstones and siltstones.

**Fossils:** Plants, ostracods, *Spirorbis*, fish scales, tetrapod imprints (*Ichniotherium cottae*), root and soil horizons, plants.

**Origin, facies:** Clastic proximal to distal alluvial fan deposits intercalated with highly bioturbated playa-sediments and up to 80 m thick rhyolitic pyroclastics (ash flow tuffs, ignimbrites) in the upper part.

**Chronostratigraphic age:** Asselian (Lower Permian).

**Biostratigraphy:** *callipteris conferta* Zone.

**Thickness:** Up to 150 meters.

**Lithostratigraphically higher rank unit:** -

**Lithostratigraphic subdivision:** -

**Underlying unit(s):** Gailtal Crystalline Complex.

**Overlying unit(s):** Coarse clastics of the Gröden Formation.

**Lateral unit(s):** -

**Geographic distribution:** Northern side of Gail Valley overlying the Gailtal Crystalline Complex in the surroundings north of Kötschach-Mauthen (see map by SCHÖNLAUB, 1985c) as well as on the northern side of the Gailtal Alps (Drauzug).

**Remarks:** -

**Complementary references:** -

### Gröden-Formation / Gröden Formation

(see also description in Carnic Alps)

HANS P. SCHÖNLAUB

**Validity:** See entry Gröden Formation in Carnic Alps.

**Type area:** See entry Gröden Formation in Carnic Alps.

**Type section:** See entry Gröden Formation in Carnic Alps.

**Reference section(s):** See entry Gröden Formation in Carnic Alps.

**Derivation of name:** See entry Gröden Formation in Carnic Alps.

**Synonyms:** See entry Gröden Formation in Carnic Alps.

**Lithology:** Coarse clastic sequence of conglomerates interbedded with red-colored sandstones interpreted as alluvial fan sequence of a braided river system in an semi-arid to arid climate. The red color is derived from finely dispersed hematite. Locally, in the middle part magnesite and dolomite bearing sand- and siltstones occur containing caliche crusts and playa sediments indicating a temporal evaporitic environment.

**Fossils:** In the lower part of the section fossil trees are intercalated in the basal portion identified as *Dadoxylon schrollianum*; also, spores have rarely been found.

**Origin, facies:** See entry Gröden Formation in Carnic Alps.

**Chronostratigraphic age:** Late Middle Permian due to reworked pebbles of quartzporphyritic composition presumably derived from the Bozen Quartzporphyry of the Dolomites.

**Biostratigraphy:** -

**Thickness:** Up to 350 meters.

**Lithostratigraphically higher rank unit:** -

**Lithostratigraphic subdivision:** -

**Underlying unit(s):** Laas Formation and Gailtal Crystalline Complex, respectively.

**Overlying unit(s):** Alpinen Buntsandstein and Werfen Formation of the Triassic sequence.

**Lateral unit(s):** -

**Geographic distribution:** In the Gailtal Alps and Lienz Dolomites ("Drauzug").

**Remarks:** -

**Complementary references:** -

## Nördliche Kalkalpen / Northern Calcareous Alps

The thick Mesozoic sequences of the Northern Calcareous Alps are resting on predominantly clastic (Upper) Permian sediments. A primary (transgressive) contact to the underlying Greywacke Zone (e.g., Leobner Hut area near Eisenerz) is only rarely known due to overprint by Alpidic tectonic movements. In some cases a coherent connection between Permian "continental detritic" deposits and a Mesozoic cover is not traceable since they feature tectonic hangingwall boundaries (e.g., Silbersberg Nappes in NE Styria and Lower Austria, and Veitsch Nappe south of the Mürz Valley; NEUBAUER et al., 1994).

### Alpinen Verrucano / Alpine Verrucano

HANS P. SCHÖNLAUB

**Validity:** Invalid.

**Remarks:** The term "Alpinen Verrucano" was introduced by TOLLMANN (1962). TOLLMANN (1972: p. 83) defined this unit as coarse to fine detritic, weakly bedded continental Permian series deposited in an arid climate at the onset of the Alpine sedimentary cycle. Interbedded are acid volcanics and its debris. According to TOLLMANN (1972) and RIEHL-HERWIRSCH (1972) the "Alpinen Verrucano" should not be mixed with the "Verrucano Alpino" of ACCORDI (1956) which is restricted to the Lower Permian conglomerates overlying the Variscan sequence. Hence, RIEHL-HERWIRSCH (1972: p. 104) suggested to abandon this name and not to use it in further descriptions of tentatively similar rock sequences.

**Type area:** Not defined.

**Type section:** No type section defined.

**Reference section(s):** -

**Derivation of name:** After Castell Verruca in the Monte Pisani area (Tuscany/Italy).

**Synonyms:** -

**Lithology:** Mainly red, partly green, grey or brown coarse to fine grained conglomerates, sandstones and volcaniclastics.

**Fossils:** Rare and very badly preserved plant remains.

**Origin, facies:** Continental redbeds.

**Chronostratigraphic age:** Permian.

**Biostratigraphy:** -

**Thickness:** Up to 1,000 m.

**Lithostratigraphically higher rank unit:** -

**Lithostratigraphic subdivision:** -

**Underlying unit(s):** Various units of the Variscan Alpine sequence.

**Overlying unit(s):** Triassic sequences of the Northern Calcareous Alps.

**Lateral unit(s):** -

**Geographic distribution:** The Alpine Verrucano occurs at the base of the Alpine orogenic cycle within the Austroalpine nappe system.

**Remarks:** -

**Complementary references:** -

### Präbichl-Formation / Präbichl Formation

HANS P. SCHÖNLAUB

**Validity:** Invalid; the term was introduced by SCHWINNER (1929) for the clastic post-Variscan cover overlying Devonian limestones between Leobner Hütte (1,582 m) and the mountain Polster (1,910 m) northeast of Präbichl Pass, Styria, at the base of the Northern Calcareous Alps.

**Type area:** ÖK50-UTM, map sheet 4215 Eisenerz (ÖK50-BMN, map sheet 101 Eisenerz), area between Polster Kar, Leobner Hütte and peak of Polster northeast of Präbichl Pass, Styria.

**Type section:** Northeastern directed section between "Knappensteig" west of Leobner Hütte and Hirschegg Sattel (1699 m) (N 47°32'00" / E 14°58'14").

**Reference section(s):** -

**Derivation of name:** After Präbichl Pass (1,226 m) in the Eisenerz Alps (Styria).

**Synonyms:** Prebichlschichten, Präbichlkonglomerat (SCHWINNER, 1929; CORNELIUS, 1936); Werfener Basisbrekzie (HIESSLEITNER, 1931, 1935); Basiskonglomerat der Werfener Schichten (HABERFELNER, 1935); Präbichlschichten (KRAINER & STINGL, 1986).

**Lithology:** Generally, the predominantly red clastic sequence starts with an up to 50 m thick limestone conglomerate containing pebbles from the underlying strata (limestones, siderite, ankerite). This basal conglomerate and breccia is succeeded by interbedded lenses of quartz-rich conglomerates and pink siltstones which grade into more than 50 m thick sandstones alternating with mudstones and siltstones (SOMMER, 1972). In the quartz-rich conglomerate chert clasts occur quite frequently and are derived from the reworked Devonian to Carboniferous sequence

# 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	380	PERMIAN	UPPER DEVONIAN				
		FRASNIAN	385						
		GIVETIAN	390						
		EIFELIAN	395						
		DEVONIAN	LOWER DEVONIAN			EMSIAN	400		
						405			
		PRAGIAN	410						
		LOCHKOVIAN	415						
		PERMIAN	LOWER DEVONIAN			LUDFORDIAN / GORSTIAN	420	PERMIAN	LOWER DEVONIAN
						HOMERIAN / SHEINWOOD	425		
TELYCHIAN	430								
AERONIAN	435								
RHUDDANIAN	440								
HIRNANTIAN	443.7								
445									
450									
455									
460									
PERMIAN	UPPER ORDOVICIAN	DARRIWILIAN	465	PERMIAN	UPPER ORDOVICIAN				
		470							
		475							
		480							
		485							
		488.3							
		490							
		495							
		500							
		PERMIAN	MIDDLE CAMBRIAN			PAIBIAN	505	PERMIAN	MIDDLE CAMBRIAN
510									
515									
520									
525									
530									
535									
540									
542									
CAMBRIAN	LOWER CAMBRIAN			545	CAMBRIAN	LOWER CAMBRIAN			
		550							
		555							
		560							
		565							
		570							
		575							
		580							
		585							
		590							



- 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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