

# Nölbling Formation

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Österreichische Karte 1:50.000

Blatt BMN 197 Kötschach

Blatt BMN 198 Weißbriach

Blatt BMN 199 Hermagor

Carta Topografica d'Italia 1:50.000

Foglio 018 Passo di Monte Croce Carnico

Foglio 032 Tolmezzo

Foglio 033 Tarvisio

Blatt UTM 3110 Kötschach-Mauthen

Blatt UTM 3116 Sonnenalpe Naßfeld

Blatt UTM 3117 Nötsch im Gailtal

## Definition

Alternating argillaceous-calcareous sequence of graphitic sandstone, lydite, black shale, dark platy limestone (wackestone-packstone).

## Description

The Nölbling Formation consists dominantly of dark, organic-rich and pyritic shales, but with nodular cephalopod bearing limestones at several horizons in the Wenlock and especially in the Ludlow portions of the section. Thin tabular black chert bands (lydites) and pyritic and quartz-rich sandstones are documented.

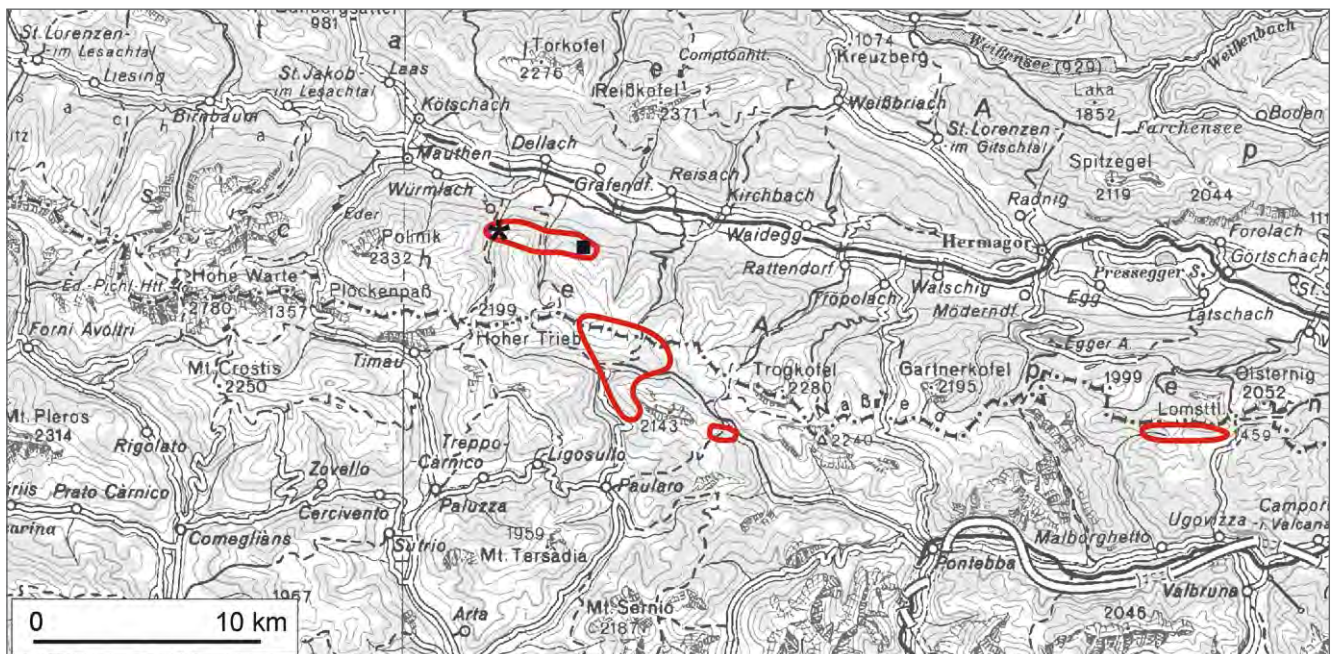
Outcrops are often affected by tectonics that prevents in many cases definition of original thickness.

## Fossil content

Bivalves, brachiopods, cephalopods, conodonts, crinoids, gastropods, graptolites, ostracods, radiolarians, sponge spicules, trilobites.

## Depositional environment

Moderately deep shelf to basinal.



Main areal distribution of the Nölbling Formation with indication of the stratotype (asterisk) and of the reference section (square).



The Nöblinggraben Section. a) lithostratigraphic column of the section (redrawn from JAEGER & SCHÖNLAUB, 1977); b) close view of the Nöbling Formation exposed in the Nöblinggraben Section (photo H.P. SCHÖNLAUB).

## Stratotype

Nöblinggraben Section (JAEGER & SCHÖNLAUB, 1977), located at coordinates N 46°38'14", E 13°05'04".

## Reference sections

Oberbuchach I Section (JAEGER & SCHÖNLAUB, 1980), located at coordinates N 46°37'38", E 13°06'31", for the good quality of the outcrop with both conodont and graptolites.

## Type area

Central Carnic Alps.

## Main outcrop areas

The area between Nöblinggraben and La Valute; road from Gundersheim to Gundersheim Alm, Mt. Findenig, Mt. Pizzul and north Mt. Cocco areas.

## Thickness

About 50 m.

## Boundaries

*Underlying units* – Plöcken Formation (?) (unconformable contact).

*Overlying units* – Findenig Formation (conformable contact).

*Lateral units* – Kok Formation, Cardiola Formation, Alticola Formation, Bischofalm Formation, Rauchkofel Formation.

## Derivation of name

After the village of Nöbling (Austria).



Views of the Nölbling Formation in the field: a) global view of the Nölbling Formation exposed in the Oberbuchach I Section (photo H.P. SCHÖNLAUB); b) detail of the unit exposed at the Rio Malinfier West Section (photo C. CORRADINI).

## Synonymy

Complex von Tonschiefer, Grauwacke und Kieselschiefer: GEYER (1895).

Scisti a graptoliti: TARAMELLI (1895a, b).

Gotlandiano: facies scistosa: GORTANI (1926).

Siluriano superiore. Scisti neri grafitici o selcioso grafitici: GORTANI & DESIO (1927).

Kieselschiefer mit Kalken und Lyditen: JAEGER & PÖLSLER (1968).

Calcari e marne nere alternati, talora con argilliti ai Graptoliti; calcari rossicci o nerastri ad "Orthoceras", calcari nodulari: ASSERETO et al. (1968).

Calcari chiari a Crinoidi; marne brune e argilliti nere: ASSERETO et al. (1968).

Kieselschieferkomplex: PÖLSLER (1969a, b).

Löchriger Kalk: PÖLSLER (1969a).

Nölbling Formation: SCHÖNLAUB (1985).

Argilliti a Graptoliti con intercalazioni calcaree: VAI (1971).

Argilliti a graptoliti e radiolariti [partim]: SPALLETTA et al. (1982).

Graptolitic shales [partim]: SPALLETTA & VENTURINI (1989).

Formation di Nölbling: VENTURINI (2006).

Graptolite shale [partim]: BRIME et al. (2008).

## Chronostratigraphic age

Silurian – Devonian: Rhuddanian to upper Lochkovian.

## Biostratigraphy

*Conodonts.* – *Pterospiriferus amorphognathoides angulatus* Zone (JAEGER & SCHÖNLAUB, 1977) to *A. transitans* Zone (CORRIGA et al., 2012).

*Graptolites.* – *Cystograptus vesiculosus* Zone (JAEGER & SCHÖNLAUB, 1977; ŠTORCH & SCHÖNLAUB, 2012) to *Monograptus hercynicus* Zone (JAEGER & SCHÖNLAUB, 1980).

## Complementary references

*Sequence stratigraphy.* – BRETT et al. (2007, 2009).

*Geochemistry.* – PASAVA & SCHÖNLAUB (1999).

*Isotopes.* – WENZEL (1997).

## Remarks

Several K-bentonite levels were described and discussed by HISTON et al. (2007). Reflectance on graptolites was performed by RANTITSCH (1992).

## References

- ASSERETO, R., DESIO, A., DI COLBERTALDO, D. & PASSERI, L.D. (1968): Note illustrative della Carta Geologica d'Italia alla scala 1-100.000. Foglio 14A Tarvisio. Ministero dell'Industria, del Commercio e dell'Artigianato. Direzione Generale delle Miniere. – Servizio Geologico d'Italia, 1–70, Ercolano.
- BRETT, C., FERRETTI, A., HISTON, K. & SCHÖNLAUB, H.P. (2007): Eustasy and Basin Dynamics of the Silurian of the Carnic Alps (Austria). – Yangtze Conference on Ordovician and Silurian (June, 2007). Nanjing, China, 27 - 30 June 2007, *Acta Palaeontologica Sinica*, **46** (Suppl.), 43–49, Beijing.
- BRETT, C., FERRETTI, A., HISTON, K. & SCHÖNLAUB, H.P. (2009): Silurian Sequence Stratigraphy of the Carnic Alps, Austria. – *Palaeogeography, Palaeoclimatology, Palaeoecology*, **279**/1–2, 1–28, Amsterdam.
- BRIME, C., PERRI, M.C., PONDRELLI, M., SPALLETTA, C. & VENTURINI, C. (2008): Polyphase metamorphism in the eastern Carnic Alps (N Italy-S Austria): Clay minerals and conodont Colour Alteration Index evidence. – *International Journal of Earth Sciences*, **97**/6, 1213–1229, Berlin-Heidelberg.
- CORRIGA, M.G., CORRADINI, C., PONDRELLI, M. & SIMONETTO, L. (2012): Lochkovian (Lower Devonian) conodonts from the Rio Malinfier section (Carnic Alps, Italy). – *Gortania Geologia, Paleontologia, Paleontologia*, **33**, 31–38, Udine.
- GEYER, G. (1895): Ein neues Vorkommen fossilführender Silurbildungen in den Karnischen Alpen. – *Verhandlungen der kaiserlich-königlichen Geologischen Reichsanstalt*, **1895**, 308, Wien.
- GORTANI, M. (1926): Guida geologica del Friuli. Parte generale. – Stabilimento Tipografico Carnia, 64 p., Tolmezzo.
- GORTANI, M. & DESIO, A. (1927): Note illustrative della carta geologica delle Tre Venezie. Foglio "Pontebba". – Ministero dei Lavori Pubblici. Ufficio Idrografico del Regio Magistrato alle Acque. Sezione Geologica, 86 p., Padova.
- HISTON, K., KLEIN, P., SCHÖNLAUB, H.P. & HUFF, W.D. (2007): Lower Paleozoic K-bentonites from the Carnic Alps, Austria. – *Mitteilungen der Österreichischen Geologischen Gesellschaft*, **100**, 26–42, Wien.
- JAEGER, H. & PÖLSLER, P. (1968): Bericht über die geologische Aufnahme des Findenigkofels (Monte Lodin) in den Karnischen Alpen (Kärnten). – *Anzeiger der Österreichischen Akademie der Wissenschaften, naturwissenschaftliche Klasse*, **1968**, 149–155, Wien.
- JAEGER, H. & SCHÖNLAUB, H.P. (1977): Das Ordoviz/Silur-Profil im Nöblinggraben (Karnische Alpen, Österreich). – *Verhandlungen der Geologischen Bundesanstalt*, **1977**, 349–359, Wien.
- JAEGER, H. & SCHÖNLAUB, H.P. (1980): Silur und Devon nördlich der Gundersheimer Alm in den Karnischen Alpen (Österreich). – *Carinthia II*, **170**/90, 403–444, Klagenfurt.
- PASAVA, J. & SCHÖNLAUB, H.P. (1999): Stratigraphy, geochemistry and origin of Silurian black graptolitic shales of the Carnic Alps (Austria). – In: LOBITZER, H. & GRECULA, P. (eds.): *Geologie ohne Grenzen - Festschrift 150 Jahre Geologische Bundesanstalt*. – *Abhandlungen der Geologischen Bundesanstalt*, **56**/1, 317–324, Wien.
- PÖLSLER, P. (1969a): Stratigraphie und Tektonik im Nordabfall des Findenigkofels (Silur bis Karbon; Karnische Alpen, Österreich). – *Jahrbuch der Geologischen Bundesanstalt*, **112**, 355–398, Wien.
- PÖLSLER, P. (1969b): Conodonten aus dem Devon der Karnischen Alpen (Findenigkofel, Österreich). – *Jahrbuch der Geologischen Bundesanstalt*, **112**/2, 399–440, Wien.
- RANTITSCH, G. (1992): Reflexionsmessungen an Graptolithen im Silur und Unterdevon der Karnischen Alpen (Österreich). – *Jahrbuch der Geologischen Bundesanstalt*, **135**, 299–316, Wien.
- SCHÖNLAUB, H.P. (1985): Das Paläozoikum der Karnischen Alpen. – In: SCHÖNLAUB, H.P. (ed.): *Arbeitstagung der Geologischen Bundesanstalt 1985 Kötschach-Mauthen, Gailtal* – *Geologische Bundesanstalt*, 34–52, Wien.
- SPALLETTA, C. & VENTURINI, C. (1989): Stratigraphic correlation form of the Paleozoic sequence in the Carnic Alps (Italy). – *Rendiconti della Società Geologica Italiana*, **12**, 412–421, Roma.
- SPALLETTA, C., VAI, G.B. & VENTURINI, C. (1982): La Catena Paleocarnica. – In: CASTELLARIN, A. & VAI, G.B. (eds.): *Guida alla geologia del Sudalpino centro-orientale*. – *Guide Geologiche Regionali, Società Geologica Italiana*, 281–292, Bologna.
- ŠTORCH, P. & SCHÖNLAUB, H.P. (2012): Ordovician-Silurian boundary graptolites of the Southern Alps, Austria. – *Bulletin of Geosciences*, **87**/3, 755–766, Prague.
- TARAMELLI, T. (1895a): Osservazioni stratigrafiche sui terreni paleozoici nel versante italiano delle Alpi Carniche. – *Rendiconti della Reale Accademia dei Lincei*, s. **5**, 4, 185–193, Roma.
- TARAMELLI, T. (1895b): Osservazioni sul Paleozoico delle Alpi Carniche. – *Bollettino della Società Geologica Italiana*, **14**/2, 277–280, Roma.
- VAI, G.B. (1971): Diskussionsbeitrag zu den Vorträgen über das "Variszikum der Ostalpen". – *Zeitschrift der Deutschen geologischen Gesellschaft*, **122**, 169–172, Stuttgart.
- VENTURINI, C. (2006): Evoluzione geologica delle Alpi Carniche. – *Edizioni del Museo Friulano di Storia Naturale*, **48**, 208 p., Udine.
- WENZEL, B. (1997): Isotopenstratigraphische Untersuchungen an silurischen Abfolgen und deren paläozeanographische Interpretation. – *Erlanger geologische Abhandlungen*, **129**, 1–117, Erlangen.

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