

# Hoher Trieb Formation

MONICA PONDRELLI, HANS-PETER SCHÖNLAUB, CARLO CORRADINI, CLAUDIA SPALLETTA, THOMAS J. SUTTNER,  
ERIKA KIDO, MARIA CRISTINA PERRI, LUCA SIMONETTO, MARIA G. CORRIGA, ANGELO MOSSONI,  
SUSANNE M.L. POHLER & HEIKO HÜNEKE

Österreichische Karte 1:50.000

Blatt BMN 197 Kötschach

Blatt BMN 198 Weißbriach

Blatt BMN 199 Hermagor

Blatt UTM 3109 Oberdrauburg

Blatt UTM 3110 Kötschach-Mauthen

Blatt UTM 3116 Sonnenalpe Naßfeld

Blatt UTM 3117 Nötsch im Gailtal

Carta Topografica d'Italia 1:50.000

Foglio 018 Passo di Monte Croce Carnico

Foglio 031 Ampezzo

Foglio 032 Tolmezzo

Foglio 033 Tarvisio

## Definition

Well-bedded pack-/grainstone and float-/rudstone, wackestone, cherts and laminated black shales (SELLI, 1963a; PÖLSLER, 1969; SCHÖNLAUB, 1969, 1980, 1985a, b; KREUTZER, 1992a, b; HUBMANN et al., 2003; SPALLETTA & PONDRELLI, 2009; KIDO et al., 2011a, b, c; PONDRELLI et al., 2015).

## Description

The Hoher Trieb Formation consists of five well-bedded facies listed below:

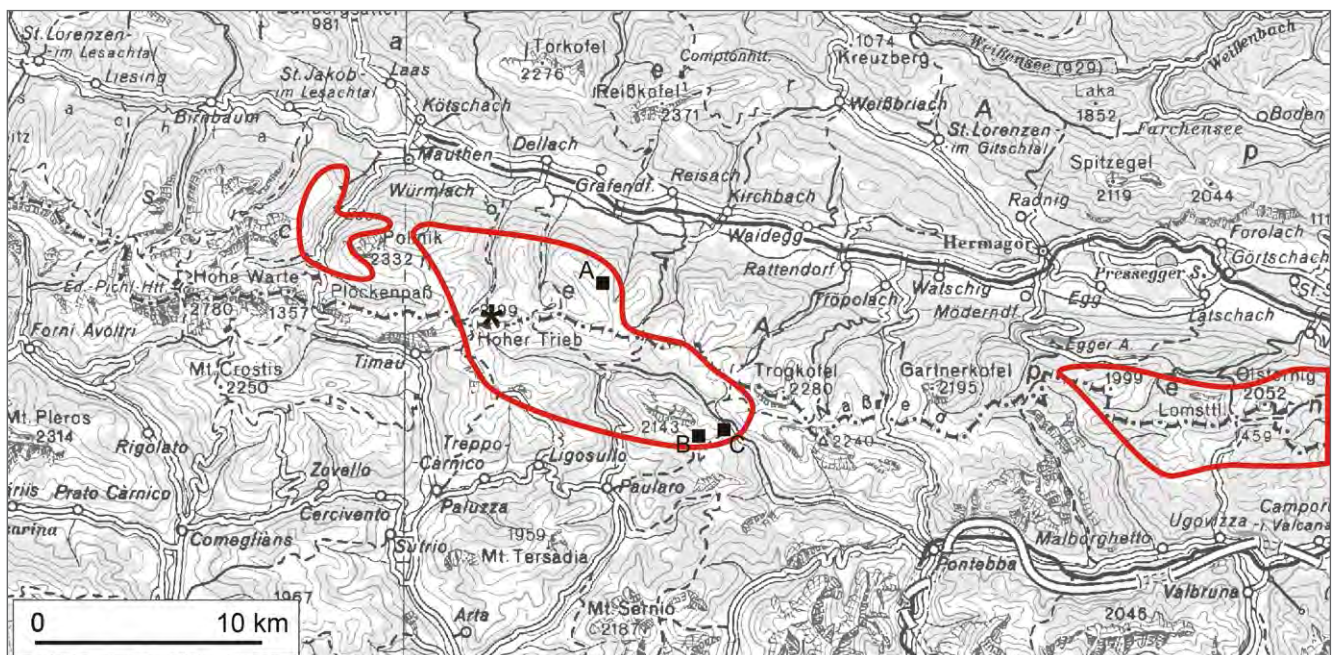
Facies A: medium dark gray very thick-bedded rudstone and floatstone; matrix consists mainly of grainstone; silicified corals are common among the clasts;

Facies B: medium dark gray thin to thick-bedded pack-/grainstone locally showing evidence of tractive structures;

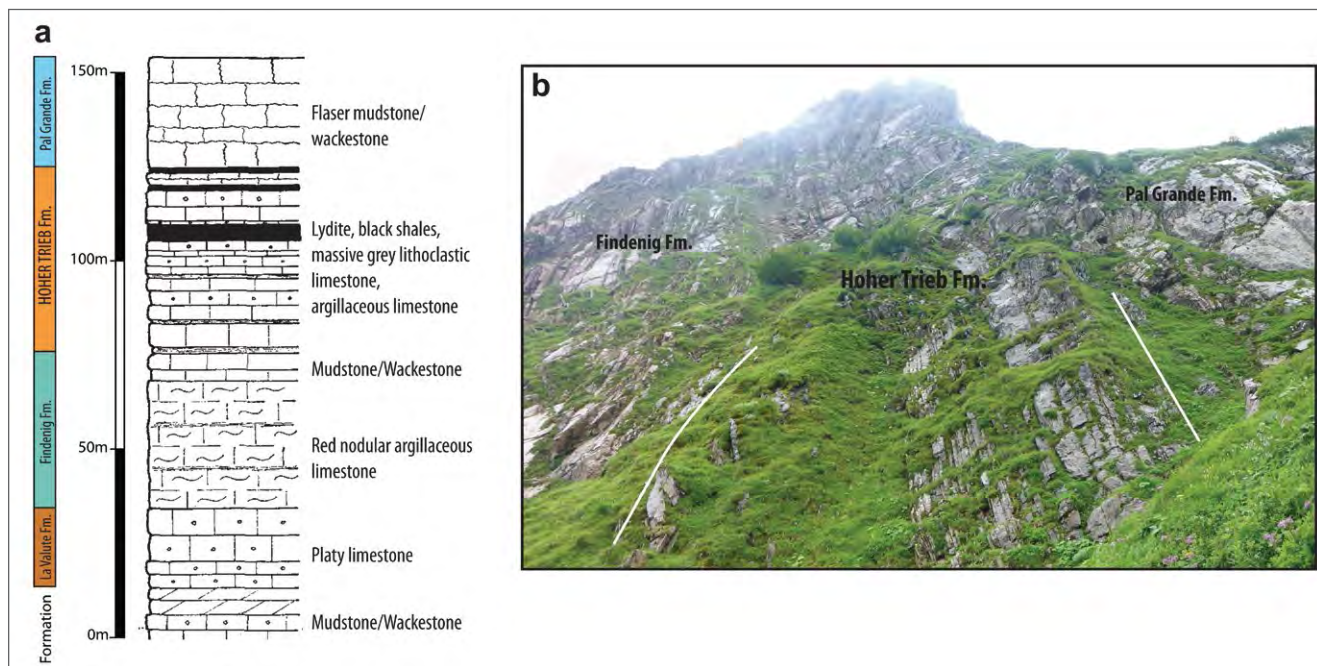
Facies C: medium dark gray thin to medium-bedded wackestone;

Facies D: black thin to medium-bedded laminated cherts; cherts are also locally present in nodules mainly within facies C;

Facies E: black very thin to thin-bedded laminated shales.



Areas of outcrop of the Hoher Trieb Formation with indication of the stratotype (asterisk) and reference sections (squares). A: Oberbuchach Section; B: Forca di Lanza Section; C: Zuc di Malaseit Bassa Section.



The Hoher Trieb Section. a) log of the Hoher Trieb Formation (SCHÖNLAUB, 1969); b) view of the section taken from the East (photo M. PONDRELLI).

## Fossil content

Cephalopods, conodonts, rugose and tabulate corals, foraminifers, radiolarians, stromatoporoids, tentaculites and trilobites have been documented (ALBERTI, 1985; SCHÖNLAUB, 1985a; KREUTZER, 1992b; KIDO et al., 2011b, c).

## Depositional environment

The Hoher Trieb Formation was formed at the toe-of-slope of a carbonate apron (PONDRELLI et al., 2015). Deposits of hyperconcentrated and concentrated density flows (Facies A) and turbidity flows (Facies B) are embedded within a record of pelagic (Facies C and D) and hemipelagic sediments (Facies E). The platform-derived carbonates are supplied from a reef environment. Black shales suggest formation under temporary dysoxic and anoxic conditions.

## Stratotype

Hoher Trieb Section, located west of Mt. Hoher Trieb/Cuestalta (SCHÖNLAUB, 1969), between coordinates N 46°35'53.9", E 13°03'20.0" (base of the section) and N 46°35'52.5", E 13°03'18.8" (top of the section).

## Reference sections

Zuc di Malaseit Bassa section (KIDO et al., 2011a, b, c), located west of Zuc di Malaseit along path 441 at coordinates N 46°33'19.6", E 13°11'10.6", where the interval with black shales and cherts across the Eifelian-Givetian boundary is well exposed.

Oberbuchach section (SCHÖNLAUB, 1980, 1985a) at coordinates N 46°37'33.9", E 13°06'18.3", where the lower part of the unit is better exposed.

Forca di Lanza section (PONDRELLI et al., 2015), between coordinates N 46°33'19.5", E 13°09'55.7" (base of the section) and N 46°33'18.5", E 13°09'58.8" (top of the section), where the transition with the Pal Grande Formation is well exposed.

## Type area

Carnic Alps.

## Main outcrop areas

The Hoher Trieb Formation crops out in the areas between the Hinterjoch and Nölbling Höhe, between Mt. Hoher Trieb/Cuestalta and Forca di Lanza, and between Mt. Schönwipfel and Mt. Poludnig.

## Thickness

About 25 m to about 50 m.



## Boundaries

*Underlying units* – Findenig Formation (conformable interfingering).

*Overlying units* – Pal Grande Formation (conformable sharp).

*Lateral units* – Vinz Formation, Cellon Formation, Freikofel Formation (proximal part); Findenig Formation, Valentin Formation (distal part).

## Derivation of name

After Mount Hoher Trieb.

## Synonymy

Facies corallina [partim]: TARAMELLI (1895).

Formazione di Monte Lodin [partim]: SELLI (1963a).

Formazione di Monte Lodin [partim]: SELLI (1963b).

“20m-Bank” [partim]: PÖLSLER (1969).

Gebankte Kalke mit Lydit [partim]: PÖLSLER (1969).

Blockhorizont [partim]: PÖLSLER (1969).

Massiger Kalk mit verkieselten Korallen [partim]: PÖLSLER (1969).

Dunkler Plattenkalk: SCHÖNLAUB (1969).

Hoher Trieb Kalk: SCHÖNLAUB (1981).

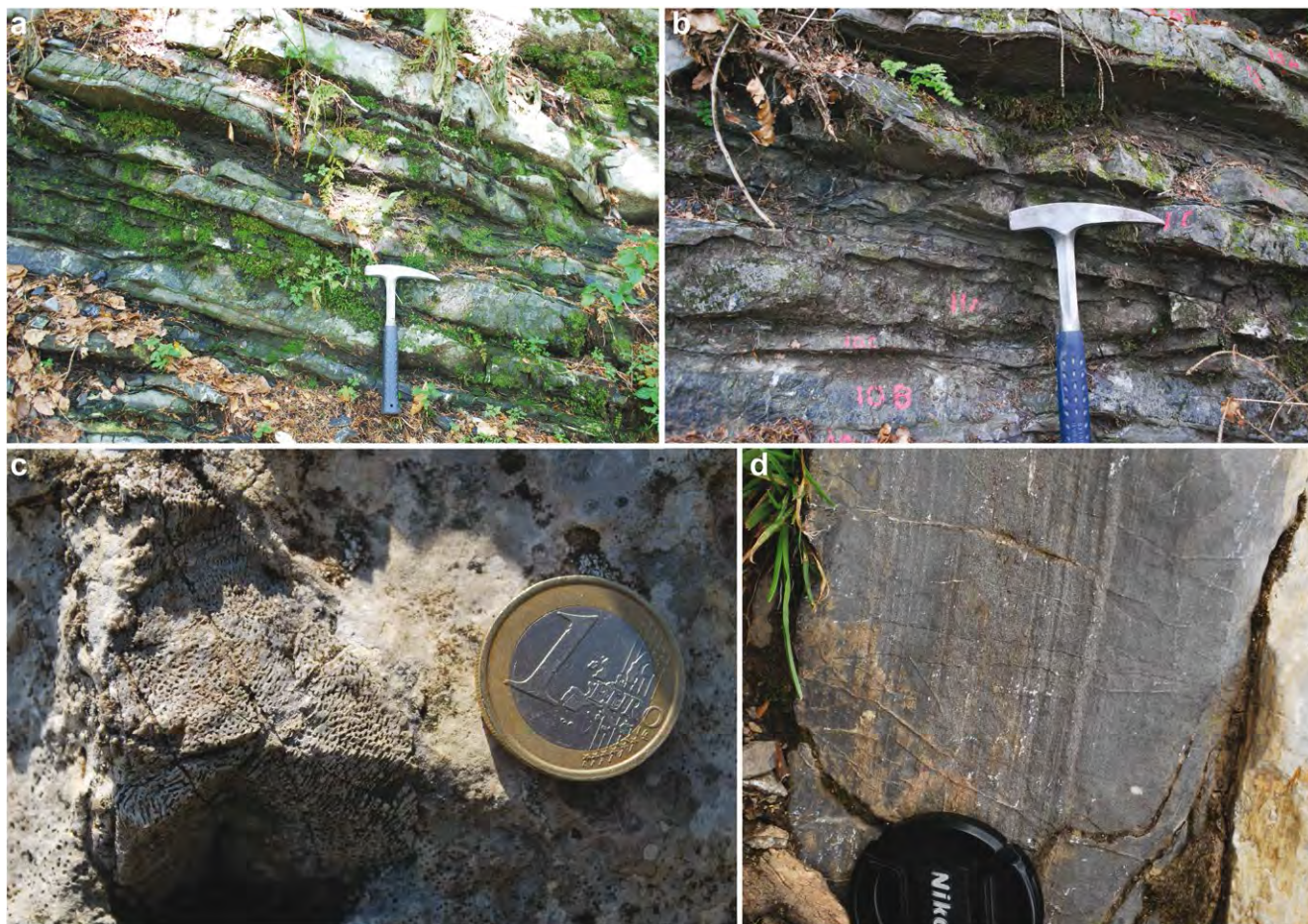
Tentaculite pelagic limestone [partim]: SPALLETTA & VENTURINI (1989).

Hoher Trieb Formation: KREUTZER (1992a).

Cuestalta Limestone [partim]: BRIME et al. (2008).

## Chronostratigraphic age

Devonian: Emsian to Frasnian (SCHÖNLAUB, 1980, 1985a; PERRI & SPALLETTA, 1998; KIDO et al., 2011a, b, c; PONDRELLI et al., 2015).



Views of the Hoher Trieb Formation in the field (photos M. PONDRELLI). a) interbedded Facies C, D, E: Zuc di Malaseit Bassa Section; b) interbedded Facies C, D, E: Zuc di Malaseit Bassa Section; c) silicified coral in Facies A: Forca di Lanza; d) laminated grainstone passing to packstone (Facies B): Zuc di Malaseit Bassa Section.

## Biostratigraphy

*Conodonts*. – The base of this formation is diachronous: conodont data from the Mt. Culet area (PERRI & SPALLETTA, 1998) provide a *serotinus* Zone for the basal part of the Hoher Trieb Formation while in the Mt. Pizzul area the base of the unit appears to belong at least to the *costatus* Zone (PONDRELLI et al., 2015).

The top of the formation reaches the MN3 Zone at the Forca di Lanza area (PONDRELLI et al., 2015).

## Complementary references -

## Remarks -

## References

- ALBERTI, G.K.B. (1985): Zur Tentaculitenführung im Unter- und Mittel-Devon der zentralen Karnischen Alpen (Österreich). – Courier Forschungsinstitut Senckenberg, **75**, 375–387, Frankfurt am Main.
- 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.
- HUBMANN, B., POHLER, S., SCHÖNLAUB, H.P. & MESSNER, F. (2003): Paleozoic Coral-Sponge Bearing Successions in Austria. – Berichte der Geologischen Bundesanstalt, **61**, 1–91, Wien.
- KIDO, E., SUTTNER, T.J., KOPTIKOVÁ, L., PONDRELLI, M., CORRADINI, C., CORRIGA, M.G., SIMONETTO, L., BERKYOVÁ, S. & VODRÁŽKA R. (2011a): Magnetic susceptibility as tool for high-resolution correlation of pelagic and distal slope facies of the Middle Devonian in the Carnic Alps: preliminary results. – In: KOPTIKOVÁ, L., HLADIL, J., & ADAMOVIĆ, J. (eds.): Miroslav Krs Conference: Time, Magnetism, Records, Systems and Solutions. The 2011 Annual IGCP 580 Meeting, Institute of Geology ASCR, v.v.i., 31–32, Prague.
- KIDO, E., SUTTNER, T.J., PONDRELLI, M., CORRADINI, C., CORRIGA, M.G., SIMONETTO, L. & BERKYOVÁ, S. (2011b): Correlation of Mid-Devonian coral deposits of the Carnic Alps across the Austro-Italian border. – In: ARETZ, M., DELCULÉE, S., DENAYER, J. & POTY, E. (eds.): 11th Symposium on Fossil Cnidaria and Sponges. – Kölner Forum für Geologie und Paläontologie, **19**, 73–76, Liège.
- KIDO, E., SUTTNER, T.J., PONDRELLI, M., CORRADINI, C., CORRIGA, M.G., SIMONETTO, L. & BERKYOVÁ, S. (2011c): Middle Devonian rugose corals of the Carnic Alps and their relation to the Late Eifelian Kačák Event. – In: SUTTNER, T.J., KIDO, E., PILLER, W.E. & KÖNIGSHOF, P. (eds.): IGCP 596 - Opening Meeting, Graz. – Berichte des Institutes für Erdwissenschaften der Karl-Franzens-Universität Graz, **16**, 54–56, Graz.
- KREUTZER, L.H. (1992a): Palinspastische Entzerrung und Neugliederung des Devons in den Zentralkarnischen Alpen aufgrund von neuen Untersuchungen. – Jahrbuch der Geologischen Bundesanstalt, **135/1**, 261–272, Wien.
- KREUTZER, L.H. (1992b): Photoatlas zu den variszischen Karbonat-Gesteinen der Karnischen Alpen (Österreich/Italien). – Abhandlungen der Geologischen Bundesanstalt, **47**, 1–129, Wien.
- PERRI, M. & SPALLETTA, C. (1998): Updating of the conodont biostratigraphy in the Carnic Alps (Italy). – In: PERRI, M.C. & SPALLETTA, C. (eds.): Southern Alps Field Trip Guidebook, Seventh International Conodont Symposium held in Europe. – Giornale di Geologia, Special Issue, **60**, 116–119, Bologna.
- PÖLSLER, P. (1969): Stratigraphie und Tektonik im Nordabfall des Findenigkofels (Silur bis Karbon; Karnische Alpen, Österreich). – Jahrbuch der Geologischen Bundesanstalt, **112**, 355–398, Wien.
- PONDRELLI, M., CORRADINI, C., CORRIGA, M.G., KIDO, E., MOSSONI, A., SIMONETTO, L., SPALLETTA, C., SUTTNER, T.J. & CARTA, N. (2015): Depositional and deformational evolution of a Lower Paleozoic portion of the Southalpine domain: the Mt. Pizzul area (Carnic Alps, Italy). – International Journal of Earth Sciences, **104**: 147–178, Berlin-Heidelberg.
- SCHÖNLAUB, H.P. (1969): Das Paläozoikum zwischen Bischofalm und Hohem Trieb (Zentrale Karnische Alpen). – Jahrbuch der Geologischen Bundesanstalt, **112/2**, 265–320, Wien.
- SCHÖNLAUB, H.P. (1980): Carnic Alps. Field Trip A. with contributions from JAEGER, H., HOUSE, M.R., PRICE, J.D., GÖDDERTZ, B., PRIEWALDER, H., WALLISER, O.H., KRÍŽ, J., HAAS, W. & VAI, G.B. – In: SCHÖNLAUB, H.P. (ed.): Second European Conodont Symposium, ECOS II, Guidebook, Abstracts. – Abhandlungen der Geologischen Bundesanstalt, **35**, 5–57, Wien.
- SCHÖNLAUB, H.P. (1981): Geologische Detailkarte des Gebietes um den Zollner See. – In: SCHÖNLAUB, H.P. (ed.): Vom Urknall zum Gailtal – 500 Millionen Jahre Erdgeschichte in der Karnischen Region. – Verlag der Geologischen Bundesanstalt, 3. Auflage, 169 p., Hermagor.
- SCHÖNLAUB, H.P. (1985a): Devonian conodonts from section Oberbuchach II in the Carnic Alps (Austria). – Courier Forschungsinstitut Senckenberg, **75**, 353–374, Frankfurt am Main.
- SCHÖNLAUB, H.P. (1985b): Das Paläozoikum der Karnischen Alpen. – In: SCHÖNLAUB, H.P. (ed.): Arbeitstagung der Geologischen Bundesanstalt 1985 Kötschach-Mauthen, Gailtal – Geologische Bundesanstalt, 34–52, Wien.
- SELLI, R. (1963a): Schema geologico delle Alpi Carniche e Giulie occidentali. Scala 1:100.000. – Giornale di Geologia, **30**, 1–136, Bologna.
- SELLI, R. (1963b): Carta geologica del Permo-Carbonifero pontebano, scala 1:20.000. – L.A.C., Firenze.
- SPALLETTA, C. & PONDRELLI, M. (2009): Calcari di Cuestalta. – In: VENTURINI, C. (ed.): Note Illustrative del Foglio 031 Ampezzo. – Carta Geologica d'Italia alla scala 1:50000, Istituto Superiore per la Protezione e la Ricerca Ambientale (ex-Agenzia per la Protezione dell'Ambiente e per i Servizi Tecnici, Servizio Geologico d'Italia), 41–42, Stampa A.T.I. – S.EL.CA. srl. – L.A.C. srl. – System Cart srl., Firenze.
- 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.
- TARAMELLI, T. (1895): Osservazioni stratigrafiche sui terreni paleozoici nel versante italiano delle Alpi Carniche. – Rendiconti della Reale Accademia dei Lincei, s. **5**, 4, 185–193, Roma.

# ZOBODAT - [www.zobodat.at](http://www.zobodat.at)

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Abhandlungen der Geologischen Bundesanstalt in Wien](#)

Jahr/Year: 2015

Band/Volume: [69](#)

Autor(en)/Author(s): Pondrelli Monica, Schönlaub Hans-Peter, Corradini Carlo, Spalletta Claudia, Suttner Thomas, Kido Erika, Perri Maria Cristina, Simonetto Luca, Corrigan Maria G., Mossoni Angelo, Pohler Susanne M.L., Hüneke Heiko

Artikel/Article: [Hoher Trieb Formation 125-128](#)