

## Lower and Middle Devonian conodonts (upper Emsian-Eifelian) from the Prastav Quarry, Praha-Holyně

Stanislava Vodrážková<sup>1</sup>

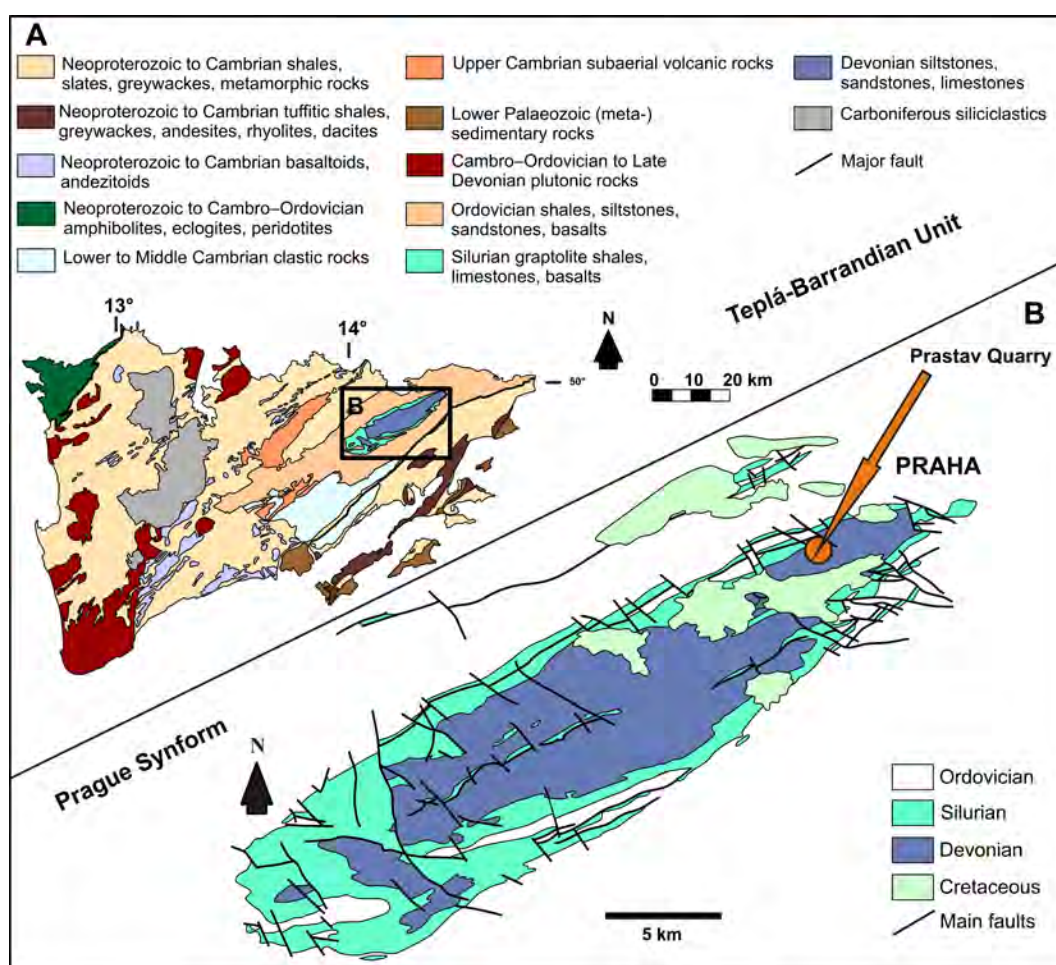
<sup>1</sup>Czech Geological Survey, Geologická 6, 152 00, Praha 5, Czech Republic. stana.vodrazkova@seznam.cz

**Locality** - abandoned quarry situated 300 m N of Praha-Holyně, N 50°02'01", E 14°21'15" (Fig. 1).

**Lithostratigraphic units** - Třebotov Limestone (Daleje-Třebotov FM.) and Choteč Limestone (Choteč FM.)

**Age** - Lower and Middle Devonian, upper Emsian-lower Eifelian, interval *serotinus* – *costatus* Zones.

**What to see** - regional reference section for Lower-Middle Devonian boundary (base of *partitus* Zone), lithological manifestation of the Basal Choteč Event at the Třebotov/Choteč Limestone boundary (base of *costatus* Zone).



**Figure 1.** A location of the Prastav Quarry in the Prague Synform (i.e a part of the Teplá-Barrandian Unit).

### How to get there

The quarry (Fig. 2) is situated in the southwest part of Prague, north from Holyně borough. It is well accessible from Za Knotkem street.

### Historical outline

Conodonts related papers: Klapper (1977), Klapper, Ziegler & Mashkova (1978), Berkýová (2009), Klapper & Vodrážková (2013).

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Paleoenvironment related papers: e.g., Chlupáč (1959), Chlupáč et al. (1979), Koptíková (2011), Vodrážková et al. (2013).



**Figure 2.** Prastav Quarry with Třebotov Lm. and Choteč Lm. boundary marked.

### **Lithology and fossil content**

Třebotov Limestone (*serotinus-partitus* zones) consists of intensively bioturbated, medium bedded, reddish-light grey skeletal wackestones. Choteč Limestone (*costatus* Zone) consists of alternation of medium-thin bedded dark lime-mudstones and skeletal wackestones with dark, graded crinoidal grainstones (calciturbidites).

### **Palaeoenvironment**

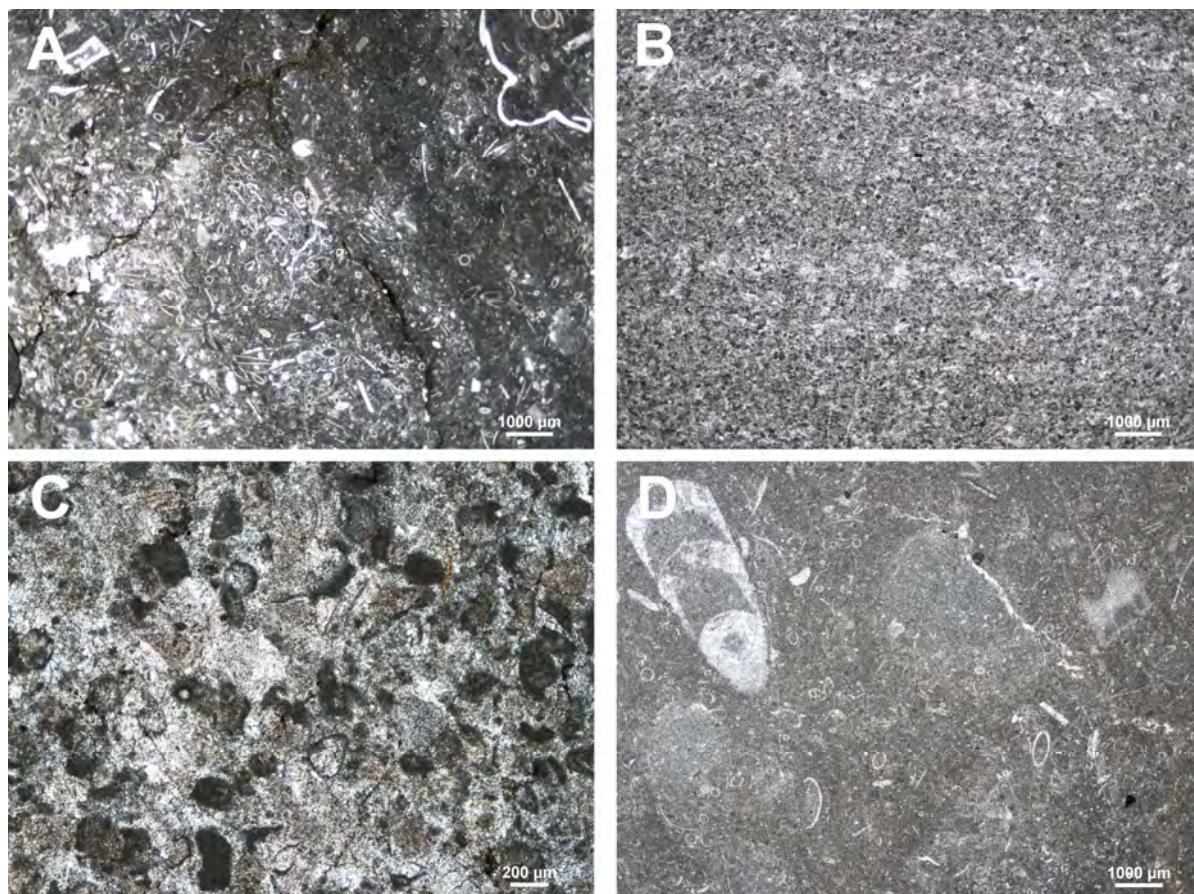
#### ***Třebotov Limestone***

The presence of micritic matrix, higher amount of planktonic (dacryoconarid tentaculites) and nektonic (nautiloids and goniatites) organisms, a benthic fauna typical of muddy bottom environments, and absence of sedimentological features indicative of current activity suggest calm, low-energy, relatively deep settings rich in dissolved oxygen (inferred from intense bioturbation and the presence of abundant benthic faunas, see Fig. 3). The sedimentary environment corresponds to proximal offshore, below storm wave-base.

#### ***Choteč Limestone***

This facies reflects the effect of the Basal Choteč Event (*costatus* Zone). Gravity flow deposits (calciturbidites) deposited in the outer ramp settings, with basal parts of the succession representing more distal sediments associated with sea-level rise. The background sediments, represented by

dark-gray to light-gray lime-mudstones (laminated at some levels) and wackestones (Fig. 3), show certain similarities to Třebotov Limestone, but the oxygen deficiency of the former is obvious (darker color, impoverished benthic fauna, presence of prasinophytes).



**Figure 3.** Thin sections from the Prastav Quarry: **A.** bioturbated skeletal wackestone, Třebotov Limestone, *serotinus* Zone. **B.** **C.** crinoidal grainstone with peloids at the base of the Choteč Limestone, *partitus* Zone. **D.** skeletal wackestone of the Choteč Limestone (background sedimentation), *partitus* Zone.

The onset of environmental changes was recorded already in the *partitus* Zone: changes in trilobite assemblages, increased number of prasinophytes and calcispheres, small negative carbon isotopic excursion (Vodrážková et al., 2013 and references therein).

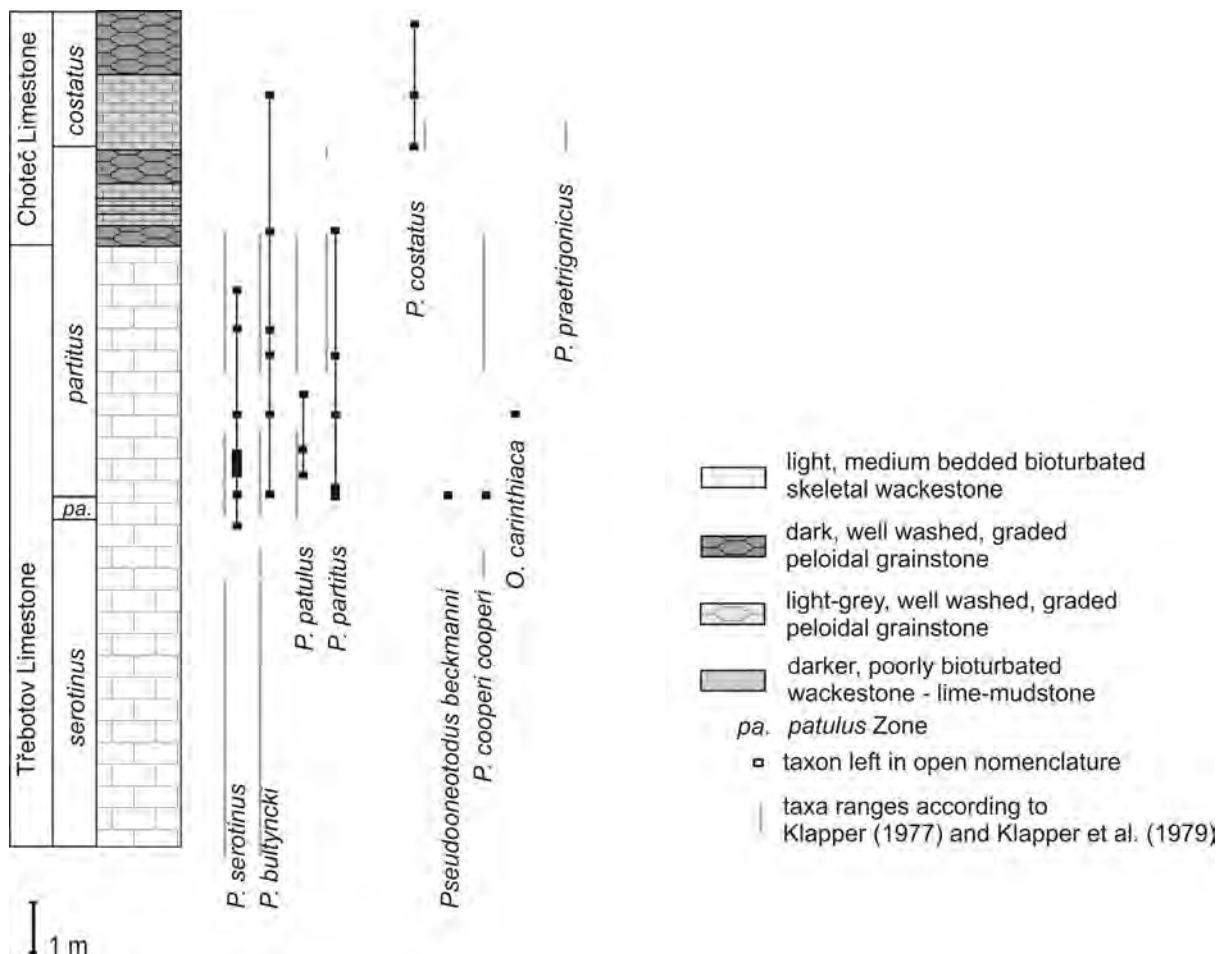
### Conodonts

The following conodont taxa were recorded at Prastav Quarry (Klapper, 1977; Klapper et al., 1978; Berkyová, 2009): *Polygnathus serotinus* Telford, *P. bultyncki* Weddige, *P. cooperi cooperi* Klapper, *P. patulus* Klapper, *P. partitus* Klapper, Ziegler & Mashkova, *P. costatus* Klapper, *P. praetrigonicus* Bardashev, *Ozarkodina carinthiaca* (Schulze), *Pseudooneotodus beckmanni* (Bischoff & Sannemann). Except for *Polygnathus serotinus*, which represents the most common taxon of the *serotinus-partitus* zones, conodonts are of low abundance and diversity and juvenile forms prevail.

Thanks to high abundances of *P. serotinus*, an important intraspecific and ontogenetic variability has been described by Klapper & Vodrážková (2013). In previous studies, nine different names have been applied to this taxon, which were all synonymized by the above mentioned authors. Interestingly, *P. serotinus* has not been recorded in the Choteč Limestone. The disappearance of the taxon from the Prague Synform could be a consequence of environmental changes related to the Basal Choteč event.

### Biostratigraphy

The following zones were recorded at the Prastav Quarry (Klapper, 1977; Klapper et al., 1978, Berkyová, 2009): *serotinus*, *patulus*, *partitus* and *costatus* zones (Fig. 4). Unfortunately, zonally important taxa, i.e., *P. patulus*, *P. partitus* and *P. costatus* are rather rare (selected specimens are figured on Fig. 5), which hampers regional correlations. *Polygnathus praetrigonicus* (= *P. aff. trigonicus sensu* Klapper, 1971) represents rather important taxon as it occurs only at the base of the *costatus* Zone not only in the Prague Synform, but also elsewhere (e.g., Klapper, 1971; Berkyová, 2009). The Lower-Middle Devonian boundary, based on the first appearance of *Polygnathus partitus*, correspond to upper part of the Třebotov Limestone, 5 m below top of the unit.



**Figure 4.** Schematic log with conodont taxa ranges of the Prastav Quarry, modified after Berkyová (2009).

### Additional remarks

In general, the Lower-Middle Devonian conodont zonal concept does not mirror the total ranges of zonally defining taxa. The persistence of a stratigraphically older taxon into a younger zone or zones is common. In addition, zonal scheme is based on taxa with close phylogenetic affinity (*costatus* group). For reasonable stratigraphy it is therefore advisable to include other fossil groups (e.g., dacryconarid tentaculites) and employ other stratigraphical methods (e.g., chemostratigraphy, magnetostratigraphy).



**Figure 5.** Selected conodont taxa from the Prastav Quarry, scale bar is 100  $\mu\text{m}$ .

1. *Polygnathus bultyncki*, juvenile form, Třebotov Limestone, *partitus* Zone. 2-3. *Polygnathus serotinus*, juvenile forms, Třebotov Limestone, *partitus* Zone. 4. *Polygnathus costatus*, Choteč Limestone, *costatus* Zone. 5. *Polygnathus partitus*, Choteč Limestone, *partitus* Zone.

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