Pokroky v paleontologickém a stratigrafickém výzkumu staršího paleozoika Českého krasu za posledních padesát let

Petr Budil, Česká geologická služba

Prof. RNDr. Ivo Chlupáč, DrSc.

6. 12. 1931 – 7. 11. 2002

„Dospěl-li jsem tak daleko, tedy jen dík tomu, že jsem stál na ramennou obrů.“ — Isaac Newton

Radvan Horný

Jiří Kříž

Ivo Chlupáč

Rudolf Prokop

Vladimír Havlíček

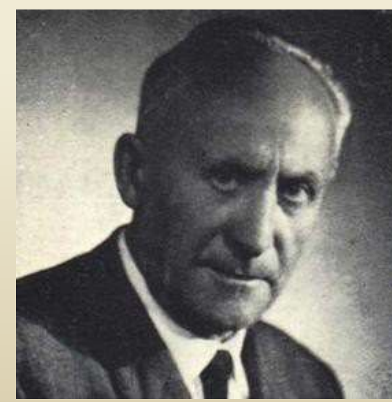
Josef Svoboda

Ferdinand Prantl

Jaroslav Kraft

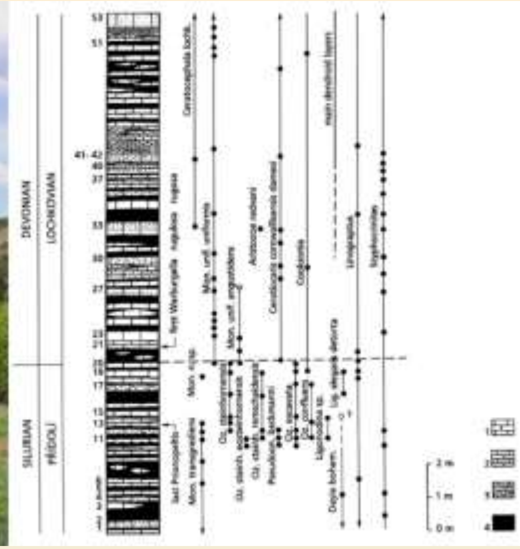
Alois Přibyl

Milan Šnajdr



Bedřich Bouček

Tři mezinárodní stratotypy, dva parastratotypy



silur/devon: Klonk u Suchomast (1972)

přídolí: Požáry u Řeporyj (1982)

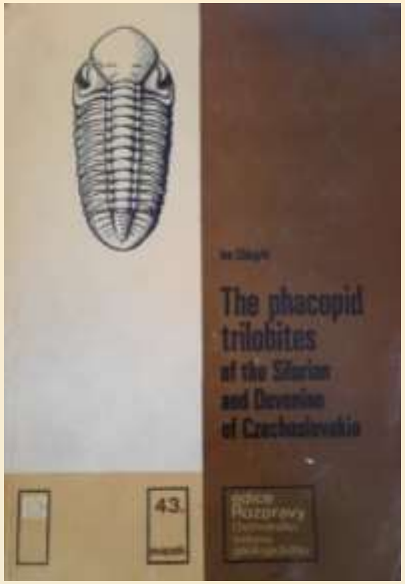
silur/devon: Budňanská skála u Karlštejna (1972)

lochkov/prag: Homolka ve Velké Chuchli (1989)

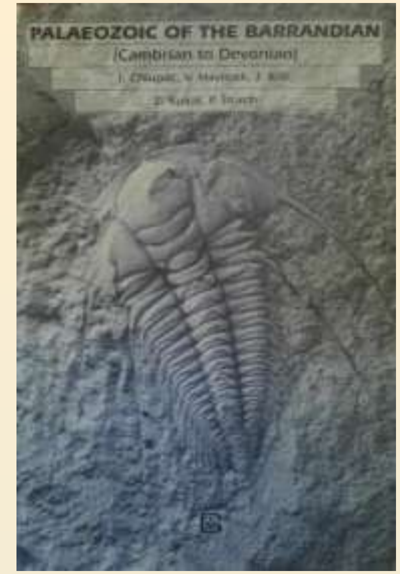
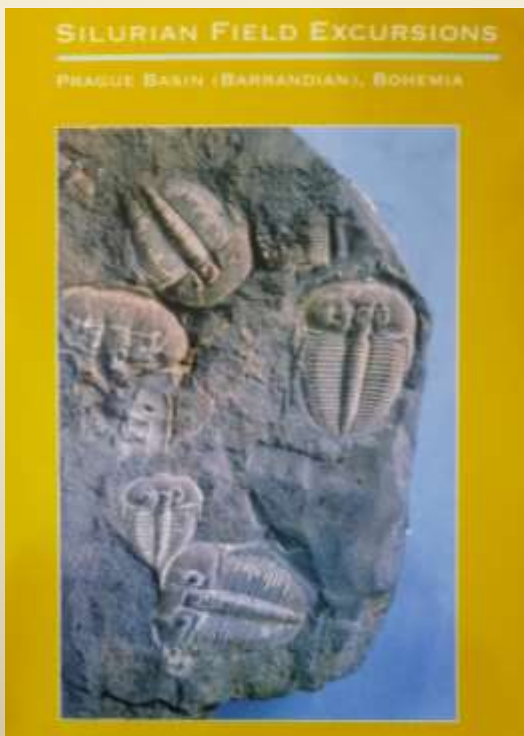
spodní/střední devon Lom Prastav u Holyně (1999)

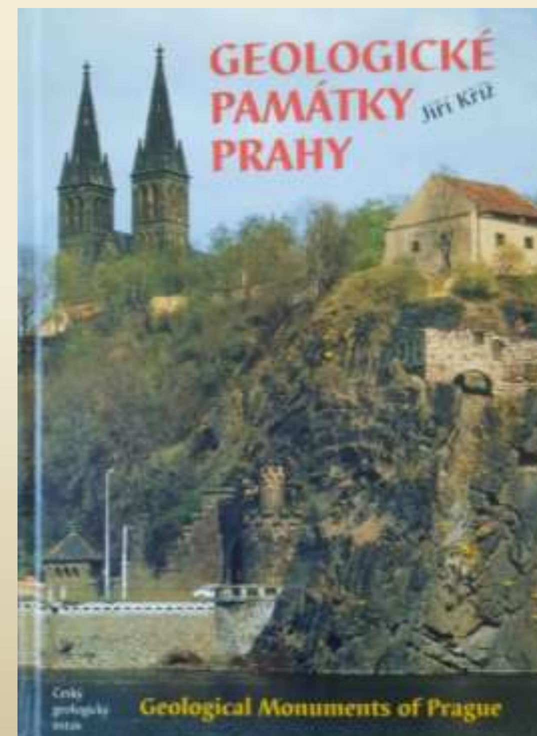
Generace našich předchůdců odvedla fantastickou práci

- Stovky článků, desítky monografií, **které stále mají co říci** a koncepty z nich často stále platí
- Moderní revize většiny skupin a jejich srovnání se zahraničními zástupci (navzdory „železné oponě“)
- **Velmi jemné stratigrafické členění zejména siluru, ale i devonu a dalších útvarů pražské pánve**
- Modely struktury pánví, dosud ne zcela překonané (zastarávající)


The phacopid trilobites of the Silurian and Devonian of Czechoslovakia
43.
edice Rozpravy

Devonian goniatites from the Barrandian area, Czechoslovakia
46.
edice Rozpravy

Silurian brachiopods and benthic communities in the Prague Basin (Czechoslovakia)
48.
edice Rozpravy

PALAEOZOIC OF THE BARRANDIAN
(Cambrian to Devonian)

SILURIAN FIELD EXCURSIONS
PRAGUE BASIN (BARRANDIAN), BOHEMIA

Geologické zajímavosti pražského okolí
IVO CHLUPÁČ
ACADEMIA / PRAHA

GEOLOGICKÉ PAMÁTKY PRAHY
Jiří Kříž
Geological Monuments of Prague

Ivo Chlupáč – štola Na Rešnách (1977)

Odchod ředitele ÚÚG Dr. J. Svobody z funkce (1970)

Nesporně vynikající odborné kvality badatelů „zlatých let“

Relativně dobré existenční, **vynikající organizační podmínky**, **nic nerozptylovalo** (<u>nebyly mobily ani PC</u>),

Navzdory nedobrým politickým podmínkám **byl relativní dostatek peněz, prostředků a lidí***

*Tedy pokud nebyli z místa „odejiti“ – potkalo to nakrátko i Prof. I. Chlupáče

Moderní doba

Realita: ideální podmínky skončily

Nedostávají se peníze

řádově nižší podpora ze strany společnosti (úspory)

Grantový systém – byrokracie, honba za body → → →
publikace množství drobniček (v prestižních časopisech)

Chybí podmínky pro časově náročné studie

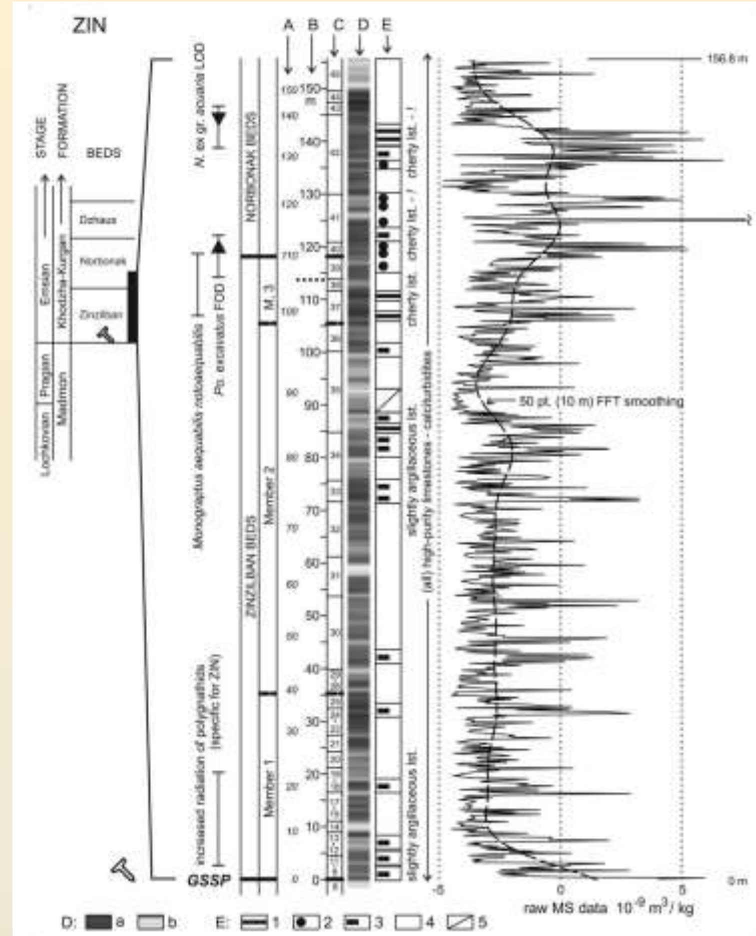
Nechybí entusiasmus, ale ubývá sil

Děláme, co můžeme (???)

Budil (2012)

Jakékoli hodnocení současného stavu nemůže být věcně správné, schází odstup

Vždy je tu nebezpečí, že práce některého z kolegů nedoceníte, či jednoduše opomenete…



Přesto se o **shrnutí** pokusím

Bude nutně
zkreslené, neúplné a subjektivní

Pokroky ve výzkumu jednotlivých skupin (taxonomie, paleoekologie, tafonomie): specialisté (= za kým dnes jít pro určení zkameněliny)

- trilobiti a další členovci – M. Šnajdr, J. Vaněk, P. Budil, M. Mergl, J. Bruthansová, V. Vokáč, F. Hartl, F. Hörbinger, M. Šilinger, + J. Collette, E. Tetlie
- skolekodonti – P. Tonarová + O. Hints, M.R. Eriksson, T. Suttner
- mlži – J. Kříž, M. Polechová
- plži – R. Horný, J. Frýda + R.B. Blodget, P.R. Racheboeuf
- hlavonožci – V. Turek a Š. Manda
- brachiopodi – V. Havlíček, M. Mergl
- Mechovky – J. Kříž + A.L. Ferretti, K. Zágoršek
- Graptoliti; dendroidi – B. Bouček, A. Přibyl, P. Štorch + M. J. Melchin; J. Kraft
- dacryoconaridní tentakuliti – P. Lukeš, L. Ferrová, S. Vodrážková
- konodonti – L. Slavík, S. Vodrážková + O. Lehnert
- ostnokožci – R.J. Prokop, V. Petr, M. Nohejlová
- korálnatci a stromatoporoidi – A. Galle, J. Hladil
- konulárie – J. Bruthansová (M. Mergl)
- hyoliti – L. Marek, M. Valent
- Chitinozoa, Acritarcha, Prasinophyta, Foraminifera, Radiolaria – O. Fatka, R. Morávek, P. Dufka, J. Vodička, J. Bek, S. Vodrážková, K. Holcová, P. Čejchan + F. Paris, R. Brocke
- obratlovci – V. Vaškaninová + P. Ahlberg
- ichnofosílie – R. Mikuláš
- rostliny – J. Obrhel, M. Libertín, J. Kvaček, P. Kraft

Pracuje se tvrdě, intenzivně až hekticky (vysoké stovky článků). Velké množství velmi zajímavých prací (na hranici sledovatelnosti)

Kombinace klasických přístupů s moderními laboratorními metodami (CT, synchrotron)

Častější užití statistických metod, kombinace paleontologických, sedimentologických, geochemických výzkumů vedoucí k mnohem komplexnějšímu pohledu, nežli dříve

Pracuje se v často rozsáhlých týmech, ve spolupráci se zahraničními kolegy

Návrhy nových stratotypů

- **Aeron (silur)** – tým vedený Dr. Petrem Štorchem (Hlásná Třebaň)

- **Rozdělení oddělení přídolí (silur) na stupně** – tým vedený Dr. Štěpánem Mandou

- **Spodní/svrchní ems (spodní devon) – příprava kandidátského stratotypu** – tým vedený Prof. Jiřím Frýdou (Čeřinka u Bubovic)

- \+ Snaha o redefinici stratotypů stávajících (prag/ems) – tým vedený dr. L. Slavíkem
- **Detailní konodontová stratigrafie stupně lochkov (spodní devon)** – tým vedený Dr. L. Slavíkem


LETHAIA

A proposed new global stratotype for Aeronian Stage of the Silurian System: Hlásná Třebaň section, Czech Republic

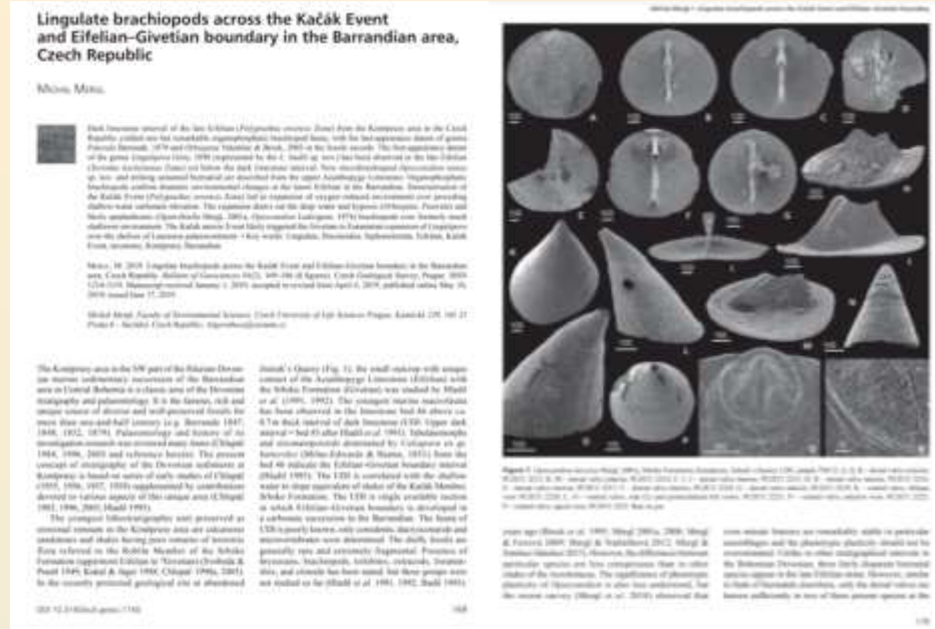

Division of Přídolí Series in Central Bohemia: graptolite and conodont biostratigraphy, faunal changes, and geochemical record

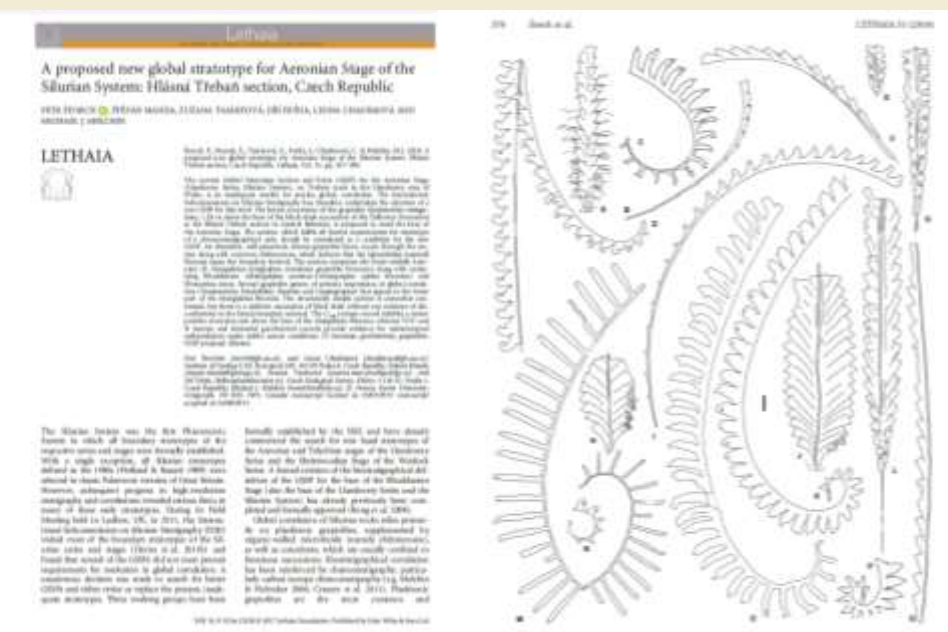

Subdivision of the Lochkovian Stage based on conodont faunas from the stratotype area (Prague Synform, Czech Republic)


High-resolution tentaculite biostratigraphy and facies development across the Early Devonian Daleje Event in the Barrandian (Bohemia): implications for global Emsian stratigraphy

Příklady syntetizujících publikací


Sedimentary Geology


Lingulate brachiopods across the Kačák Event and Eifelian–Givetian boundary in the Barrandian area, Czech Republic


Lethaia

A proposed new global stratotype for Aeronian Stage of the Silurian System: Hlásná Třebaň section, Czech Republic

LETHAIA

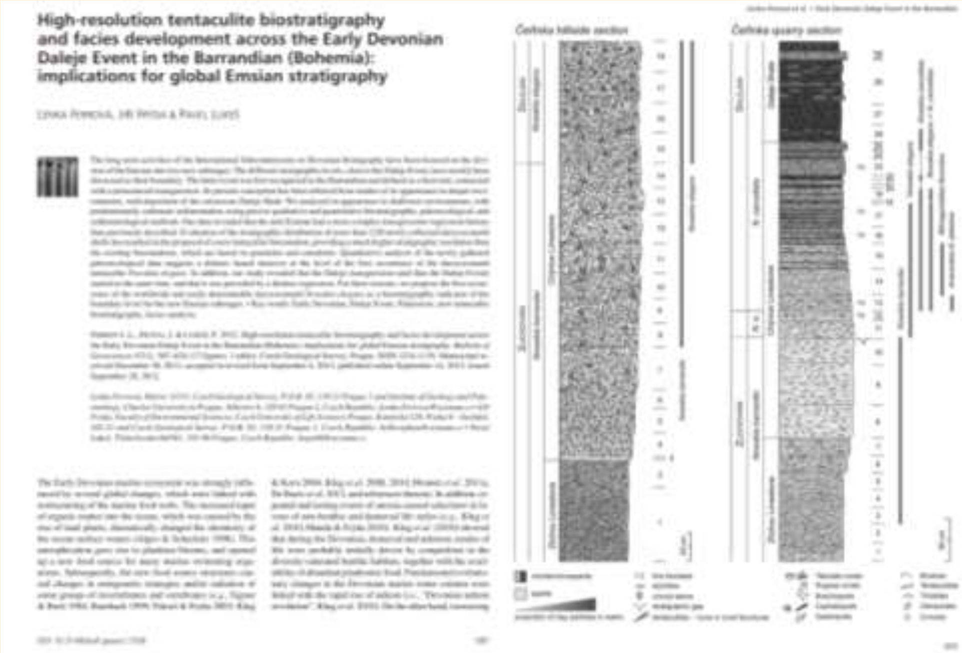

Silurian-Devonian boundary events and their influence on cephalopod evolution: evolutionary significance of cephalopod egg size during mass extinctions

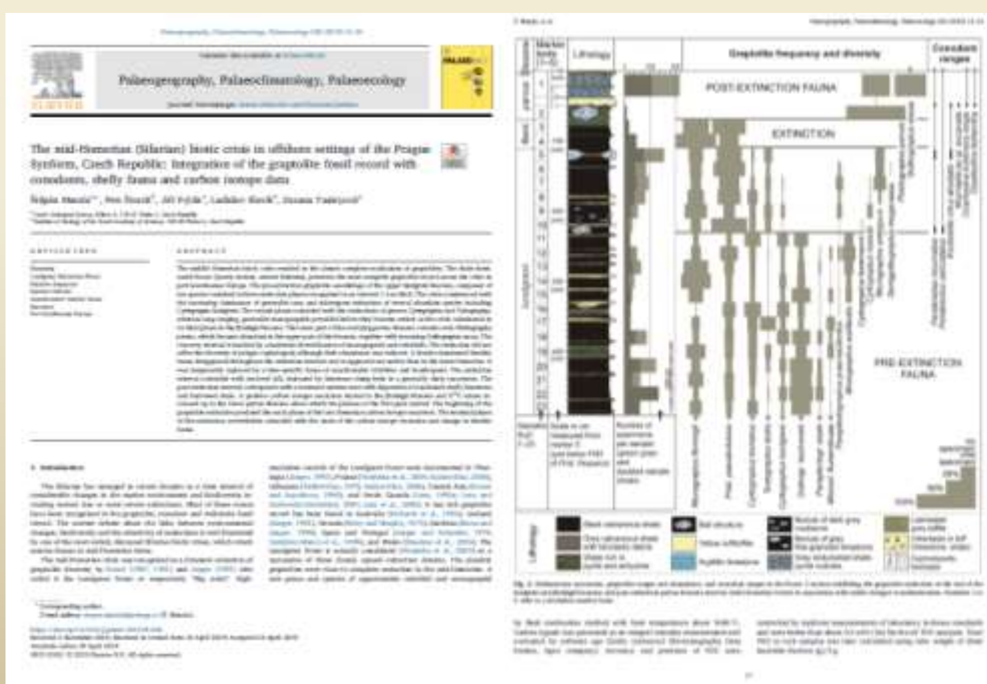
Štěpán Manda & Jiří Frýda

A long-lasting steady period of isotopically heavy carbon in the late Silurian ocean: evolution of the $\delta^{13}C$ record and its significance for an integrated $\delta^{13}C$, graptolite and conodont stratigraphy

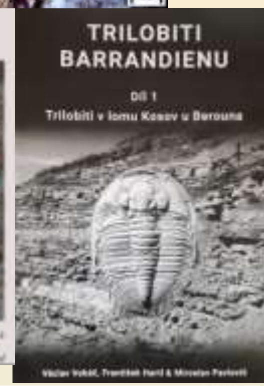
Jiří Frýda & Štěpán Manda

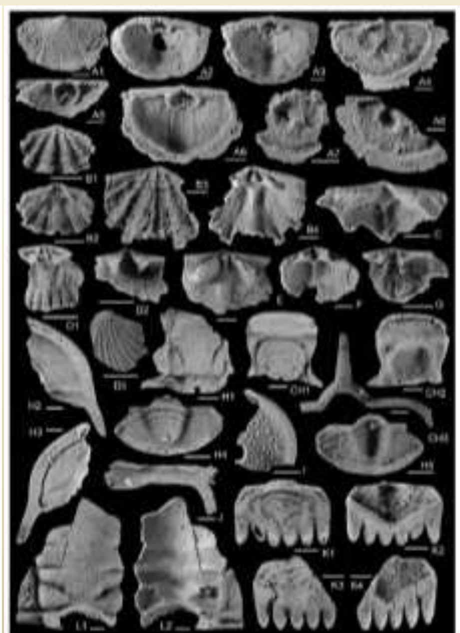
Příklady syntetizujících publikací

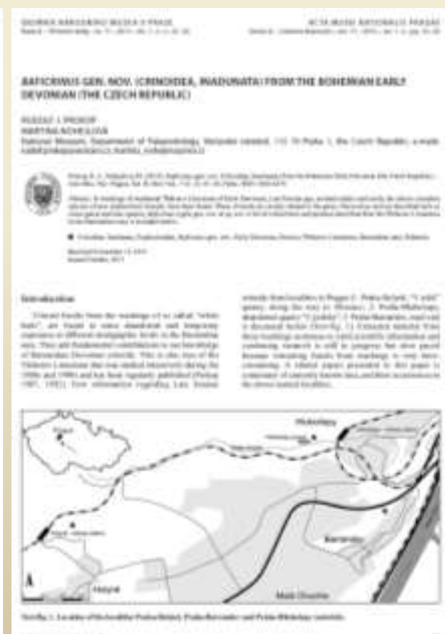


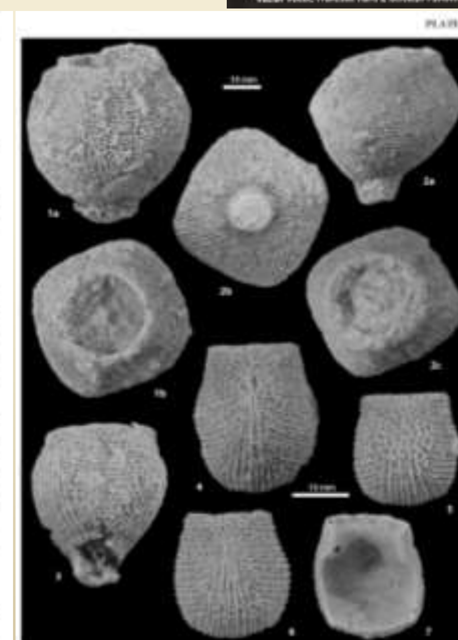


Příklady publikací regionálně významných (s přesahem)









Jiný příklad - výjimečná zachování

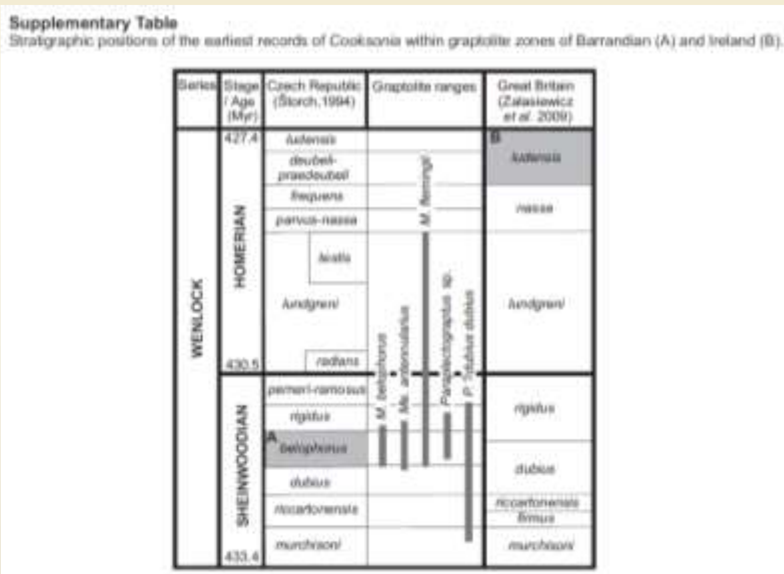

nature plants

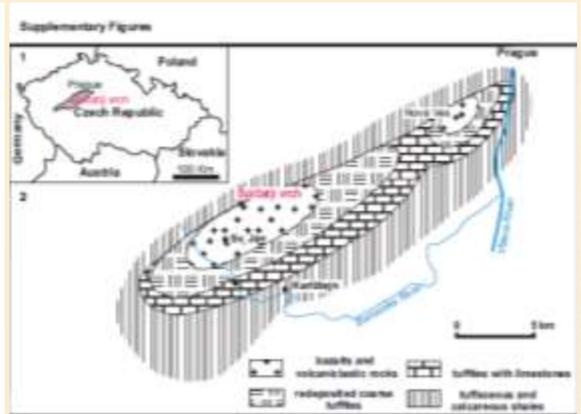
LETTERS

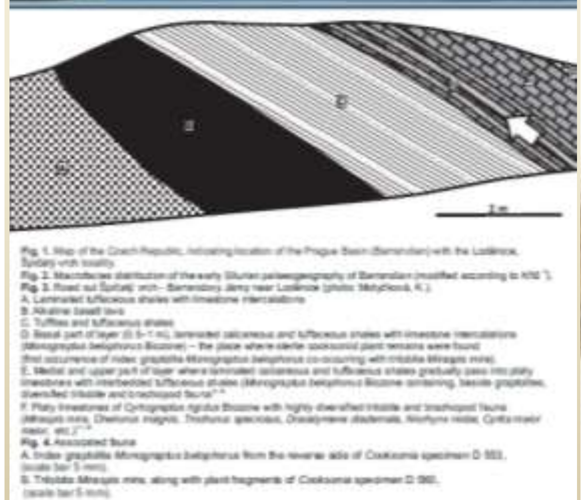
Sporophytes of polysporangiate land plants from the early Silurian period may have been photosynthetically autonomous

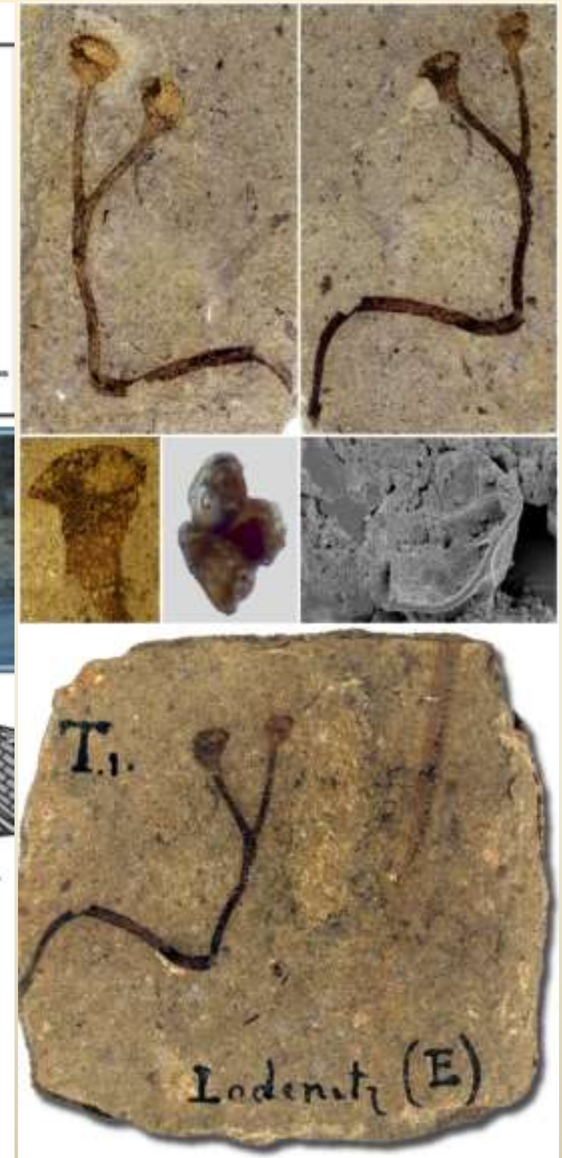
Milan Libertín[1], Jiří Kvaček[1*], Jiří Bek[2], Viktor Žárský[3*] and Petr Štorch[2]

The colonization of land by vascular plants is an extremely important phase in Earth's life history. This key evolutionary process is thought to have begun during the Middle Cambrian period and culminated in the Silurian/Early Devonian period (interval about 509–393 million years ago (Ma)), and is documented primarily by microfossils (that is, by dispersed spores, phytodebris including fragments of algae, tissues, sporangia and cuticles), tubes and rare megafossils. A newly recognized fossil cooksonioid plant with in situ spores from the Barrandian area, Czech Republic, is of the highest importance because it represents extremely ancient megafossil evidence of land plant diploid generation: sporophytes (~432 Ma). The robust size of this plant places it among the largest known early polysporangiate land plants and it is probable that it attained adequate size for both aeration and effective photosynthetic competence. This would mean not only









Libertín et al. (2018)

Early Silurian (mid-Sheinwoodian) palynomorphs from the Loděnice-Špičatý vrch, Prague Basin, Czech Republic

Jiří Bek, Petr Štorch, Petra Tonarová & Milan Libertín

Dispersed spores, cryptospores, scolecodonts, acritarchs, prasinophytes and chitinozoans, dated by graptolites as being middle Sheinwoodian (early Wenlock, *ca* 432 Ma), are described from the Loděnice-Špičatý vrch locality, Prague Basin, Czech Republic. Palynomorphs were macerated from a specimen (stored in the National Museum, Prague), with fragments of *Cooksonia* sp. and the zonal index graptolite *Monograptus belophorus* giving precise stratigraphic position within *Monograptus belophorus* Biozone. Important is the oldest occurrence of monolete spores. The number of spore taxa indicate that minimally six types of early vascular plants and probably two to three types of cryptosporophytes grew on the Svatý Jan Volcanic Island in the Prague Basin. The ecology of the first cryptospore and trilete spore producers within Sheinwoodian–Přídolí interval is discussed with special focus on first two globally important key events (after Homerian glaciation and during Přídolí) for earliest vascular land plants. The combination of palynological and palaeobotanical records confirms important role of volcanic islands of the Prague Basin for the evolution of early land plants. • Key words: palynology, earliest plants, spores and cryptospores, plant events.

Bek, J., Štorch, P., Tonarová, P. & Libertín, M. 2022. Early Silurian (mid-Sheinwoodian) palynomorphs from the Loděnice-Špičatý vrch, Prague Basin, Czech Republic. *Bulletin of Geosciences 97(3)*, 385–396 (6 figures). Czech Geological Survey, Prague. ISSN 1214-1119. Manuscript received March 23, 2021; accepted in revised form August 3, 2022; published online September 3, 2022; issued September 3, 2022.

Jiří Bek & Petr Štorch, Institute of Geology v.v.i., Academy of Sciences of the Czech Republic, Rozvojová 269, 165 00 Prague 8, Czech Republic; mrbean@gli.cas.cz • Petra Tonarová, Czech Geological Survey, Geologická 6, 152 00 Prague 5, Czech Republic • Milan Libertín, National Museum, Střelecká 1740, 193 00 Horní Počernice, Prague, Czech Republic

The origin of land plants is one of the most important events in the Earth's history, having influenced continental and marine ecology as well as the global climate system (Berner *et al.* 2007, Wellman 2010). Many authors have hypothesized that land plants, *i.e.* embryophytes, originated from charophycean green algae and that the earliest land plants were "bryophyte-like" (*e.g.* Steemans *et al.* 2009). Most plants naturally shed their sterile and fertile organs during their lives. Upon death, plants become disarticulated and only rarely it is possible to find large fragments, which provide direct evidence of their existence. Indirect evidence includes phytodebris (or palynodebris or nematoclasts) like tubes, tissues, cuticles and sporangia together with both dispersed or *in situ* spores and/or cryptospores. Spores are much more abundant than plant fossils because they are smaller and consist of resistant material (sporopollenin). It is generally considered that the spore record is several times greater than that of plant macrofossils (Beck & Strother 2001). Another advantage is the often enormous production of spores by their plant producers.

The oldest palynological evidence for the first land plants are cryptospores (
either as monads, obligat
trilete marks. Cryptospor
of spores with cell walls
are distinct from trilete
but resemble land plan
oldest cryptospores are
Cambrian strata (Strother
Middle Devonian rocks
& Steemans 2013, Well
phytes (cryptospore p
sidered to represent the e
1999, Steemans *et al.* 20
considered to represent va
ancestors (Wellman & G
Edwards *et al.* 2014), wi
described from the Ordov

The Ordovician–Silu
sidered to be the crucial
earliest vascular land plar

DOI 10.3140/bull.geosci.1831

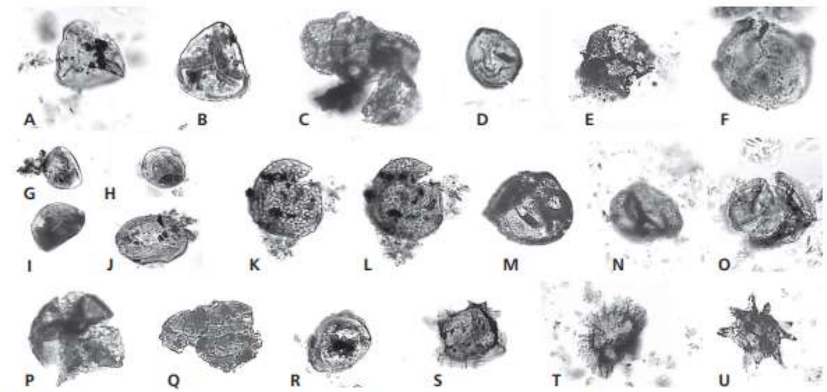


Figure 5. Spores, cryptospores, algae and acritarchs. All ×1500. • A – *Ambitisporites parvus* Burgess & Richardson 1995. • B – *Ambitisporites* spp. • C – tetrad of trilete sculptured spores of the *Aneurospora* type. • D – probably trilete spore of the *Ambitisporites* type. • E – poorly preserved and partly damaged probably trilete spore. • F – circular microspinate to microgranulate palynomorph resembles trilete spore. Note possible trilete mark in the centre. • G – oval laevigate monolete spore. Note monolete laesurae along right margin. • H – probably laevigate monolete spore. Possible monolete laesurae is close to right margin. • I – oval laevigate monolete miospore. Note short monolete laesurae in the centre. • J – oval sculptured palynomorph roughly resembles some monolete spore(?). • K, L – reticulate undetermined algae. • M, N – undetermined algae. • O – tetrad of undetermined algae. • P – tetrad of cryptospores of the *Aconthotetras* type(?). • Q – sculptured tetrad, possibly cryptospores. • R – cryptospores of the *Gneudnaspora* cf. *divellomedia* type. • S – acritarch of the *Cymatiosphaera* type. • T – acritarch of the *Fimbiaglomerella* type. • U – acritarch of the *Cordobesia* type(?).

Some palynomorphs closely resembling trilete spores are poorly preserved and their precise classification is questionable or even not possible (Fig. 5D–F). Sometimes only the rays of the trilete mark, the most important characteristic, are visible with the surface being damaged
g. 5E).
d into trilete and monolete forms.
bitisporites (Fig. 5A, B) and *Am-*
Fig. 5D). Another form is tetrad
spora type (Fig. 5C) which are
g macerated from a sporangium
i from the same stratigraphical
ertín *et al.* 2018a).
evigate monolete (Fig. 5G–I) and
igate (Fig. 5J) monolete spores is

nomorphs. – There are several
heinwoodian microfossils from
uding acritarchs (Dufka 1992),
ns (*e.g.* Dufka 1990, 1992, 1995b;

Morávek 2009; Vodička & Manda 2019), and scolecodonts (Šnajdr 1951). A detailed summary on previous research of organic walled microfossils from the Prague Basin was published by Morávek (2004). The present sampling has revealed that preservation of organic walled microfossils is poor. The original organic matter is corroded, and specimens are flattened and deformed probably due to marine origin of sediments. The state of preservation influenced the determination/classification of chitinozoans and scolecodonts, with the majority being indeterminate. Prasinophytes (Fig. 6U–X) were not studied in detail, though they may be the subject of future research.

The chitinozoan assemblage is not diverse, with two determined taxa and two questionable genera present. Approximately a half of specimens were assigned to *Conochitina* spp. (Fig. 6A–D) and remaining specimens to *Ancyrochyitina* spp. (Fig. 6E–N). Approximately forty specimens were found in sample D 550.

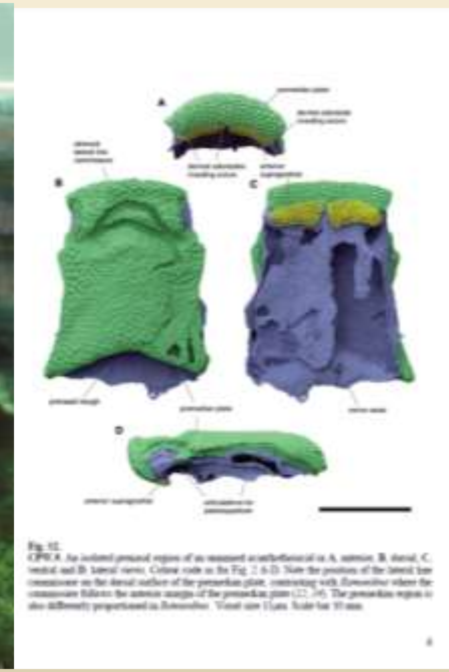
Šnajdr (1951) determined that scolecodonts from the Motol Formation were paulinitids, belonging to the genus *Kettnerites* Žebera, 1935. He studied only poorly preserved

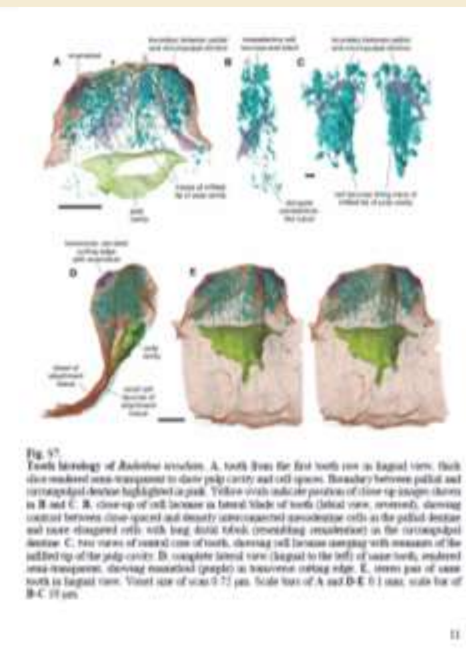
N), scolecodonts (O–T) and prasinophytes (U–X). All scale bars are 100 μm, except for V where it is 200 μm. •
specimen collection number (SCN) PT101.22; B – SCN PT101.26; C – SCN PT101.28; D – SCN PT101.1. • E–N –
PT98.3; F – SCN PT101.4; G – SCN PT101.23; H – SCN PT101.9; I – SCN PT99.6; J – SCN PT101.14; K – SCN
M – SCN PT98.8; N – SCN PT101.16. • O, P – Polychaetaspidae, *Oenonites* sp.; O – first left maxilla, lateral view,

Palaeogeography, Palaeoclimatology, Palaeoecology

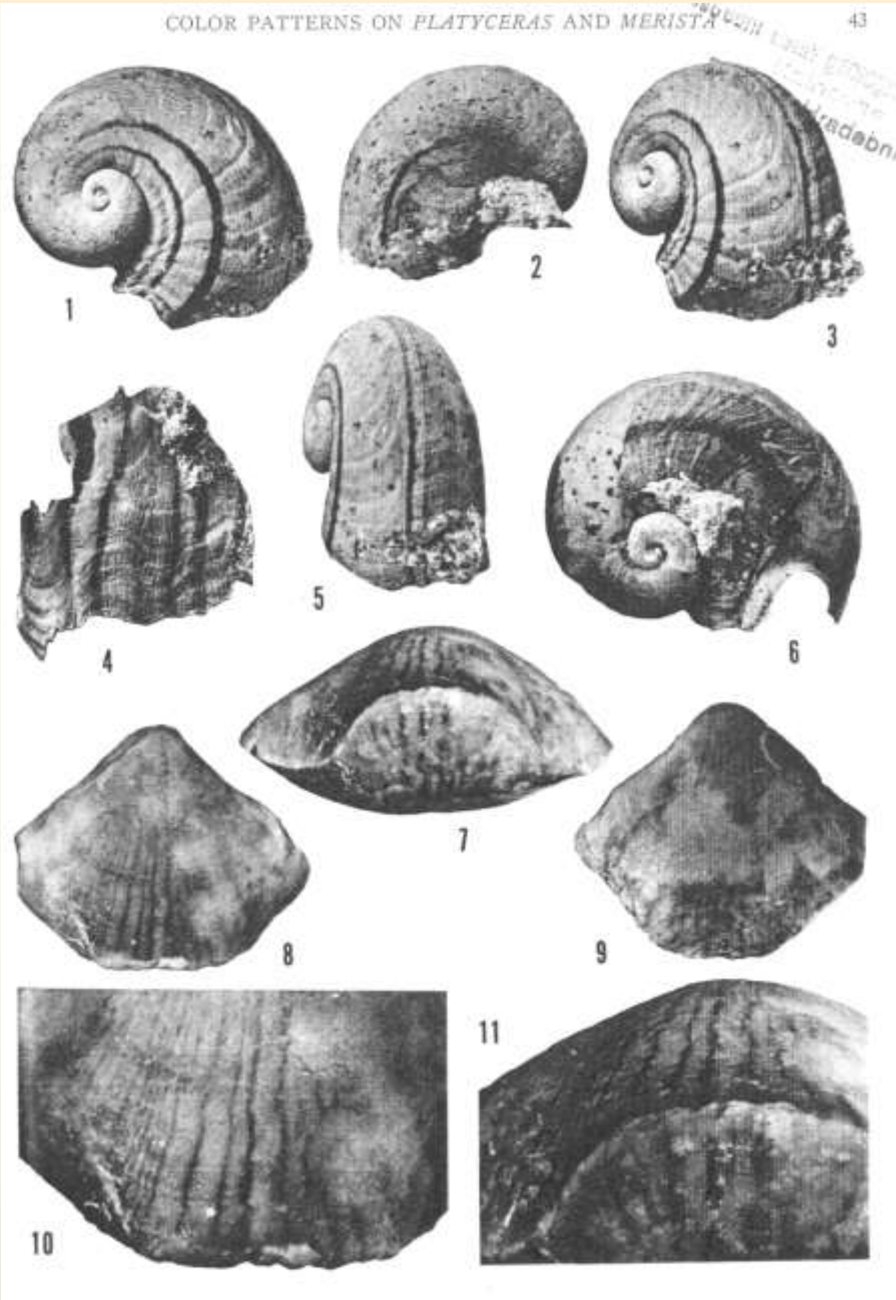
Initial plant diversification and dispersal event in upper Silurian of the Prague Basin

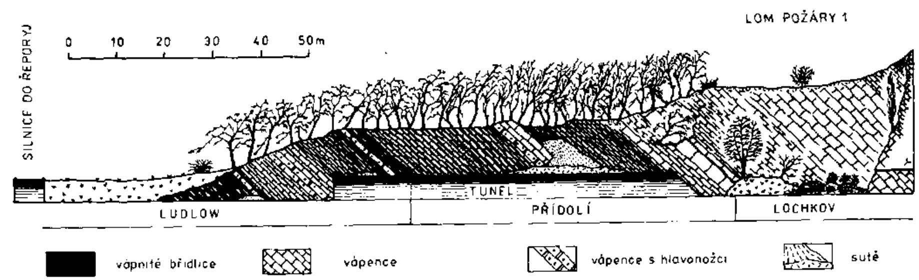
1. Introduction





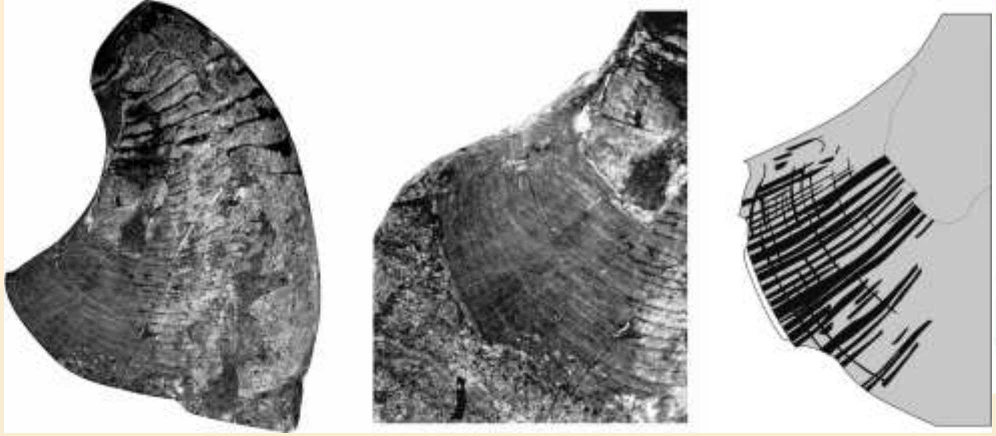
Moderní výzkum obratlovců siluru a devonu pražské pánve – Vaškaninová (2020), Vaškaninová a P. Ahlberg (2017), Vaškaninová et al. (2020), Vaškaninová a Kraft (2014a,b), Mergl et al. (2014) a další publikace





Defilé stratotypu požárského (přídolského) souvrství na Požárech u Řeporyj. Hranice ludlow—přídolí je v tomto profilu definována mezinárodním hraničním stratotypem přídolí [vrstva č. 96, ležící 196 cm nad bází požárského (přídolského) souvrství]

Barvy na schránkách: *Platyceras deceptivum* (Kříž a Lukeš 1974), Požáry



Phragmoceras imbricatum Barrande, 1865; ludlow, gorst, zóna *C. colonus*; Butovice, Na Břekvici, kopaninské souvrství

Oonoceratidní hlavonožec *Richardsonoceras forbesi* (Barrande, 1866). Kopaninské s., ludlow, ludford, Kosov

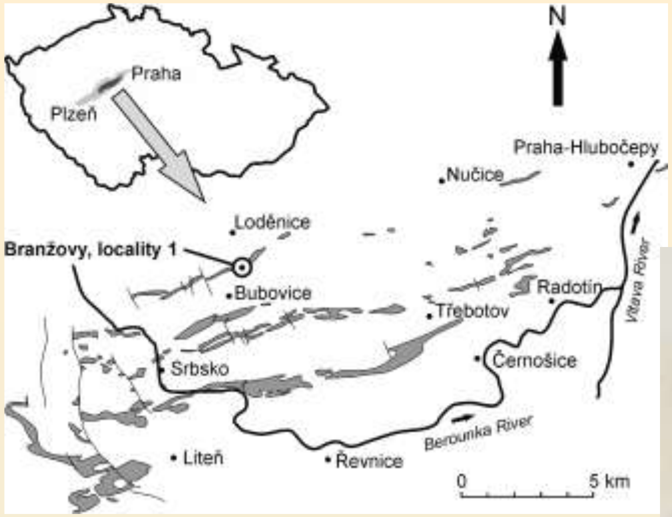
Hexameroceras panderi (Barrande, 1865), Ludlow, nejvyšší ludford, Praha - Velká Chuchle

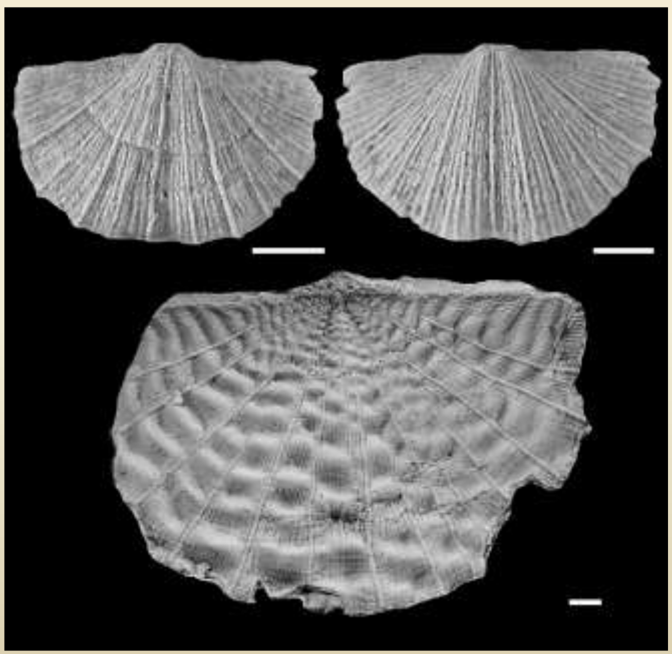
Peismoceras pulchrum (Barrande, 1865), Ludlow, raný gorst, Butovice - Na Břekvici, kopaninské souvrství

Oonoceras sp. Kopaninské souvrství, ludlow,ludford, Beroun – Dlouhá hora

Manda a Turek (2009a,b), 2015
Turek a Manda (2011, 2020)
aj.

Barvy na schránkách: cephalopoda





Mergl a Nolčová (2016) – Kotýské vápence, Branžovy

Response of organophosphatic brachiopods to the mid-Ludfordian (late Silurian) carbon isotope excursion and associated extinction events in the Prague Basin (Czech Republic)

Michal Mergl, Jiří Frýda & Michal Kubajko

The present paper represents the first results of an on-going multidisciplinary study focused on the response of marine faunas to the mid-Ludfordian (late Silurian) carbon isotope excursion and associated extinction events (Ludfordian, late Silurian). The paper describes the stratigraphical distribution of organophosphatic brachiopods from the uppermost part of the *Neocucullograptus inexpectatus* to lower part of *Monograptus parultimus* graptolite biozones (*i.e.* early Ludfordian to earliest Přídolí). Numerical analysis of the stratigraphical distribution, based on more than 1300 determinable valves of 15 organophosphatic brachiopod species, revealed three groups being significantly supported. They are here formalized as new organophosphatic brachiopod communities: the oldest *Opsiconidion ephemerus* Community, the *Kosoidea fissurella* Community, and the youngest *Opsiconidion parephemerus-Kosagittella clara* Community. The *Opsiconidion ephemerus* Community and the *Opsiconidion parephemerus-Kosagittella clara* Community have distinct similarities in their taxonomic composition, moderate species diversity and low dominance indices. The communities are separated by the monospecific *Kosoidea fissurella* Community present just after the Lau and Kozlowskii bioevents during the period of high $\delta^{13}C$ values which is interpreted as an opportunistic community. Re-occurrence of some brachiopod taxa after the bioevents and the mid-Ludfordian carbon isotope excursion raises the question, at least for organophosphatic brachiopods, as to the extent to which the Lau and Kozlowskii bioevents represent true global extinction events and whether their significance has not been overestimated. Two new species are erected: *Opsiconidion bouceki* and *Opsiconidion parephemerus*. • Key words: mid-Ludfordian carbon isotope excursion, Lau and Kozlowskii bioevents, Silurian, organophosphatic brachiopods, Barrandian, new taxa.

Mergl, M., Frýda, J. & Kubajko, M. 2018. Response of organophosphatic brachiopods to the mid-Ludfordian (late Silurian) carbon isotope excursion and associated extinction events in the Prague Basin (Czech Republic). *Bulletin of Geosciences 93(3)*, 369–400 (11 figures, 2 tables). Czech Geological Survey, Prague. ISSN 1214-1119. Manuscript received April 15, 2018; accepted in revised form July 3, 2018; published online August 6, 2018; issued August 20, 2018.

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The Silurian Period represents a rather unusual period in Earth history. During the last two decades several distinct and rapid changes in the Silurian global carbon cycle have been recognized. These geochemical events were closely linked to major crises in marine ecosystems as well as to palaeoclimatic changes (see Munnecke *et al.* 2003, Loydell 2007, Calner 2008, for reviews). The largest magnitude perturbation in the Silurian global carbon cycle, named the mid-Ludfordian carbon isotope excursion (CIE) by Kaljo *et al.* (1997), has been considered also to represent the largest carbon isotope excursion throughout the whole Phanerozoic and the second largest in Earth history (Munnecke *et al.* 2003). On the other hand, the mid-Ludfordian CIE was preceded only by moderate faunal crises referred to as the Lau conodont Bioevent (Jeppsson 1987), Kozlowskii graptolite Bioevent (Urbanek 1993), and Pentamerid Bioevent (Talent *et al.* 1993). The mid-Ludfordian CIE and the associated faunal turnover have been documented from many palaeocontinents, in particular from different areas of Baltica (see Kaljo *et al.* 1996, 1997, 2007, 2014; Calner 2008; Eriksson *et al.* 2009; Jeppsson *et al.* 2012; Kozłowski & Munnecke 2010; Kozłowski & Sobień 2012; Younes *et al.* 2016; Spirodonov *et al.* 2017), Australia (Talent *et al.* 1993;

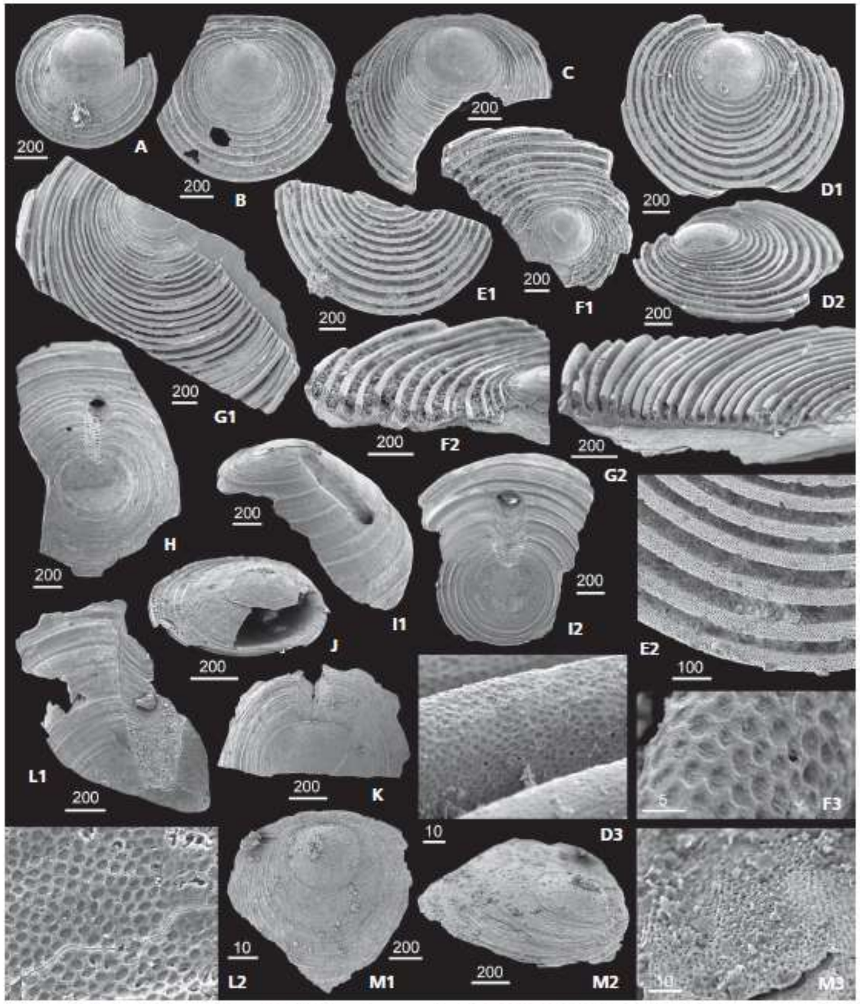
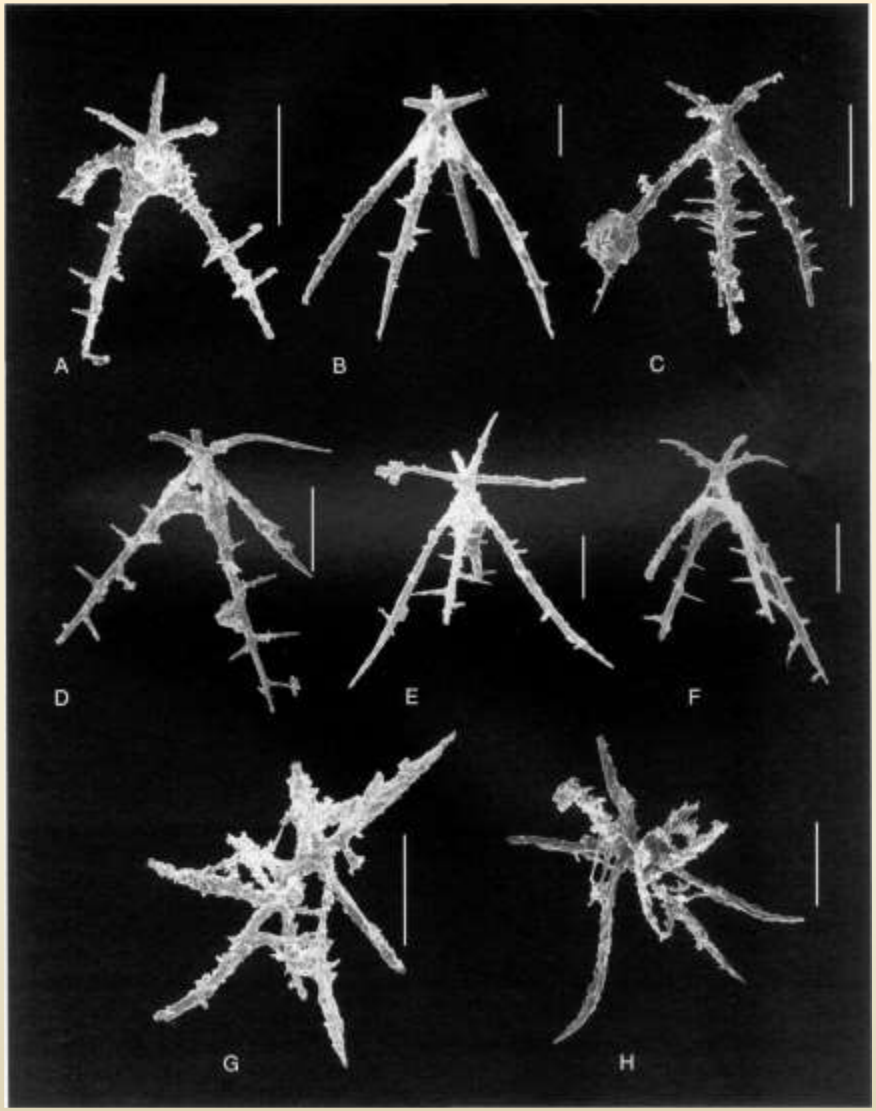
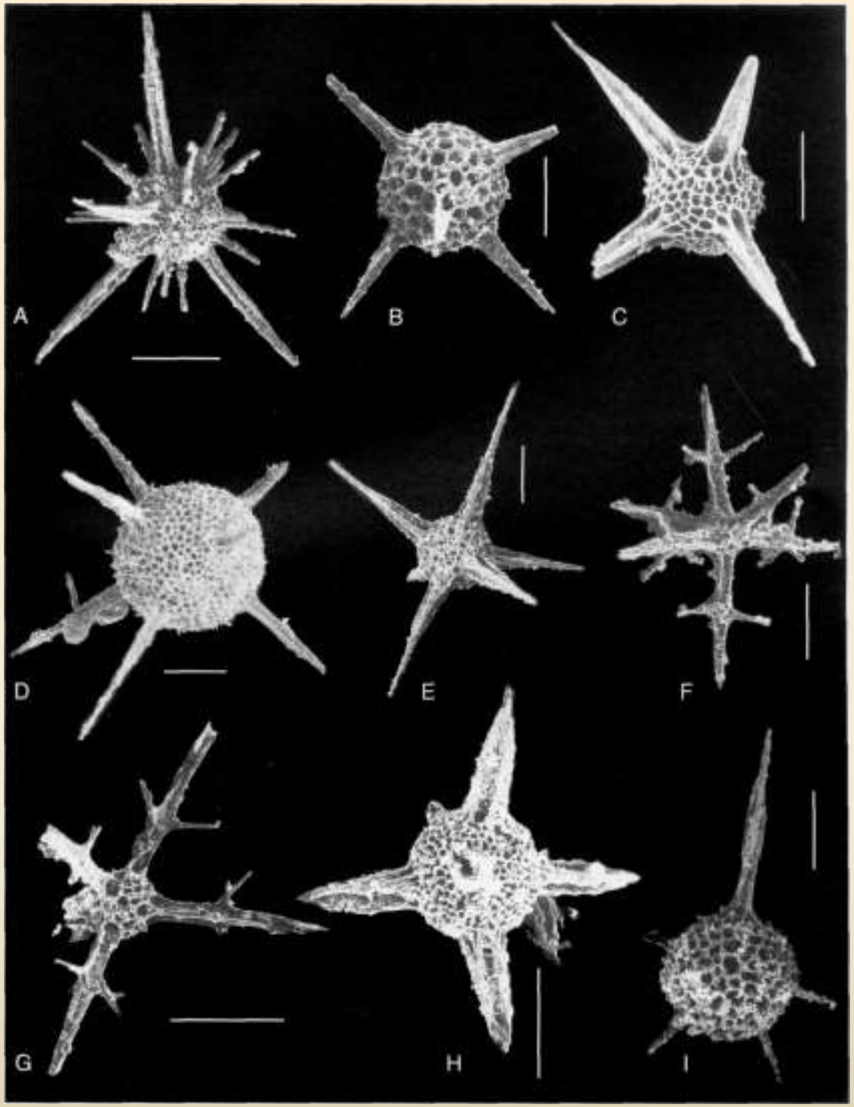


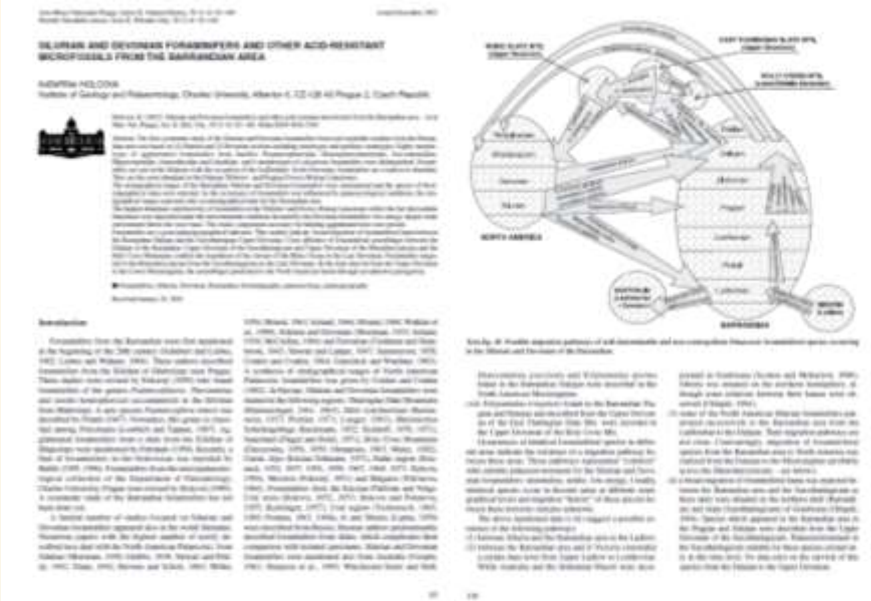
Figure 5. A–K – *Chynithele vexata* (Barrande, 1879), Kosov Quarry, samples K2 (A, B), K8 (D, F, H, I, J), K10 (C, E, G, K); A – exterior of small dorsal valve, JF195_30; B – exterior of dorsal valve, JF195_31; C – exterior of dorsal valve, JF195_5; D – exterior of dorsal valve (1), its anterodorsal view (2) and detail of its microornament (3), JF195_79; E – exterior of large incomplete dorsal valve (1), and its microornament (2), JF195_6; F – exterior of large incomplete dorsal valve (1), detail of ornament (2), and its microornament (3), JF195_81; G – exterior of incomplete dorsal valve (1), detail of ornament (2), JF195_7; H – exterior of incomplete ventral valve, JF195_82; I – exterior of incomplete ventral valve (2), and its posterolateral view (1), JF195_83; J – complete small shell, JF195_86; K – exterior of incomplete ventral valve, JF195_8. • L – *Acrosaccus* sp. A, Kosov Quarry, sample K10. Exterior of incomplete ventral valve (1) and its microornament (2), JF195_9. • M – *Acrosaccus* sp. B; Kosov Quarry, sample K8. Exterior of incomplete ventral valve (1), its laterodorsal view (2) and its microornament (3), JF195_84. Length of bars in μm.

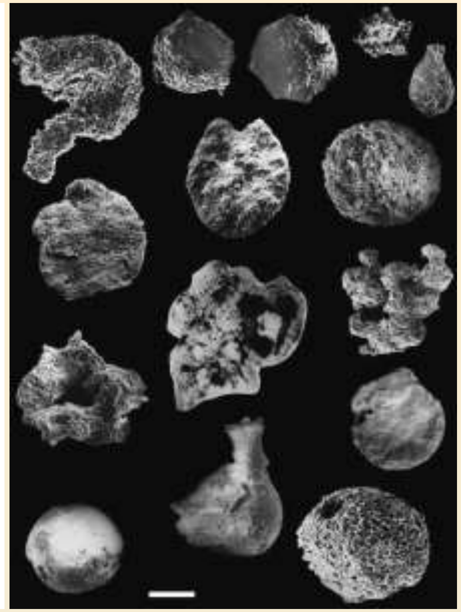
M. Mergl – vývoj metodiky rozpouštění organofosfatických a silicifikovaných organických zbytků





Radiolárie: **P. Čejchan (MS)**; Budil (1995), Braun & Budil (1999)


SILURIAN AND DEVONIAN FORAMINIFERS AND OTHER ACID-RESISTANT MICROFOSSILS FROM THE BARRANDIAN AREA




Palaeogeography, Palaeoclimatology, Palaeoecology

The morphogroups of small agglutinated foraminifers from the Devonian carbonate complex of the Prague Synform (Barrandian area, Czech Republic)

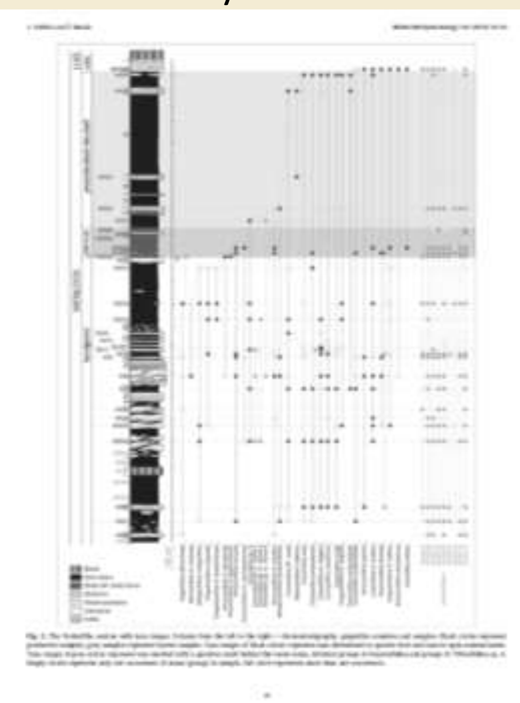
Výzkum foraminifer – K. Holcová

Výzkum chitinozoí – F. Paris, P. Dufka; J. Vodička


Marine Micropaleontology

A taxonomical and statistical study of chitinozoan distribution across the lundgreni Event (Wenlock, Silurian) from the Prague Basin, Czech Republic: A specific pattern driven by ecological changes

Jakub Vodička, Štěpán Manda



Silurian carcinosomatid eurypterids from the Prague Basin (Czech Republic)

Petr Budil, Štěpán Manda & Odd Erik Tetlie

The eurypterid record from the Prague Basin includes occasional Ludlow faunas, but in the uppermost Silurian (Přídolí) eurypterids suddenly become common in relatively deep water facies. Pterygotids clearly dominate these late Silurian faunas, whereas carcinosomatids are represented by the single species *Eusarcana acrocephala*, known from only a few specimens. This species is revised and its validity is discussed herein. A new eurypterid fauna found in deep water shale facies is described from the lower and middle part of the Motol Formation, Wenlock, Sheinwoodian–Homerian, *Cyrtograptus murchisoni* to *C. lundgreni* graptolite biozones, at Praha-Lochkov. It consists of common fragments of the carcinosomatid eurypterid described here as *Eusarcana*? sp. A and rare possible pterygotid fragments. This is the earliest evidence of carcinosomatids outside Laurentia and one of the earliest records of the group worldwide. This early occurrence outside a hypothetical Laurentian evolutionary centre is discussed with respect to the palaeobiogeography of other faunas colonising peri-Gondwanan basins after the decline of widespread early Silurian anoxia. A previous suggestion that carcinosomatids (presumed basal members of the Carcinosomatoidea) had similar distribution patterns to pterygotoids is discussed. Eurypterids migrated into the peri-Gondwanan realm from the tropical zone, but the dispersion potential of carcinosomatids into the temperate and cool water realm was probably lower than that of pterygotids. In the Prague Basin, the carcinosomatid-dominated fauna of the Wenlock age was replaced in the late Silurian by a pterygotid-dominated fauna. • Key words: Eurypterida, Carcinosomatidae, Prague Basin, Wenlock, Přídolí.

Budil, P., Manda, Š. & Tetlie, O.E. 2014. Silurian carcinosomatid eurypterids from the Prague Basin (Czech Republic). *Bulletin of Geosciences 89(2)*, 257–267 (7 figures). Czech Geological Survey, Prague. ISSN 1214-1119. Manuscript received April 19, 2013; accepted in revised form January 6, 2014; published online March 11, 2014; issued May 19, 2014.

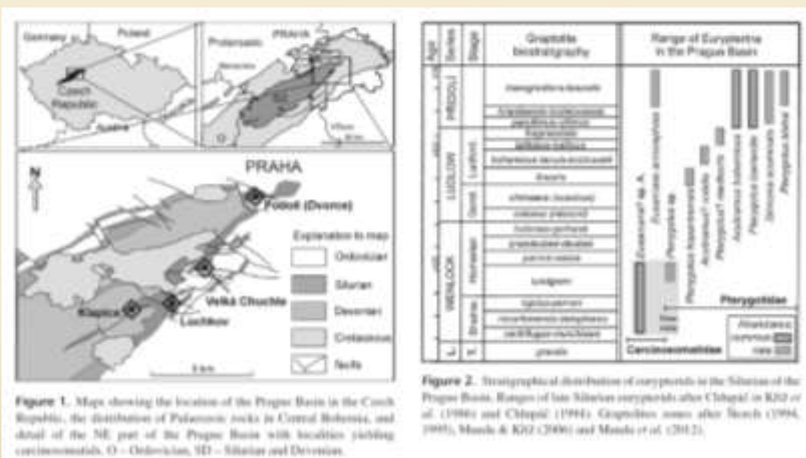
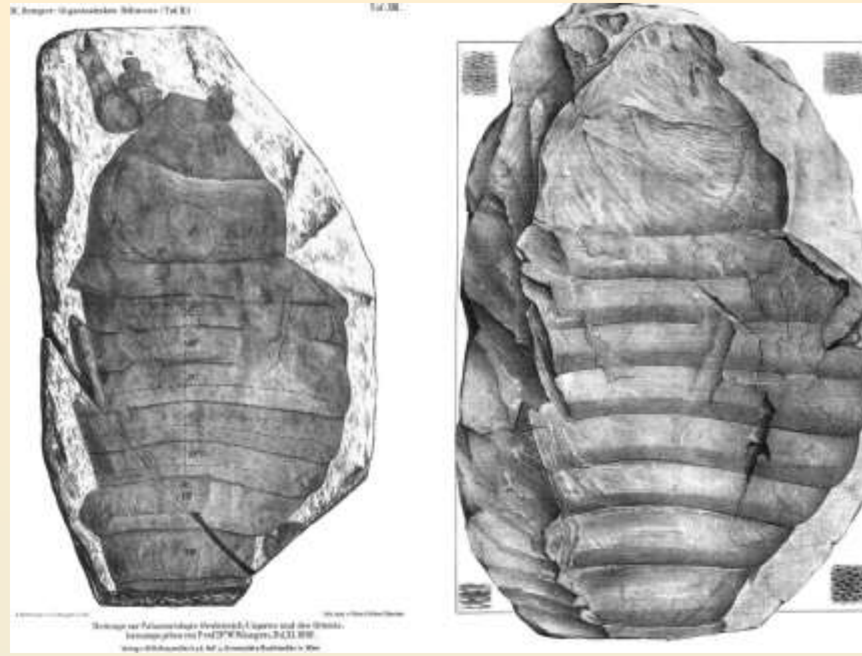
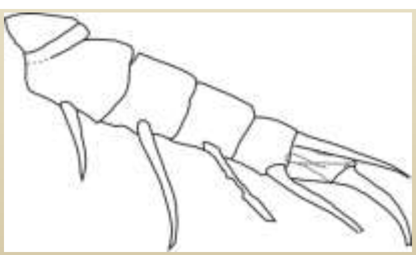
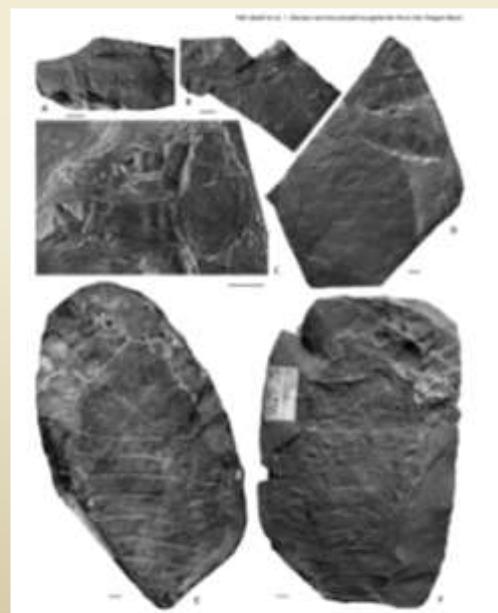


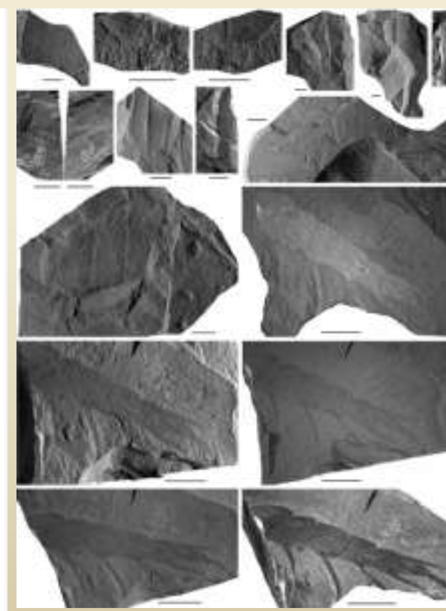
Figure 1. Maps showing the location of the Prague Basin in the Czech Republic, the distribution of Palaeozoic rocks in Central Bohemia, and detail of the NE part of the Prague Basin with localities yielding carcinosomatids. O – Ordovician, SD – Silurian and Devonian.

Figure 2. Stratigraphical distribution of eurypterids in the Silurian of the Prague Basin. Ranges of late Silurian eurypterids after Chlupáč in Kříž et al. (1986) and Chlupáč (1994). Graptolites zones after Štorch (1994, 1995), Manda & Kříž (2006) and Manda et al. (2012).

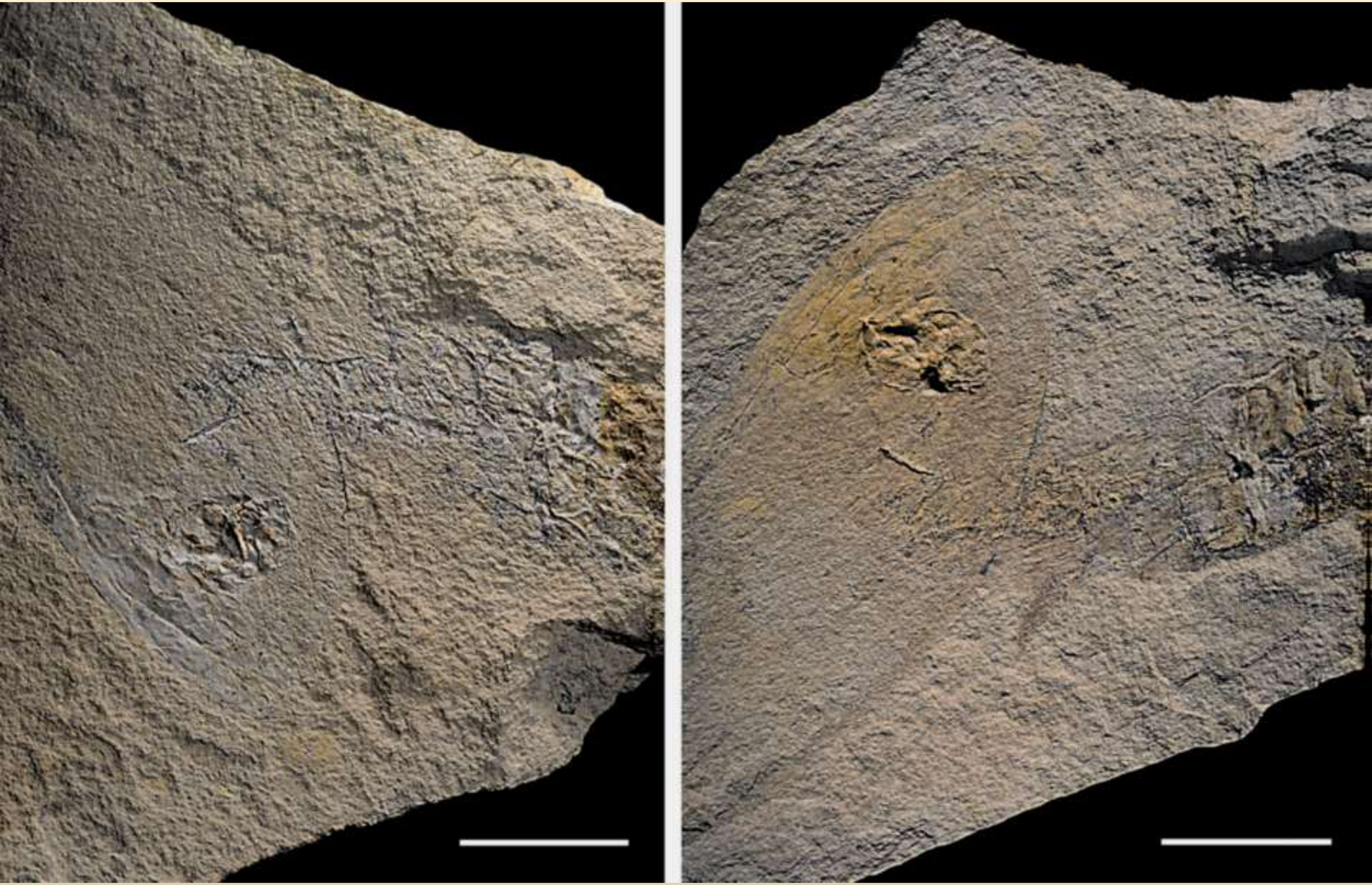








Výskyt eurypteridů již v motolském souvrství (Budil et al. 2010)



Ceratiocaris papilio (Salter *in* Murchison, 1859) v pražské pánvi
Mandibuly a trupové končetiny zachované *in-situ* (Budil et al. 2010)

Významný český mezinárodní impaktovaný časopis – vlajková loď české paleontologie

Bulletin of Geosciences
(= Věstník ústředního ústavu geologického)

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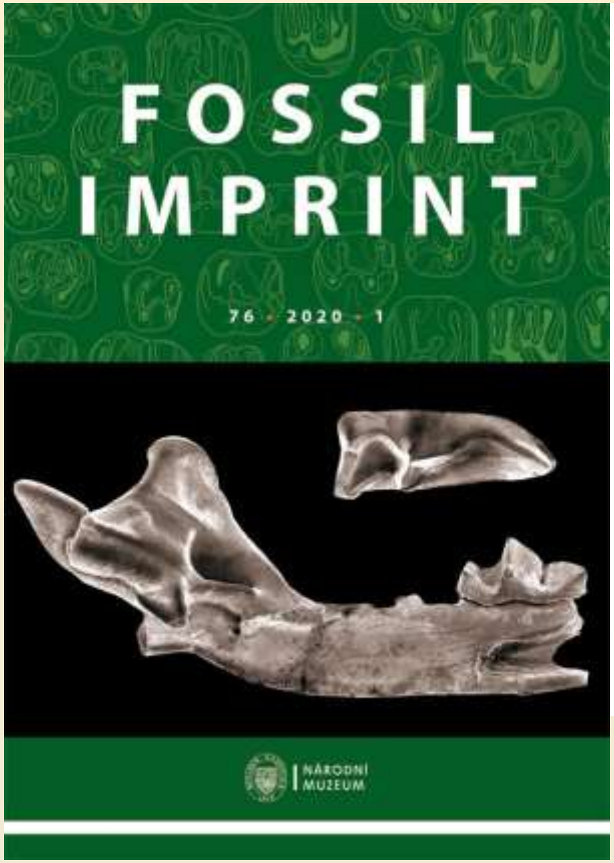

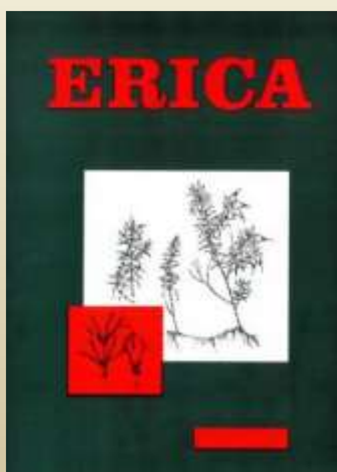

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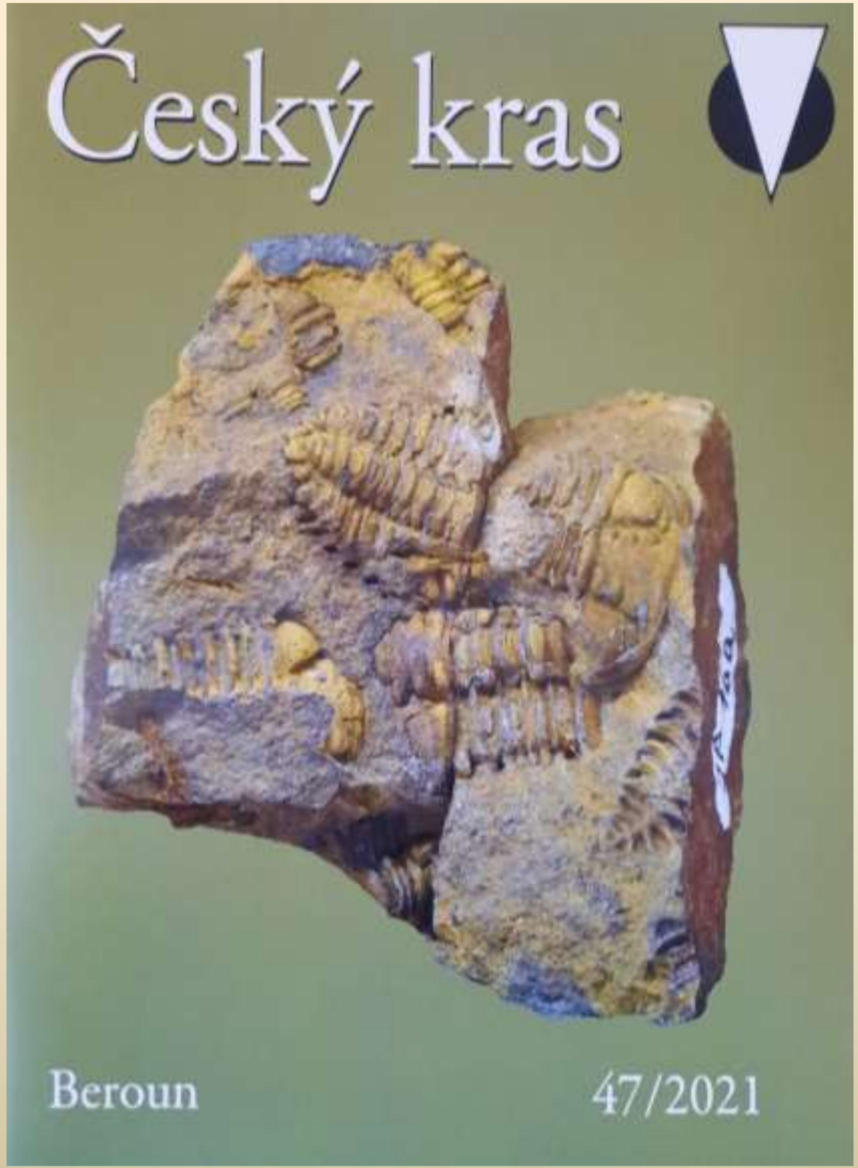

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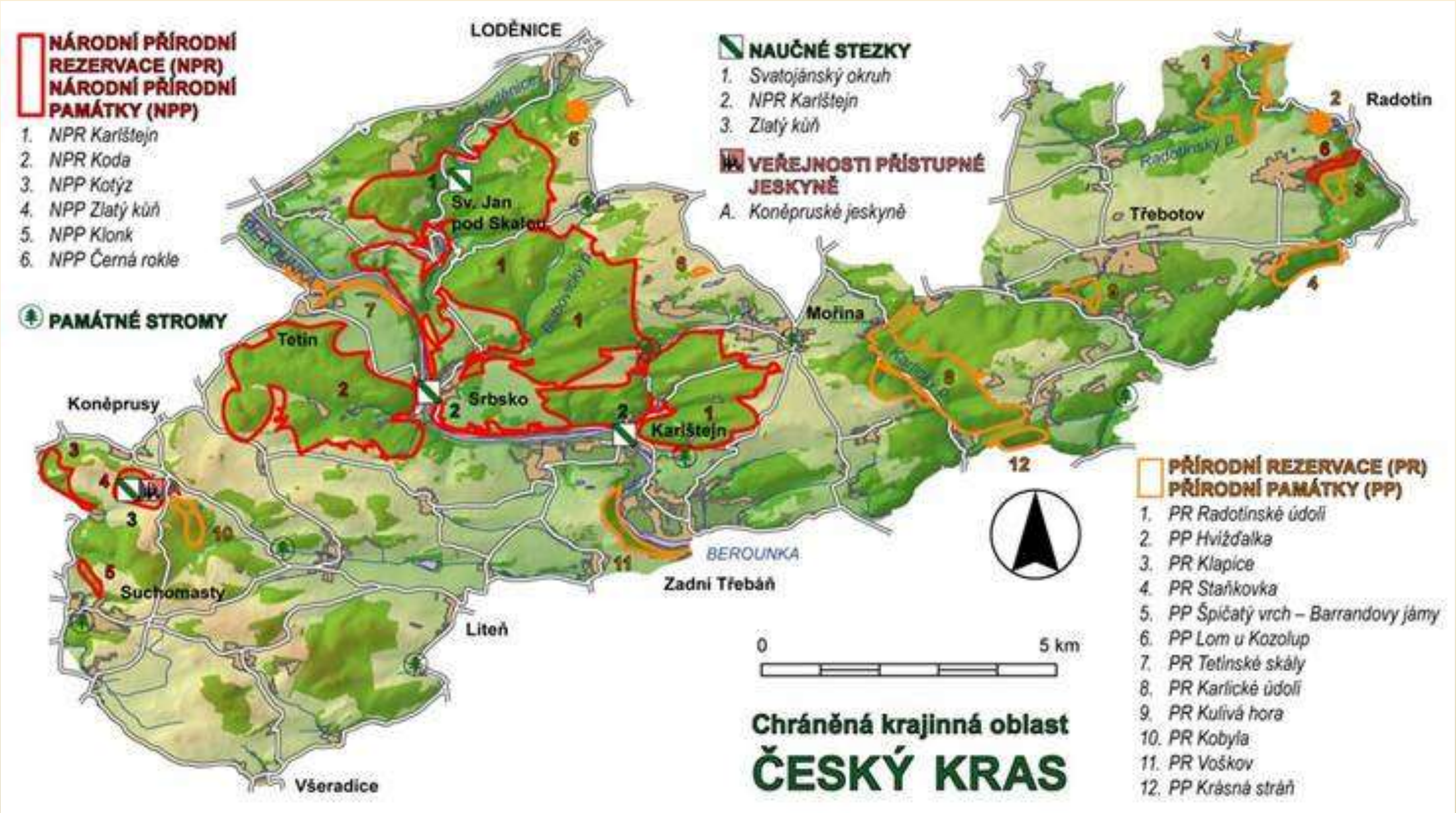

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