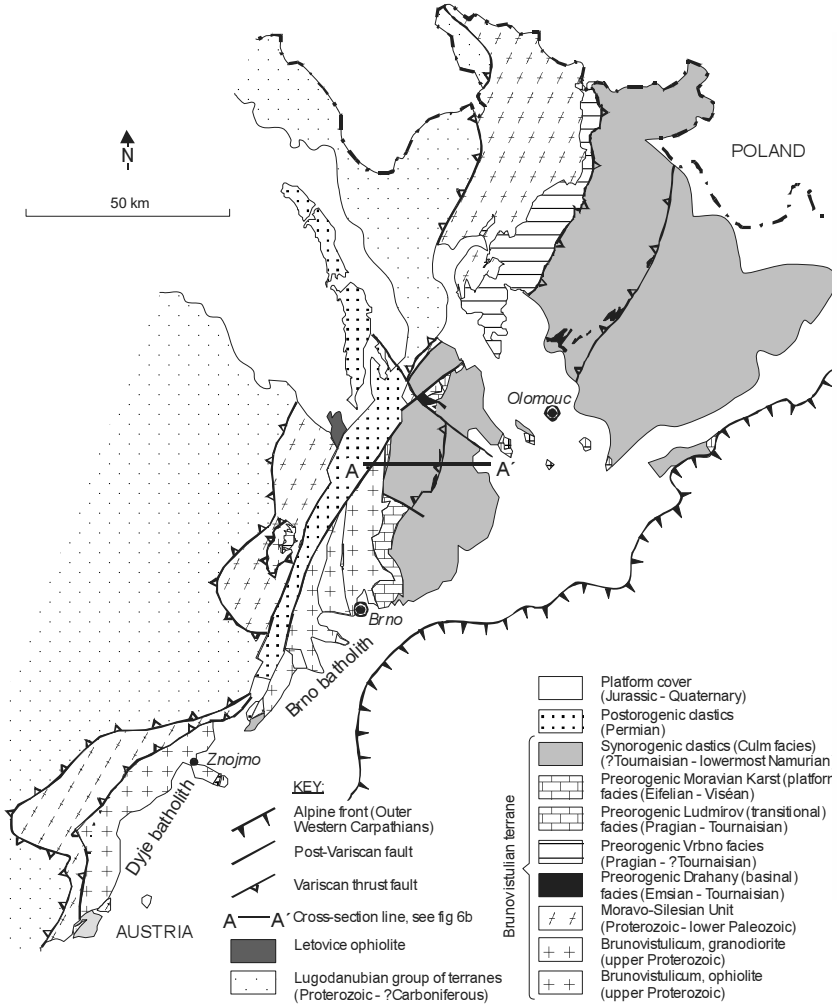
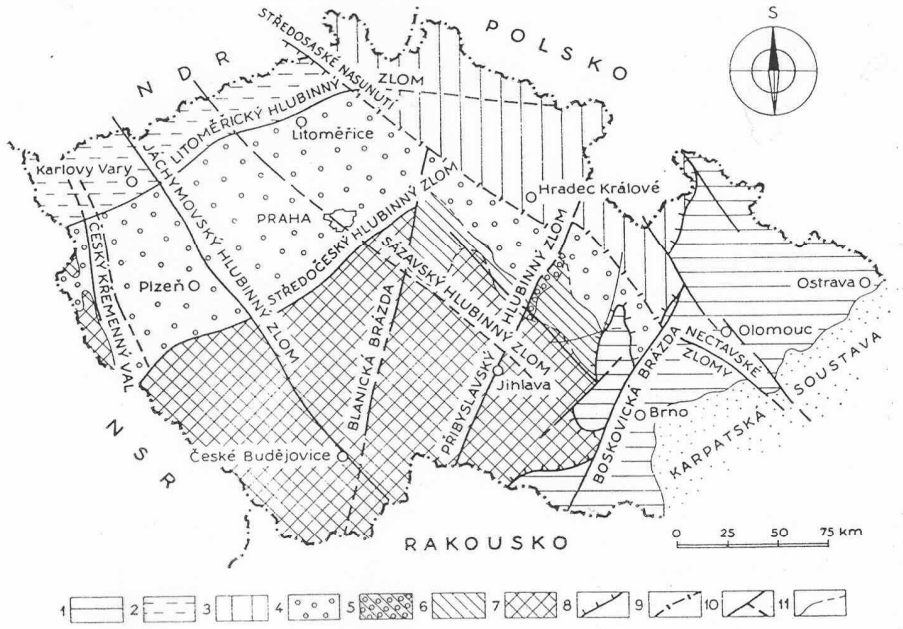
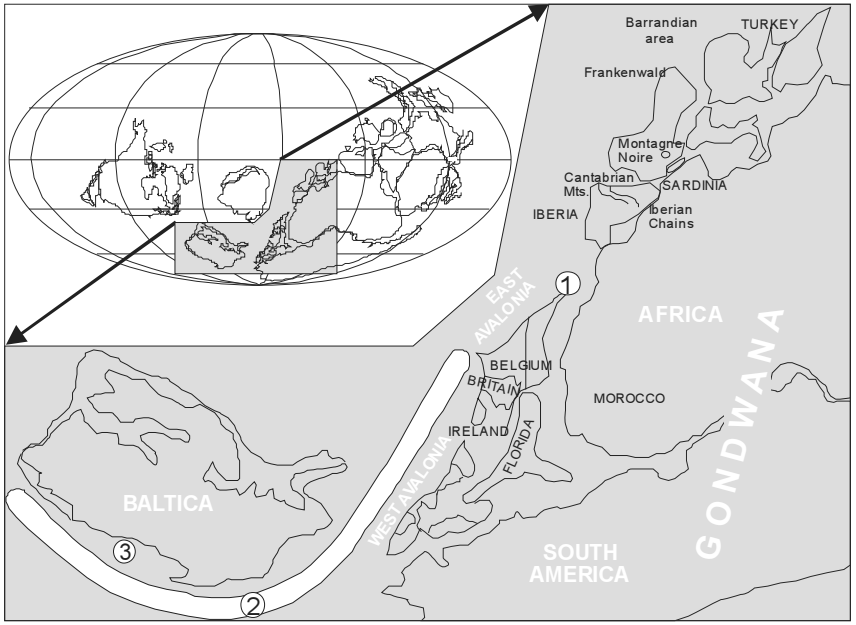



Základní rozdělení Českého masívu na oblasti na území ČSSR a nomenklatura používaná dále v textu (orig.); 1 moravskoslezská oblast, 2 krušnohorská oblast, 3 lugická oblast, 4 středočeská oblast, 5 hlinská zóna středočeské oblasti, 6 kutnohorsko-svratecká oblast, 7 moldanubická oblast, 8 moravskoslezské zlomové pásmo, 9 jižní okraj lugické oblasti, 10 základní zlomy důležité pro vymezení oblastí, 11 hranice oblastí

# Cambrian

**Basal clastic Formation** – originally regarded all as Devonian in age. Lower Cambrian acritarchs in Boreholes in SE Moravia Měnín, Němčičky). Shallow marine, hard to distinguish from Devonian – same provenance of clastic material.




Early Cambrian position of the Brunovistulian terraner

## Ordovician

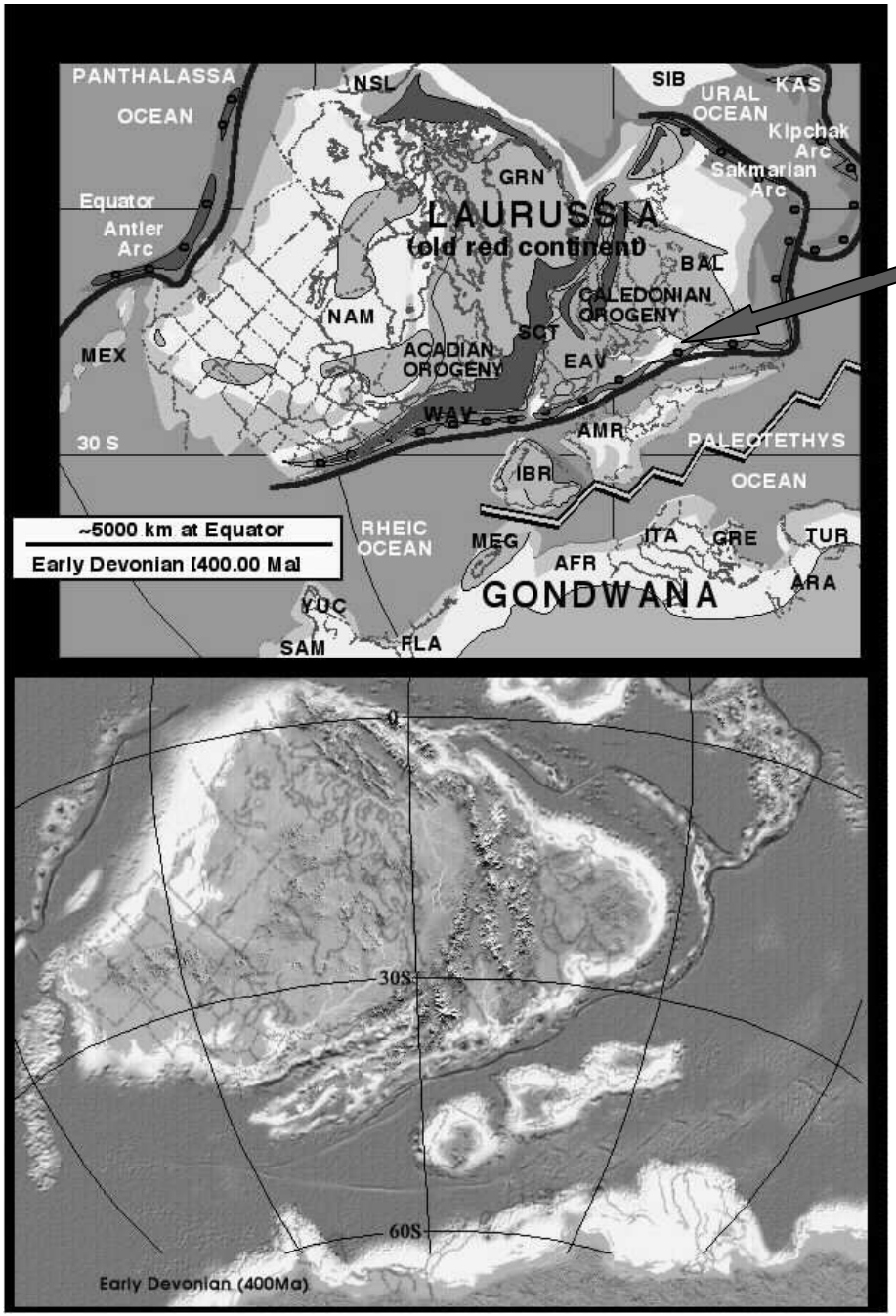
Rare occurrence in boreholes in tle northern part of Brunovistulicum in Poland, not found in ČR

## Silurian

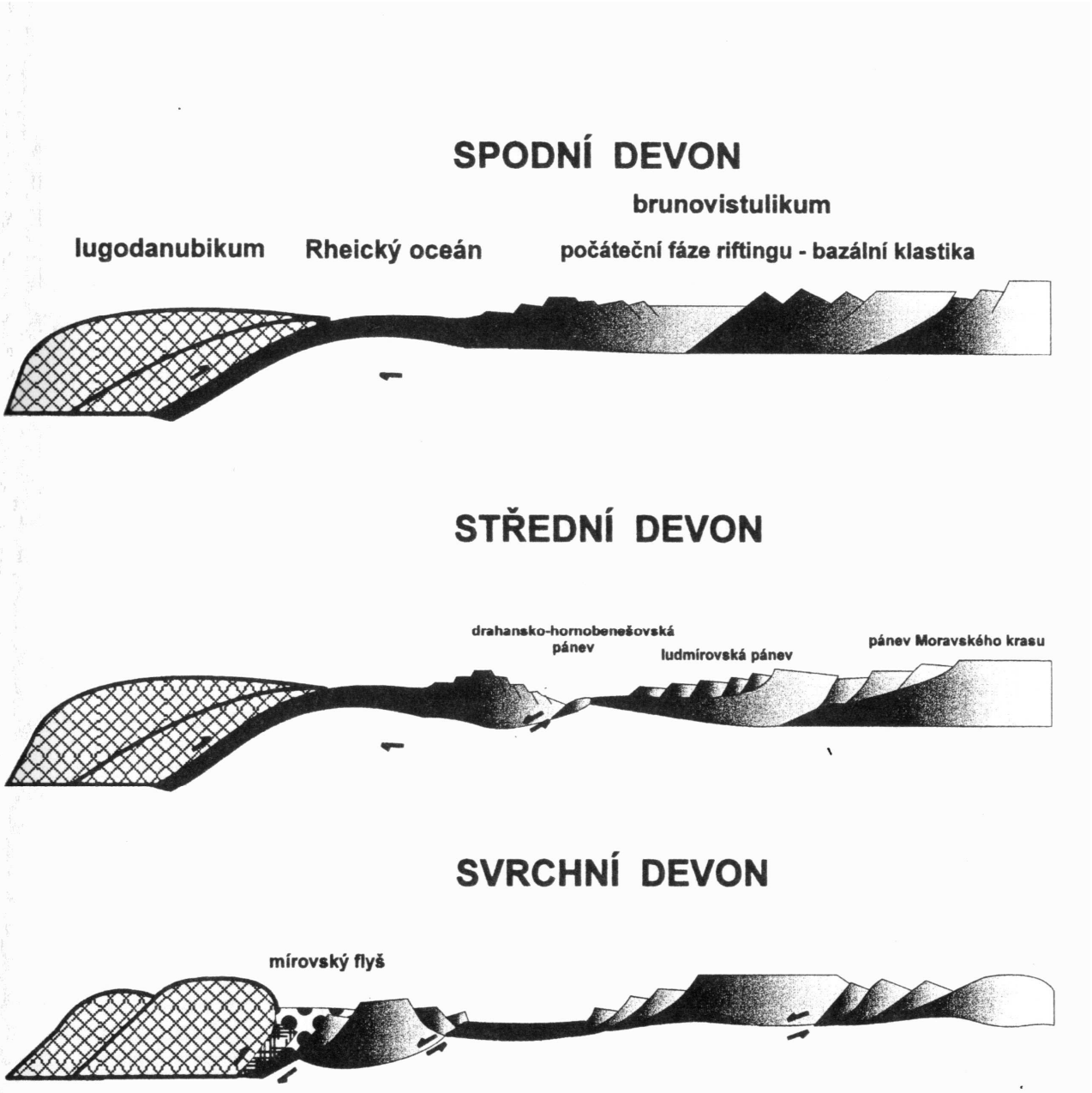
Only Stínava near Prostějov, grey shales with limestone intercalations, strongly tectonized between the Devonian and Culm sediments, Llandovery-přídolí. Graptolites. Problematic occurrences in crystalline units of Silesicum (Branna Group)

# Devonian
# (preorogenic sedimentation)

Drahany development
Vrbno development
Ludmírov development
Moravian Karst development
Tišnov Development




Brunovistulian terrane




**Obr. 47.** Model vývoje devonských transtenzních pánví na brunovistulickém jižním okraji Laurusie.

především břidlice s polohami radiolaritů, místy i s vložkami kalciturbiditů. Největší rozšíření

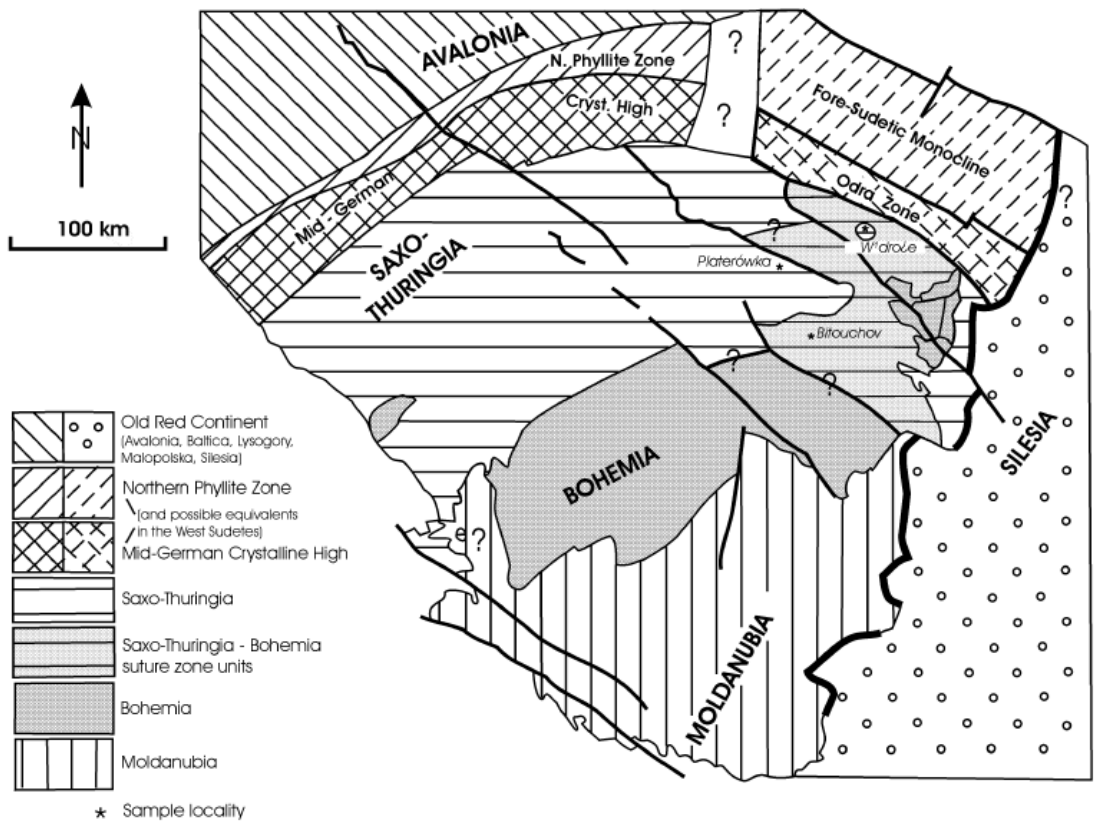
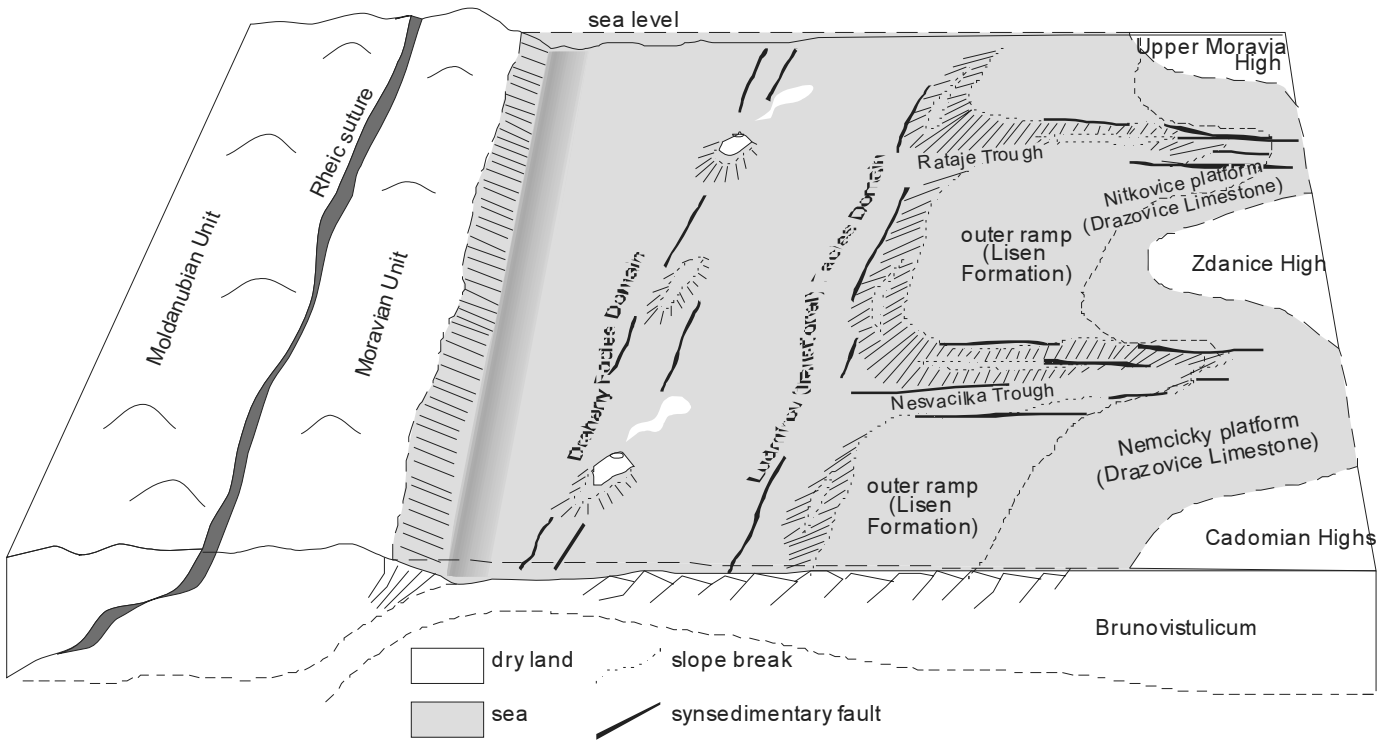
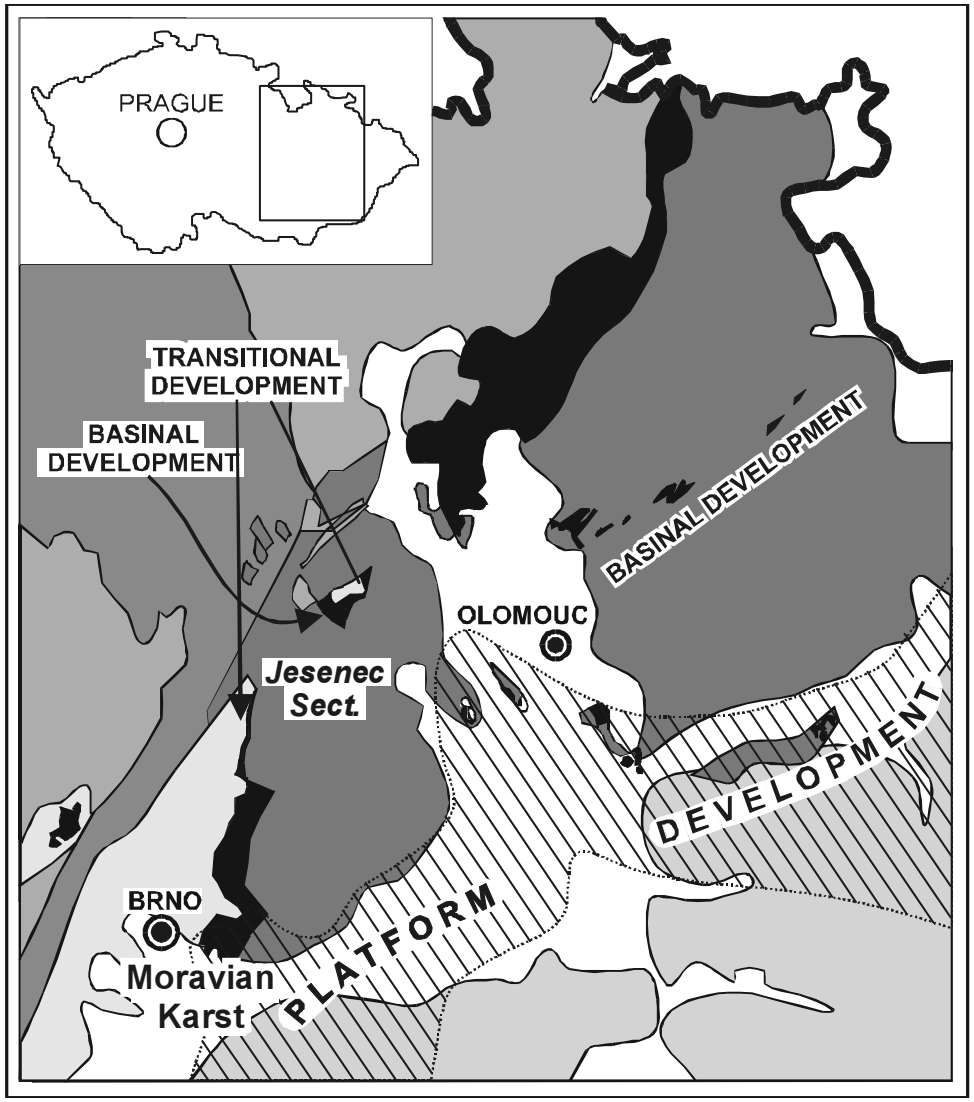
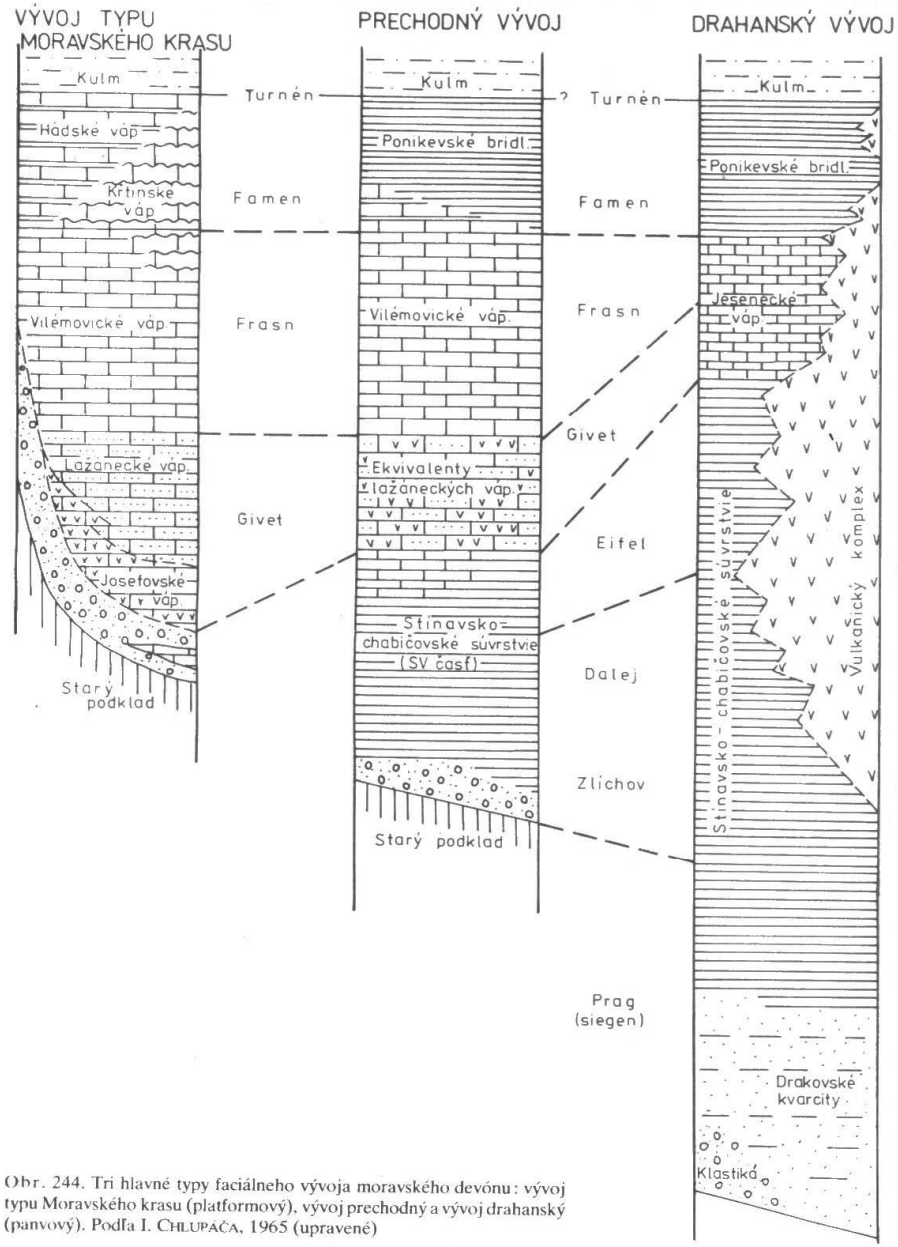


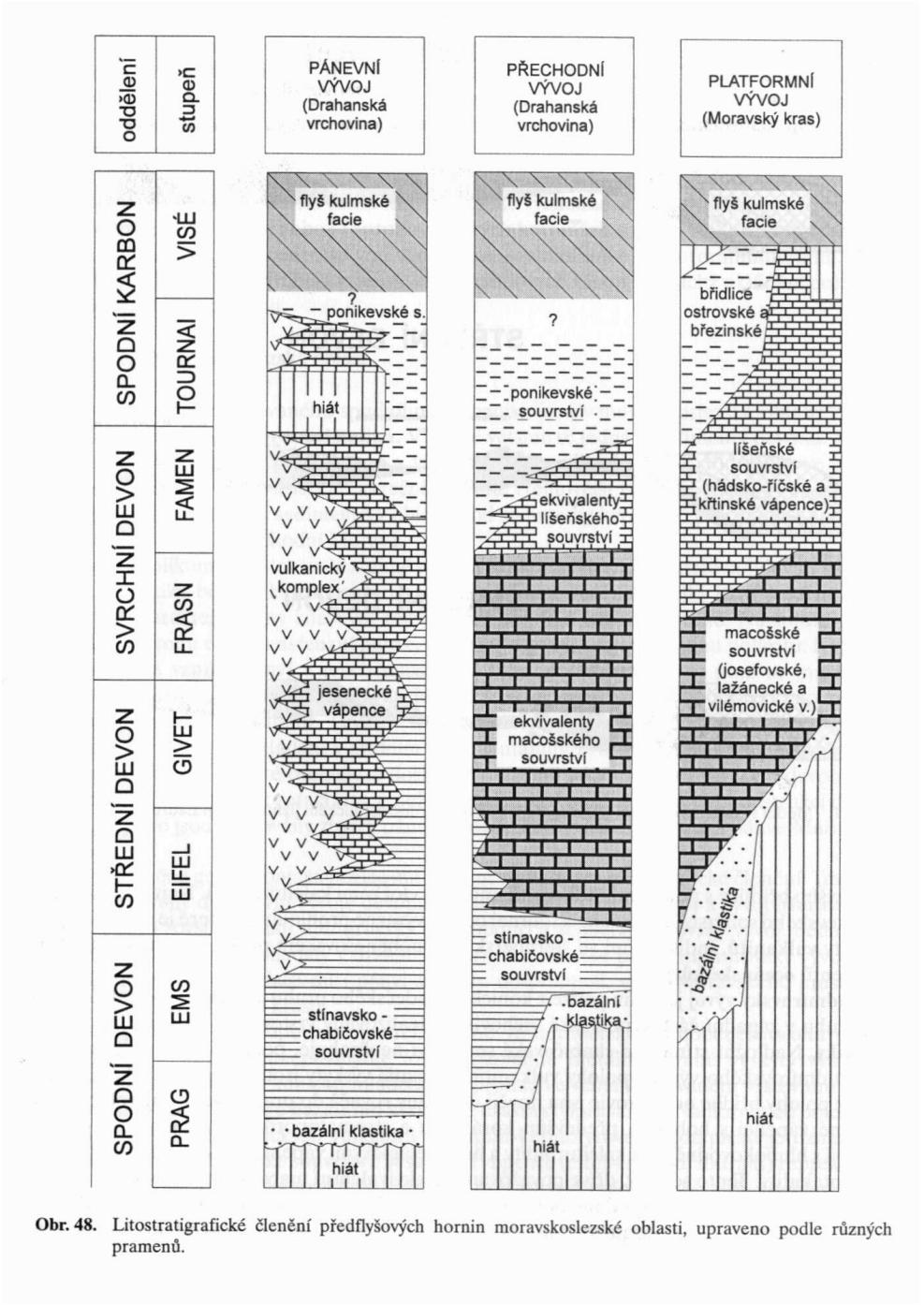

**Fig. 7** Schematic structural map of terranes in the Bohemian Massif


sea level
Upper Moravia High
Moldanubian Unit
Rheic suture
Moravian Unit
Drahany Facies Domain
Ludmirov (Hercynian) Facies Domain
Rataje Trough
Nitkovice platform (Drazovice Limestone)
outer ramp (Lisen Formation)
Zdanice High
Nesvacilka Trough
Nemcicky platform (Drazovice Limestone)
outer ramp (Lisen Formation)
Cadomian Highs
Brunovistulicum
dry land
sea
slope break
synsedimentary fault

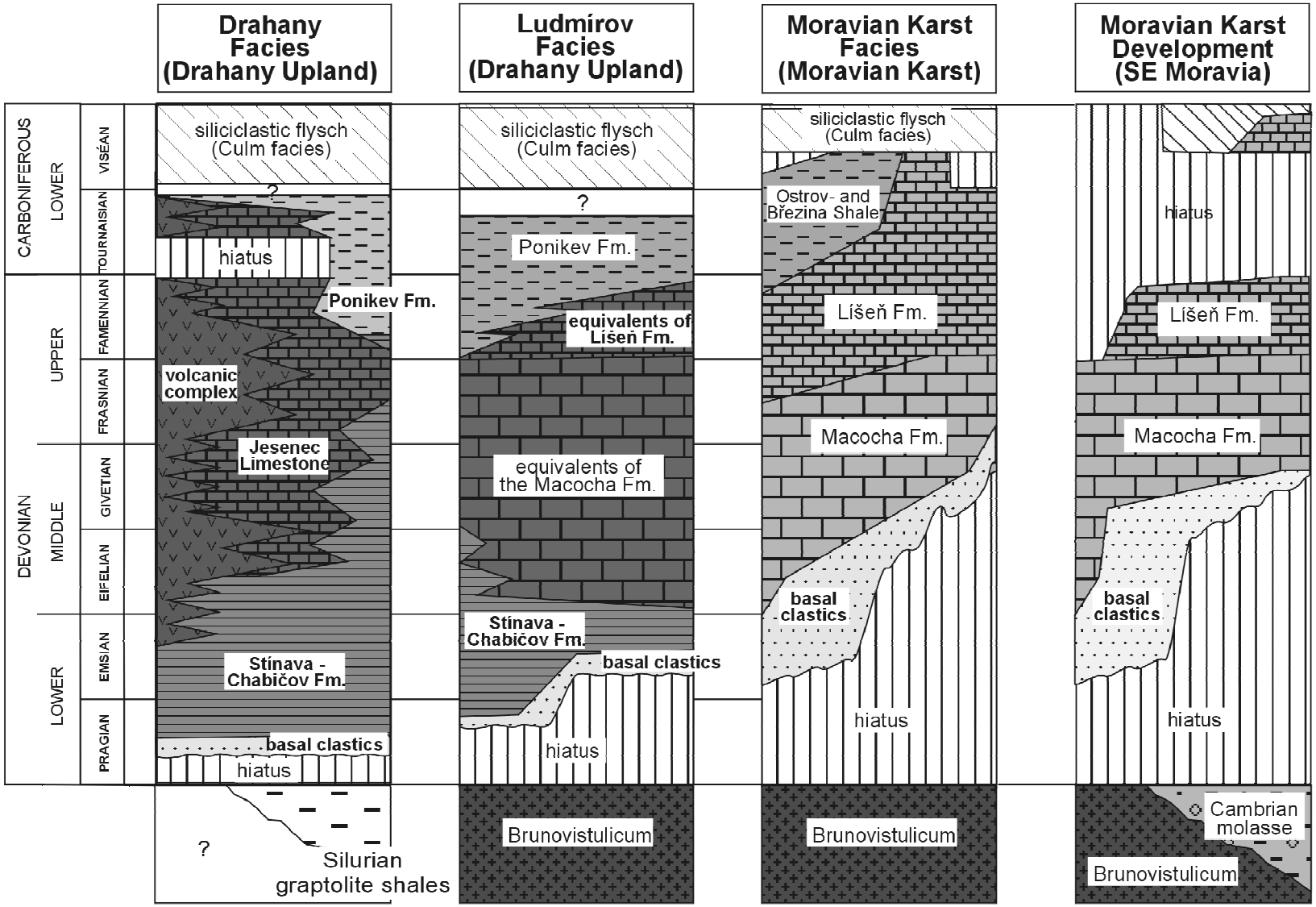

PRAGUE
TRANSITIONAL DEVELOPMENT
BASINAL DEVELOPMENT
BASINAL DEVELOPMENT
OLOMOUC
Jesenec Sect.
DEVELOPMENT
BRNO
Moravian Karst
PLATFORM
LEGEND:
Brunovistulian terrane (Laurussian basement)
Variscan crystalline rocks
Devonian - Lower Carboniferous pre-flysch rocks
Lower Carboniferous flysch (Culm facies)
Permian - Cretaceous sedimentary cover
Western Carpathian flysch
Neogene - Quaternary cover
Hypothetical subsurface limit of Platform Development
Section locations
Major city

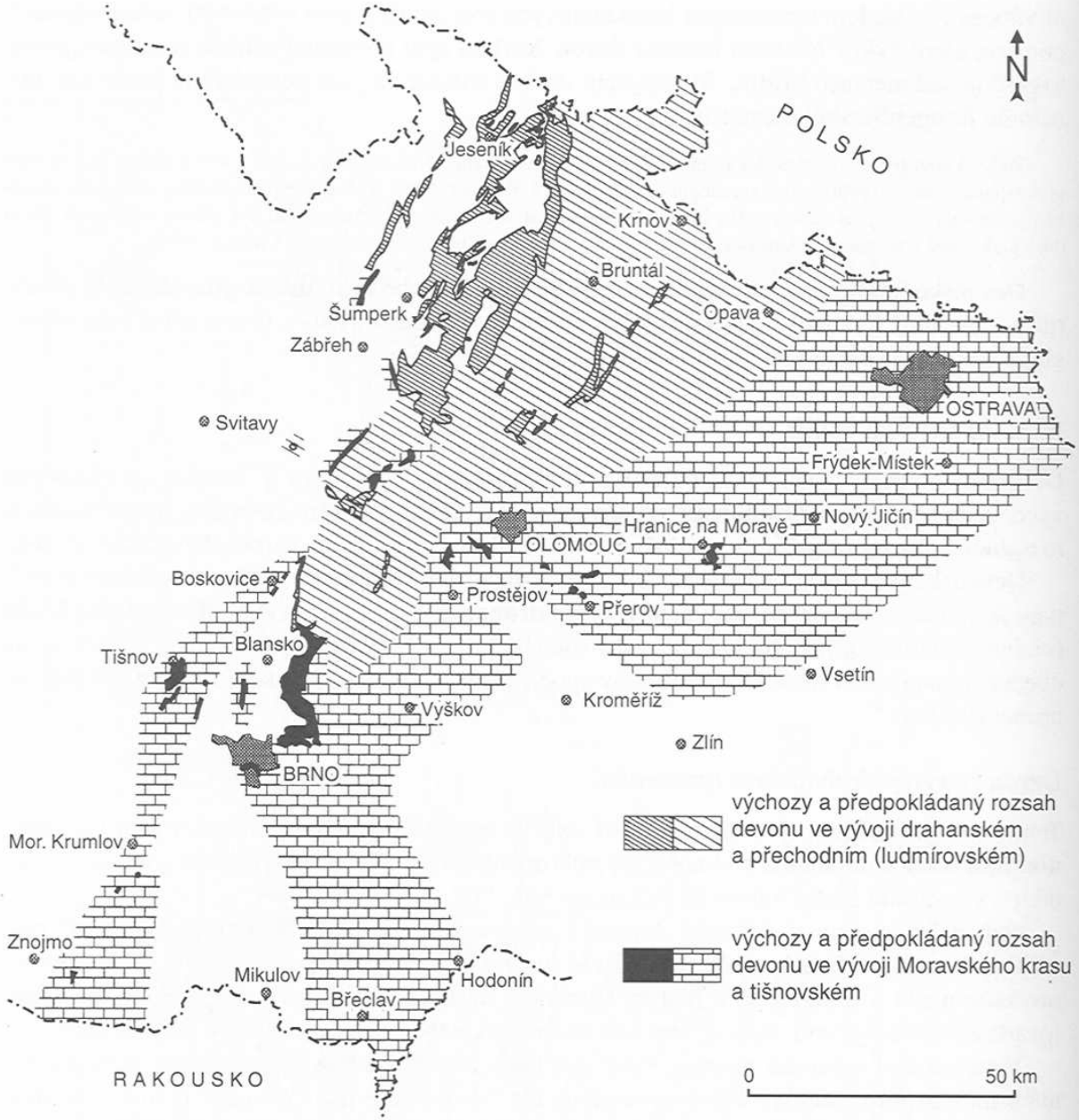



Obr. 244. Tri hlavné typy faciálneho vývoja moravského devónu: vývoj typu Moravského krasu (platformový), vývoj prechodný a vývoj drahanský (panvový). Podľa I. CHLUPÁČA, 1965 (upravené)

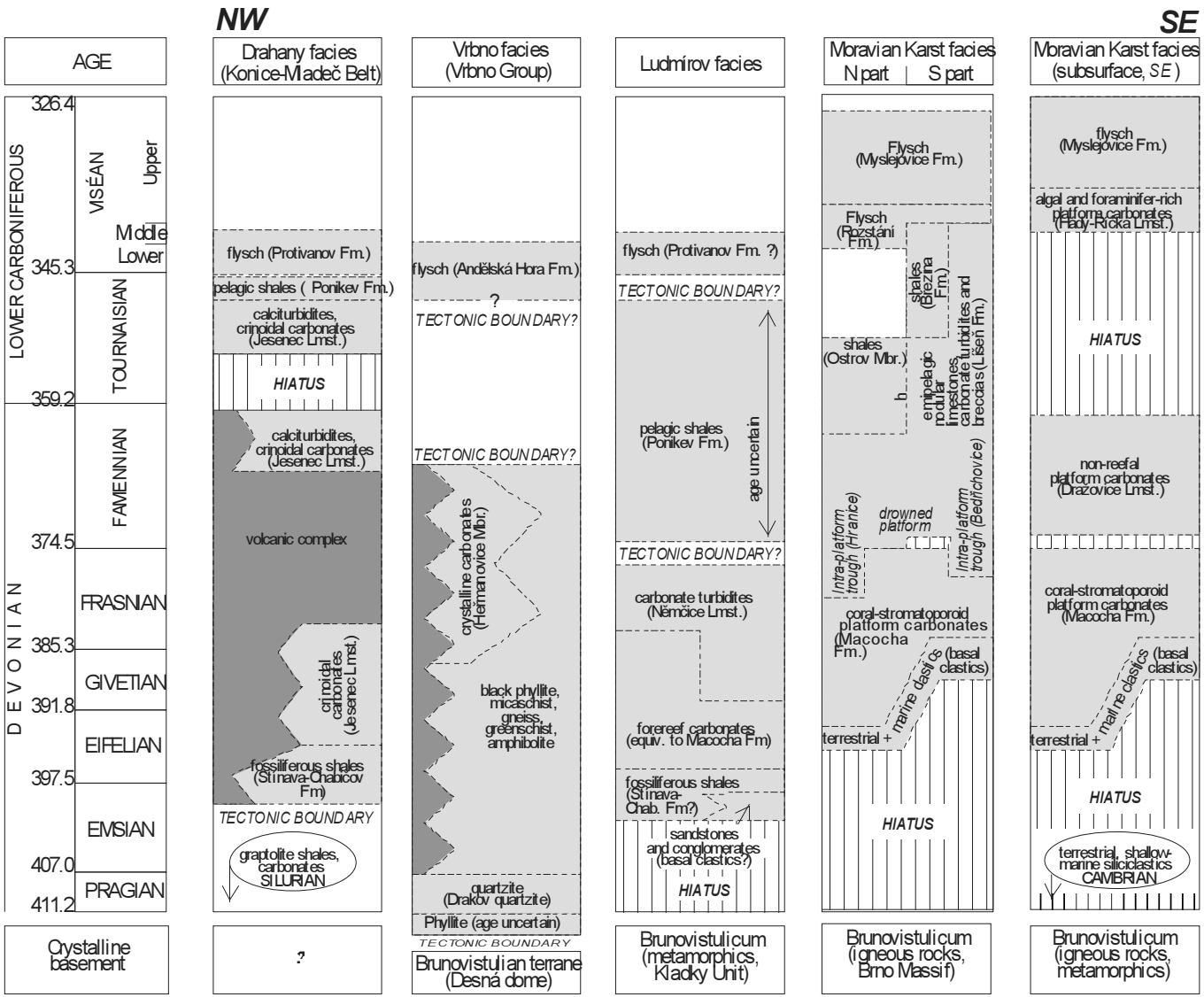



**Obr. 48.** Litostratigrafické členění předflyšových hornin moravskoslezské oblasti, upraveno podle různých pramenů.


Drahany Facies (Drahany Upland)
Ludmírov Facies (Drahany Upland)
Moravian Karst Facies (Moravian Karst)
Moravian Karst Development (SE Moravia)
CARBONIFEROUS
DEVONIAN
LOWER
UPPER
MIDDLE
LOWER
VISÉAN
TOURNAISIAN
FAMENNIAN
FRASNIAN
GIVETIAN
EIFELIAN
EMSIAN
PRAGIAN
siliciclastic flysch (Culm facies)
?
hiatus
Ponikev Fm.
volcanic complex
Jesenec Limestone
Stínava - Chabičov Fm.
basal clastics
hiatus
?
Silurian graptolite shales
siliciclastic flysch (Culm facies)
?
Ponikev Fm.
equivalents of Líšeň Fm.
equivalents of the Macocha Fm.
Stínava - Chabičov Fm.
basal clastics
hiatus
Brunovistulicum
siliciclastic flysch (Culm facies)
Ostrov- and Březina Shale
Líšeň Fm.
Macocha Fm.
basal clastics
hiatus
Brunovistulicum
hiatus
Líšeň Fm.
Macocha Fm.
basal clastics
hiatus
Cambrian molasse
Brunovistulicum




Obr. 96. Plošné rozšíření hlavních vývojů moravskoslezského devonu (silně zjednodušeno, I. Chlupáč 1988, 2000).


NW
SE
AGE
Drahany facies (Konice-Mladeč Belt)
Vrbno facies (Vrbno Group)
Ludmírov facies
Moravian Karst facies N part | S part
Moravian Karst facies (subsurface, SE)
LOWER CARBONIFEROUS
DEVONIAN
VISÉAN
Upper
Middle
Lower
TOURNAISIAN
FAMENNIAN
FRASNIAN
GIVETIAN
EIFELIAN
EMSIAN
PRAGIAN
326.4
345.3
359.2
374.5
385.3
391.8
397.5
407.0
411.2
flysch (Protivanov Fm.)
pelagic shales ( Ponikev Fm.)
calciturbidites, crinoidal carbonates (Jesenec Lmst.)
HIATUS
calciturbidites, crinoidal carbonates (Jesenec Lmst.)
volcanic complex
crinoidal carbonates (Jesenec Lmst.)
fossiliferous shales (Stinava-Chabicov Fm)
TECTONIC BOUNDARY
graptolite shales, carbonates SILURIAN
flysch (Andělská Hora Fm.)
?
TECTONIC BOUNDARY?
TECTONIC BOUNDARY?
crystalline carbonates (Hermanovice Mbr.)
black phyllite, micaschist, gneiss, greenschist, amphibolite
quartzite (Drahov quartzite)
Phyllite (age uncertain)
TECTONIC BOUNDARY
flysch (Protivanov Fm. ?)
TECTONIC BOUNDARY?
pelagic shales (Ponikev Fm.)
age uncertain
TECTONIC BOUNDARY?
carbonate turbidites (Němčice Lmst.)
forereef carbonates (equiv. to Macocha Fm)
fossiliferous shales (Stinava-Chab. Fm?)
sandstones and conglomerates (basal clastics?)
HIATUS
Flysch (Myslejovice Fm.)
Flysch (Rozstání Fm.)
shales (Březina Fm.)
shales (Ostrov Mbr.)
b
epipelagic nodular limestones, carbonate turbidites and breccias (Líšeň Fm.)
Intra-platform trough (Hranice)
drowned platform
Intra-platform trough (Bedřichovice)
coral-stromatoporoid platform carbonates (Macocha Fm.)
marine clastics (basal clastics)
terrestrial +
HIATUS
flysch (Myslejovice Fm.)
algal and foraminifer-rich platform carbonates (Hády-Říčka Lmst.)
HIATUS
non-reefal platform carbonates (Dražovice Lmst.)
coral-stromatoporoid platform carbonates (Macocha Fm.)
marine clastics (basal clastics)
terrestrial + marine clastics
HIATUS
terrestrial, shallow-marine siliciclastics CAMBRIAN
Crystalline basement
?
Brunovistulian terrane (Desná dome)
Brunovistulicum (metamorphics, Kladky Unit)
Brunovistulicum (igneous rocks, Brno Massif)
Brunovistulicum (igneous rocks, metamorphics)

## Vrbno (basinal) development

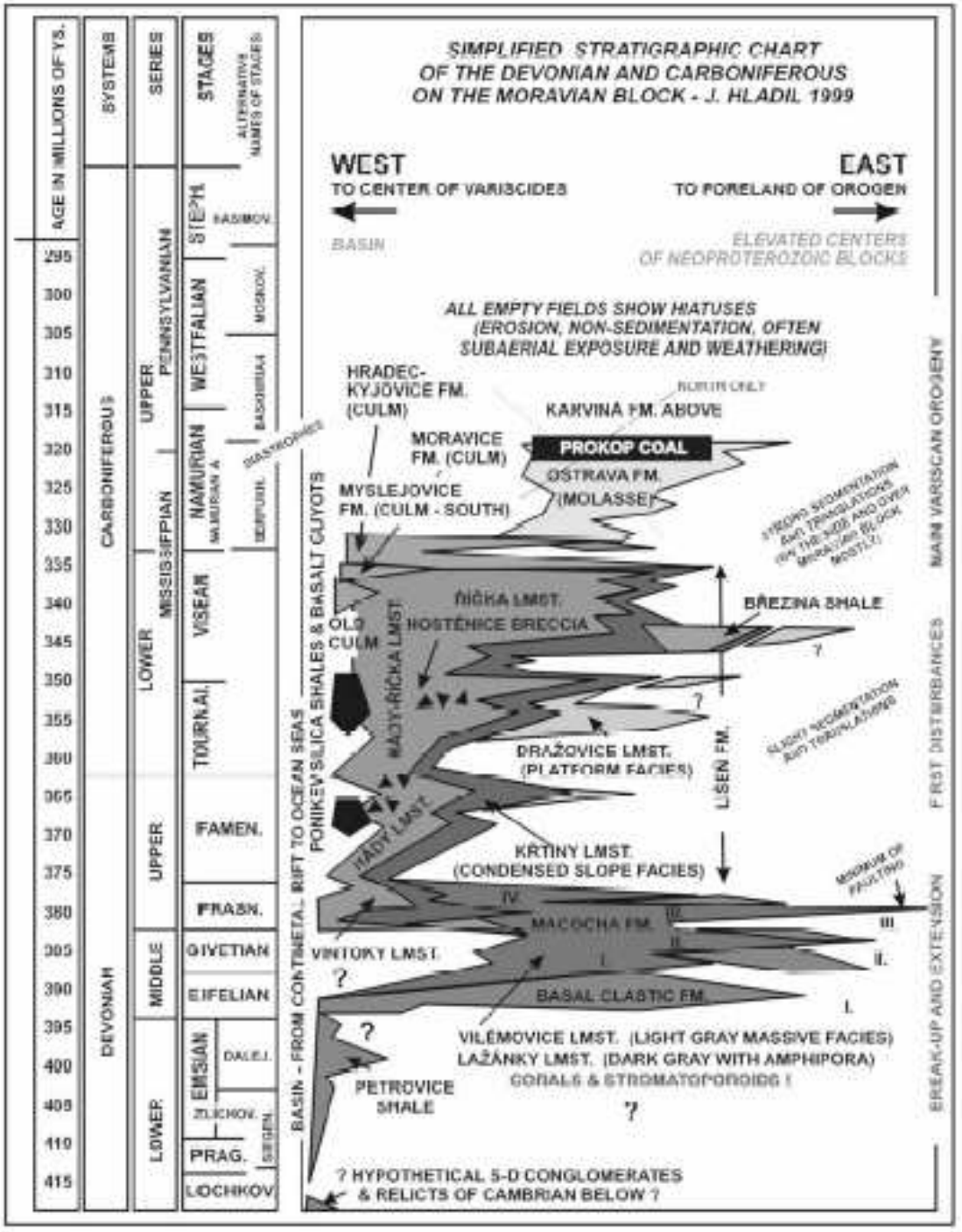
Vrbno Group – Hruby Jesenik Mts., more than 1000m. Basal phyllites overlain by Drakov quartzites. These metaquartzites contain early devonian fauna of brachiopods, tentaculites, bivalves, trilobites. Rhenish character. Metamorphosis up to tle garnet and staurolite zone.
Higher up phyllites and mica-schists with abundant basic and rare acid vulcanites. Final member – crystalline Heřmanovice Limestone -Givetian

## Drahany (basinal) development

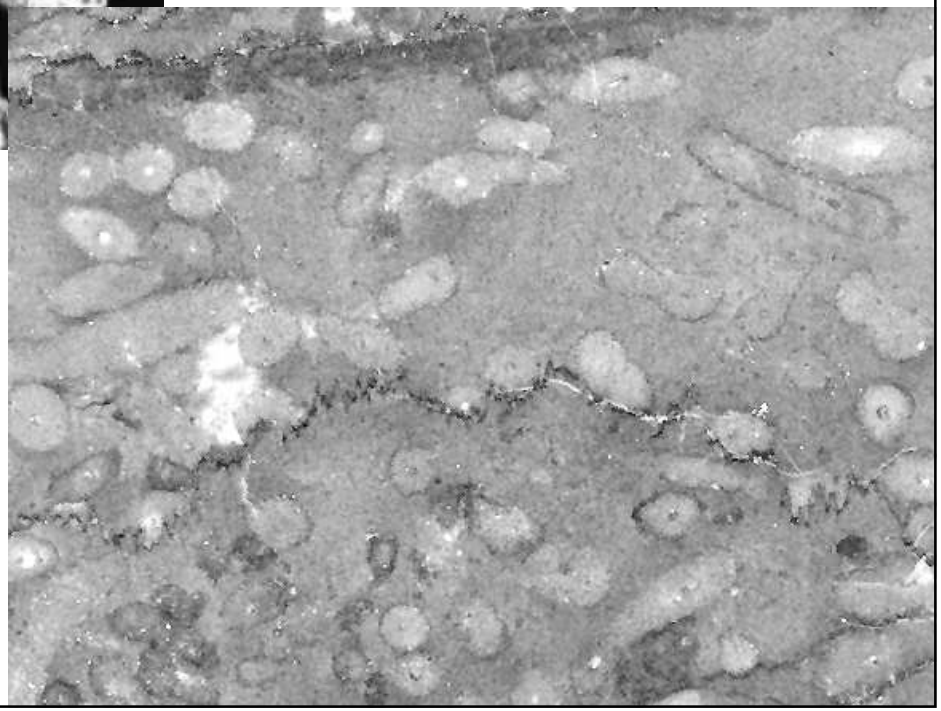
Drahany Upland, Šternberk-Hornobenešov belt.
Basal clastics – only Konice area, early Devonian fauna. Conlomerates, sandstones, sandy limestones
Stínava-Chabičov Formation, shales silty shales, basic vulcanites. Stinava Beds – early Devonian fauna.
Chabičov Beds – Emsian, Eifellian. Tentaculites, trilobites.
Jesenec Limestones – calciturbidites, middle Devonia- Tournaisian.
Ponikev Formation - shales, radiolarites. Frasnian to the uppermost Tournaisian
Volcanism – spilite-keratophyre, predominance of spilites, early Devonian to early Carboniferous.

## Ludmírov (transitional) Development

Basal clastic formation – quartz conglomerates passing to sandy limestones
Stínava-Chabičov Formation – rich fauna of trilobites, goniatites, bivalves, gastropods, corals etc. Similar lithology to Drahany development, no volcanites.
Equivalents of tle Macocha Formation, limestones with corals, srtromatoporoids
Alternating with calciturbidites and hemipelagic limestones.
Equivalents of Lišeň formation – Famennian
Ponikev Formation – shales with radiolarites, intercalations of limestones.


SIMPLIFIED STRATIGRAPHIC CHART
OF THE DEVONIAN AND CARBONIFEROUS
ON THE MORAVIAN BLOCK - J. HLADIL 1999
AGE IN MILLIONS OF YS.
SYSTEMS
SERIES
STAGES
ALTERNATIVE NAMES OF STAGES
WEST
TO CENTER OF VARISCIDES
EAST
TO FORELAND OF OROGEN
BASIN
ELEVATED CENTERS
OF NEOPROTEROZOIC BLOCKS
ALL EMPTY FIELDS SHOW HIATUSES
(EROSION, NON-SEDIMENTATION, OFTEN
SUBAERIAL EXPOSURE AND WEATHERING!
CARBONIFEROUS
DEVONIAN
UPPER PENNSYLVANIAN
LOWER MISSISSIPPIAN
UPPER
MIDDLE
LOWER
STEPH.
WESTFALIAN
NAMURIAN
VISEAN
TOURNAI.
FAMEN.
FRASN.
GIVETIAN
EIFELIAN
EMSIAN
PRAG.
LOCHKOV
BASHKIRIAN
MOSCOV.
BASHKIR.
SERPUKH.
DALEJ.
ZLICHOV.
SIEGEN.
HRADEC-
KYJOVICE FM.
(CULM)
MORAVICE
FM. (CULM)
MYSLEJOVICE
FM. (CULM - SOUTH)
KAMVINA FM. ABOVE
PROKOP COAL
OSTRAVA FM.
(MOLASSE)
ŘÍČKA LMST.
HOSTĚNICE BRECCIA
BŘEZINA SHALE
OLD
CULM
MACOCHA LMST.
DRAŽOVICE LMST.
(PLATFORM FACIES)
LIŠEŇ FM.
HADY LMST.
KRTINY LMST.
(CONDENSED SLOPE FACIES)
MACOCHA FM.
VIRTUKY LMST.
BASAL CLASTIC FM.
VILÉMOVICE LMST. (LIGHT GRAY MASSIVE FACIES)
LAŽÁNKY LMST. (DARK GRAY WITH AMPHIPORA)
CORALS & STROMATOPOROIDS !
PETROVICE
SHALE
BASIN - FROM CONTINETAL RIFT TO OCEAN SEAS
PONIKEVSILICA SHALES & BASALT GUYOTS
? HYPOTHETICAL S-D CONGLOMERATES
& RELICTS OF CAMBRIAN BELOW ?
MAIN VARISCAN OROGENY
FIRST DISTURBANCES
BREAK-UP AND EXTENSION

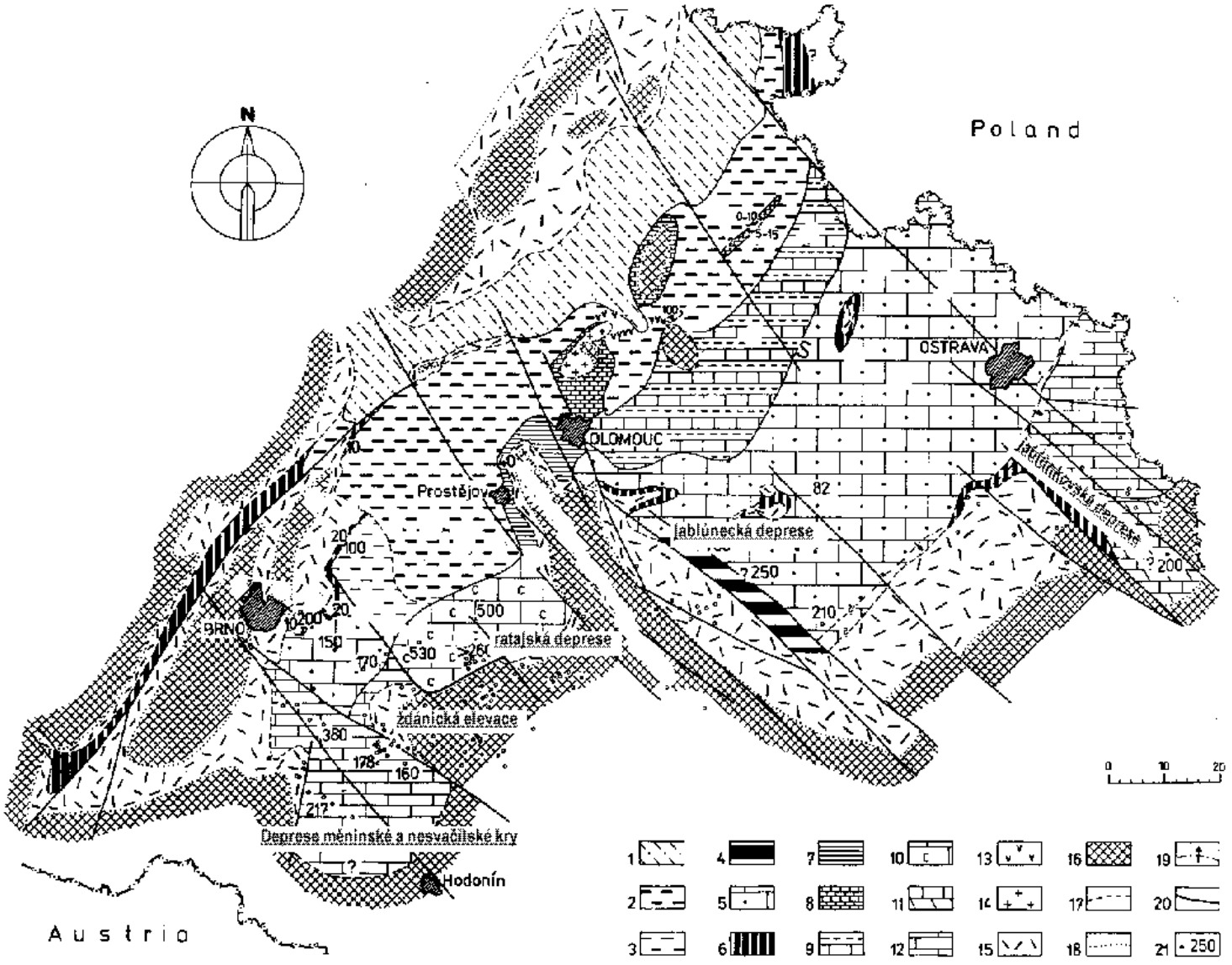
Bornhardtina



Amphipora ramosa

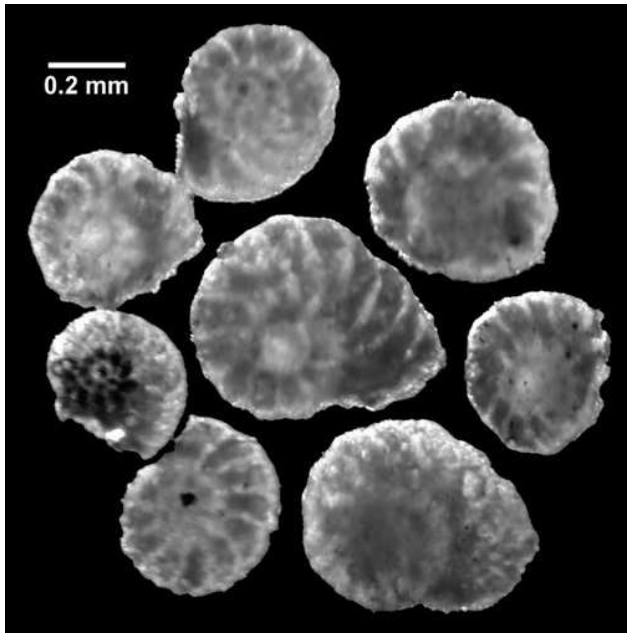
# Moravian Karst (platform) Development

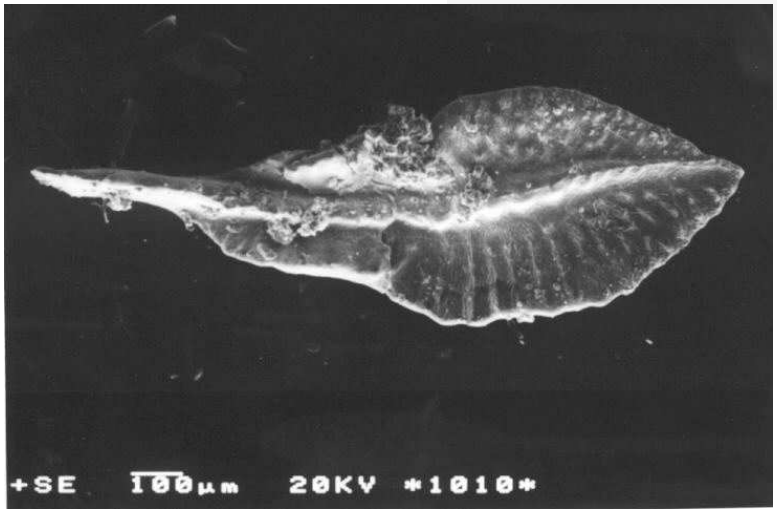
**Basal clastics** – red colour, conglomerates, sandstones
**Macocha Formation**
Josefov Formation – brachiopods (Bornhardtina, Stringocephalus).
Lažánky Limestones – dark grey, branched stromatoporoids (Amphipora, Stachyodes)
Vilémovice Limestones – abundant corals, stromatopotroids, calcareous algae.
4 cycles – Čelechovice, Býčí Skala, Ochoz and Mokrá starting with pioneering associations (darker limestones) to the flourishing of reef asociations (light limestones)
**Líšeň Formation**
Křtiny Limestones nodular, micritic, pelagic and benthic fauna (conodonts, radiolarians), hemilelagic limestones, mud calciturbidites, higher content of clay
Hády-Říčka Limestones – bioclastic(crinoids, foraminifers, calcareous algae), intercalations of shales. Calciturbidites, benthic and nectonic fauna. Hemipelagic parts – nectonic and planctonic fauna (conodonts, radiolarians)
Hněvotím limestones – thin bedded (laminated), calciturbidites.
Dražovice Limestones – boreholes eastern part of Moravia, below units of West Carpathians, shallow water platform limestones with crinoids, calcareous algae and foraminifers


N
Poland
OSTRAVA
OLOMOUC
Prostějov
BRNO
Hodonín
Austria
jablúnecká deprese
ratajská deprese
žďánická elevace
Deprese měnínské a nesvačilské kry
0-10
5-15
82
250
210
200
500
530
380
178
160
212
0 10 20

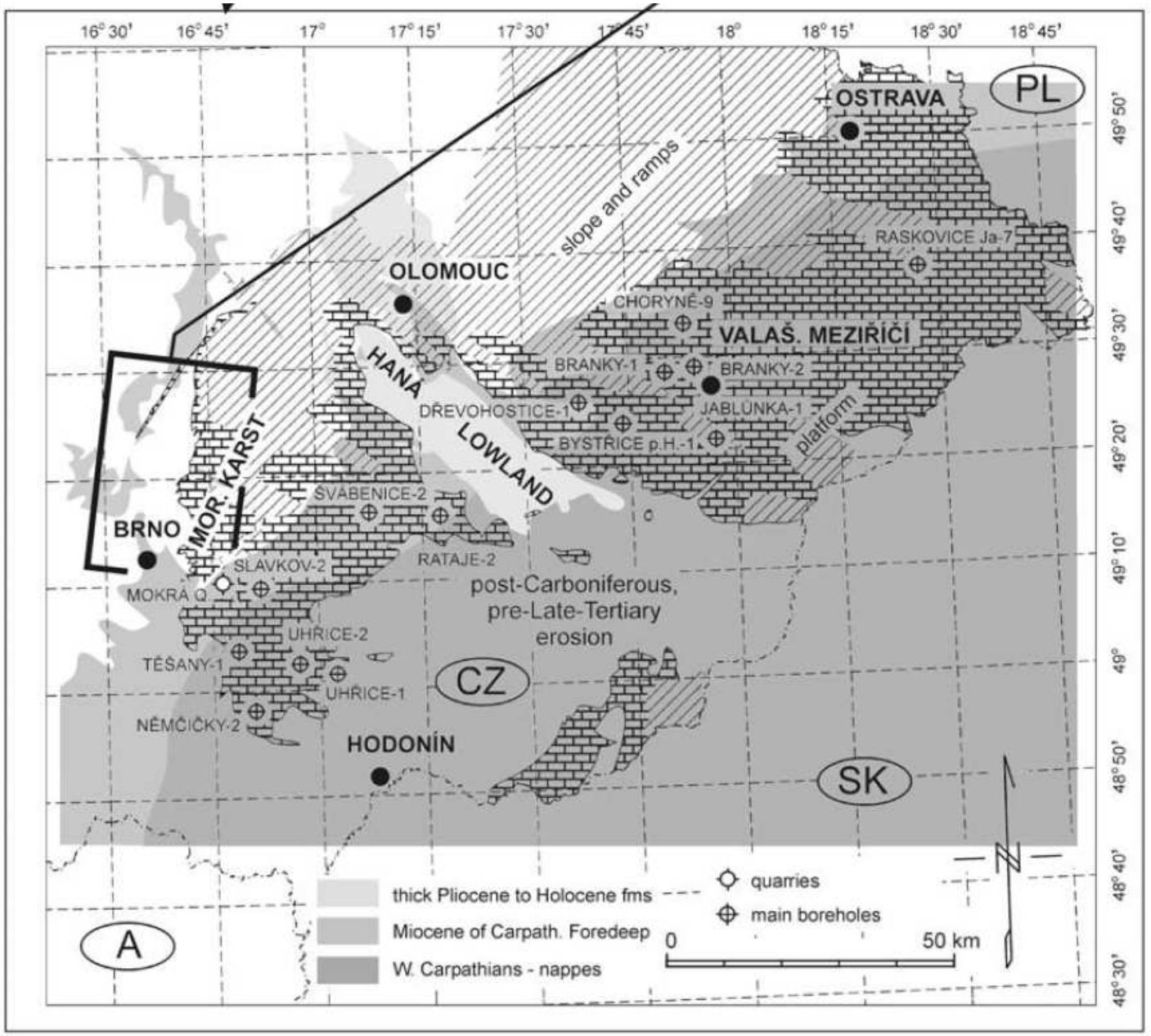
Palmatolepis

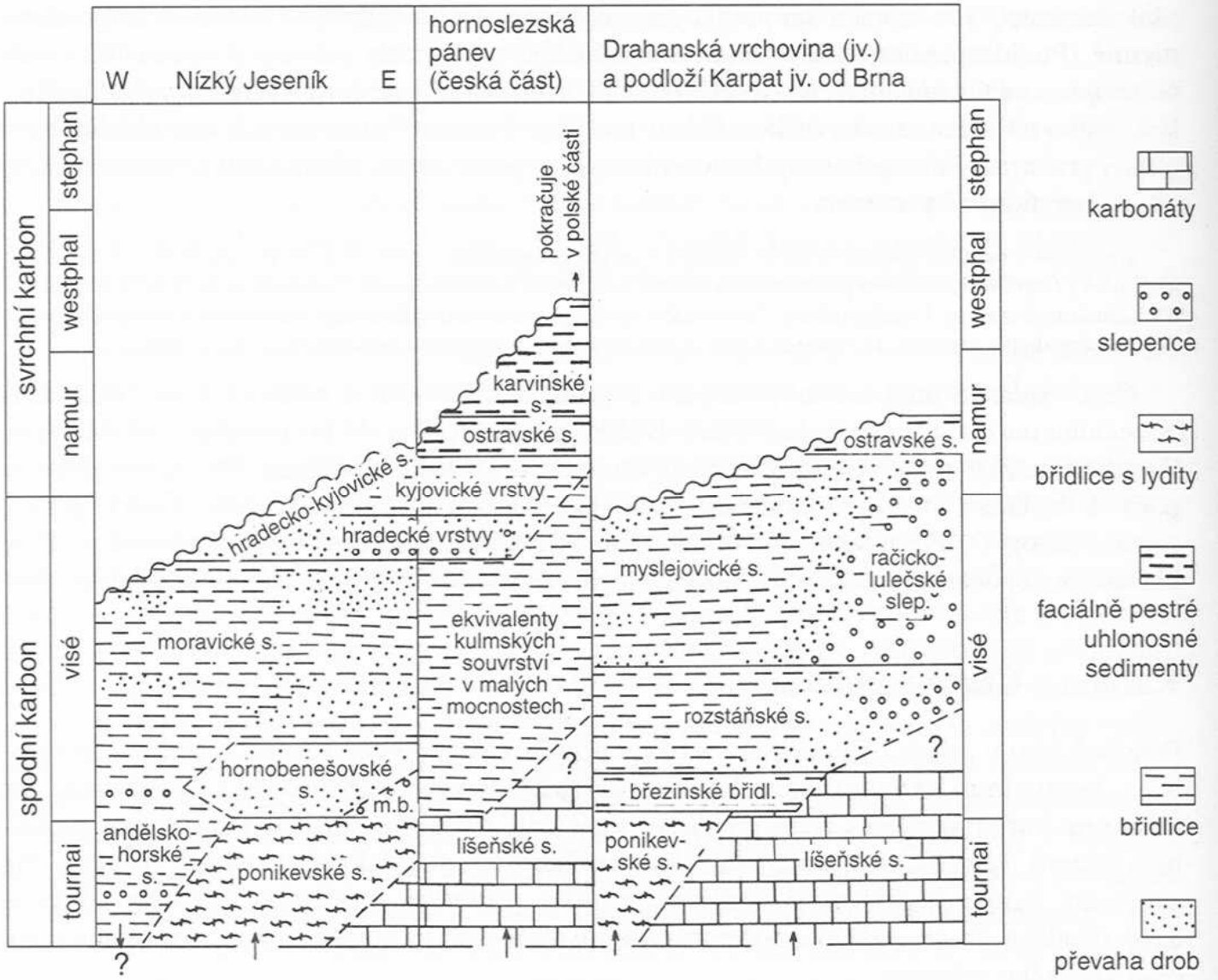
Nanicella



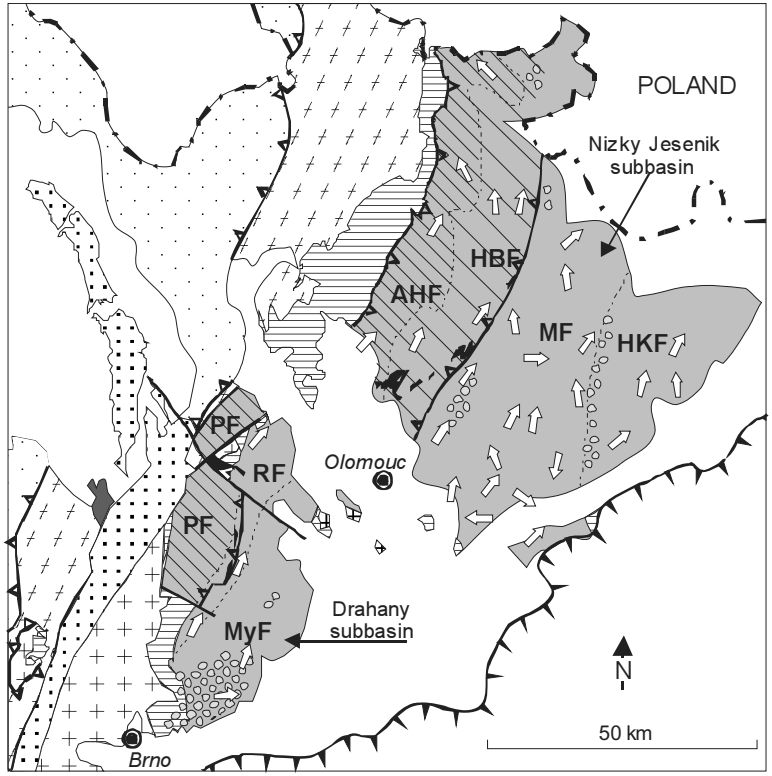




# Clymenia


16° 30'
16° 45'
17°
17° 15'
17° 30'
17° 45'
18°
18° 15'
18° 30'
18° 45'
49° 50'
49° 40'
49° 30'
49° 20'
49° 10'
49°
48° 50'
48° 40'
48° 30'
PL
OSTRAVA
RASKOVICE Ja-7
slope and ramps
OLOMOUC
CHORYNĚ-9
VALAŠ. MEZIŘÍČÍ
BRANKY-1
BRANKY-2
HANÁ
DŘEVOHOSTICE-1
JABLUNKA-1
LOWLAND
platform
BYSTŘICE p.H.-1
MOR. KARST
ŠVÁBENICE-2
BRNO
RATAJE-2
SLAVKOV-2
MOKRÁ Q.
post-Carboniferous,
pre-Late-Tertiary
erosion
UHŘICE-2
TĚŠANY-1
CZ
UHŘICE-1
NĚMČIČKY-2
HODONÍN
SK
A
thick Pliocene to Holocene fms
Miocene of Carpath. Foredeep
W. Carpathians - nappes
quarries
main boreholes
0
50 km




Obr. 109. Stratigrafické schéma karbonu moravskoslezské oblasti (sestaveno s použitím výzkumů O. Kumpery a J. Dvořáka). s. – souvrství, m.b. – moravskoberounské slepence, slep. – slepence, břidl. – břidlice.




KEY:

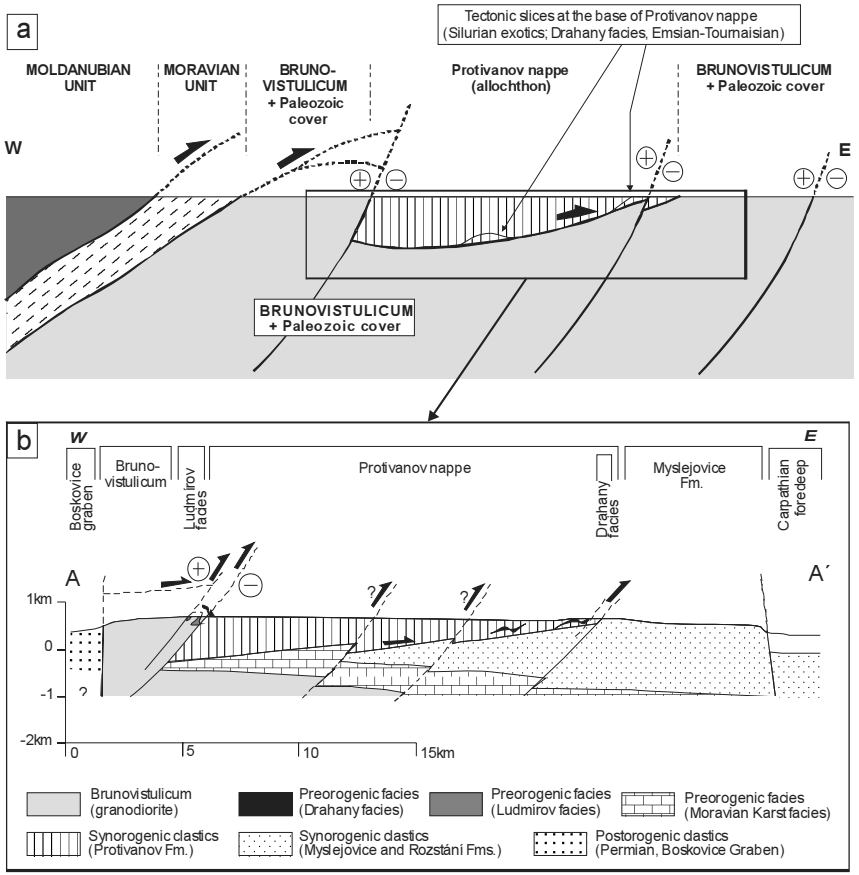
- Platform cover (Jurassic - Quaternary)
- Postorogenic clastics (Permian)
- Parautochthonous preorogenic units (Moravian Karst, Ludmírov and Vrbno facies)
- Allochthonous preorogenic units (Drahany facies)
- Moravo-Silesian Unit (Proterozoic - lower Paleozoic)
- Brunovistulicum (upper Proterozoic)
- Lugodanubian group of terranes (Proterozoic - ?Carboniferous)
- Alpine front (Outer Western Carpathians)
- Post-Variscan fault
- Variscan thrust fault

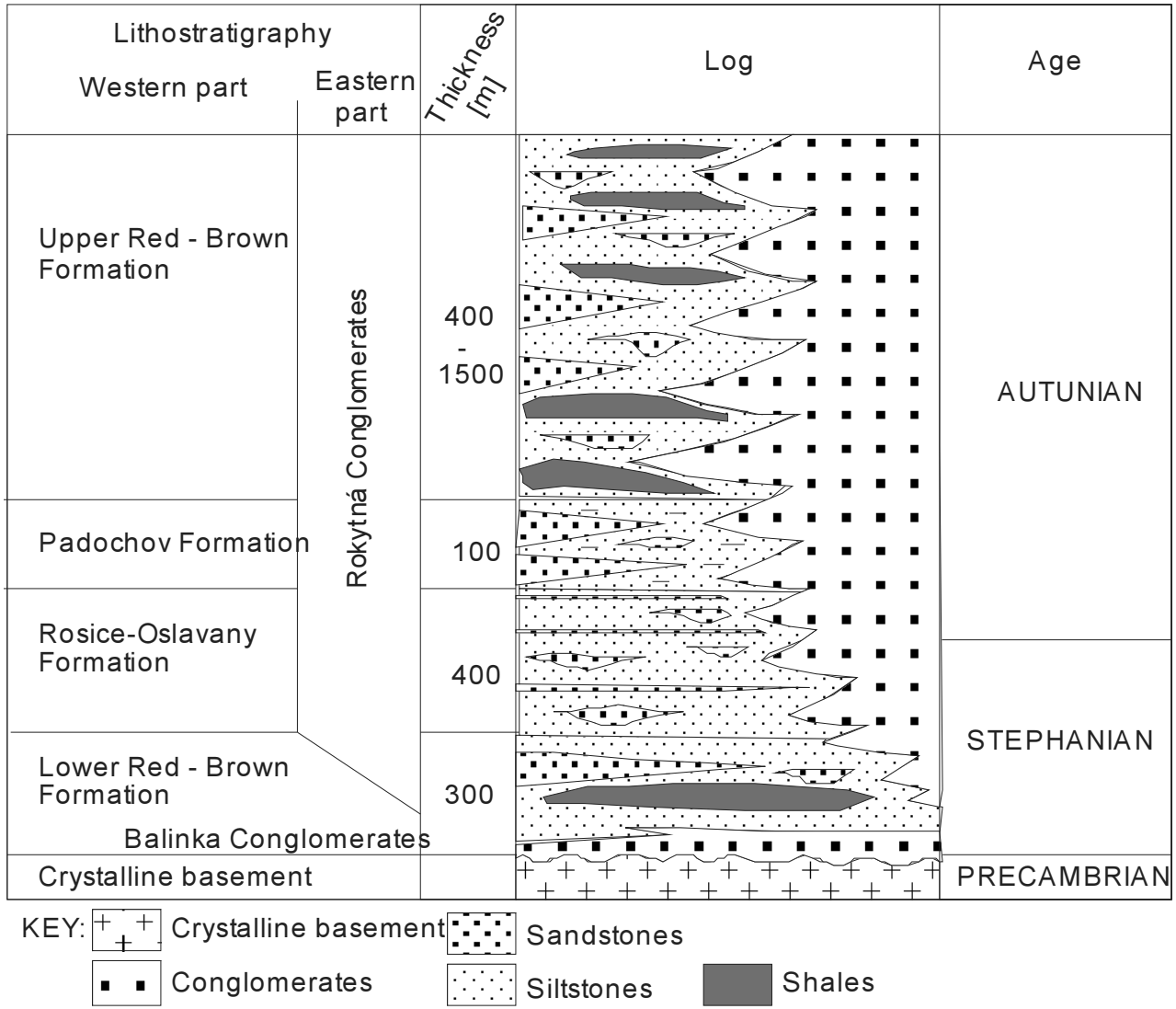
SYNOROGENIC CLASTICS

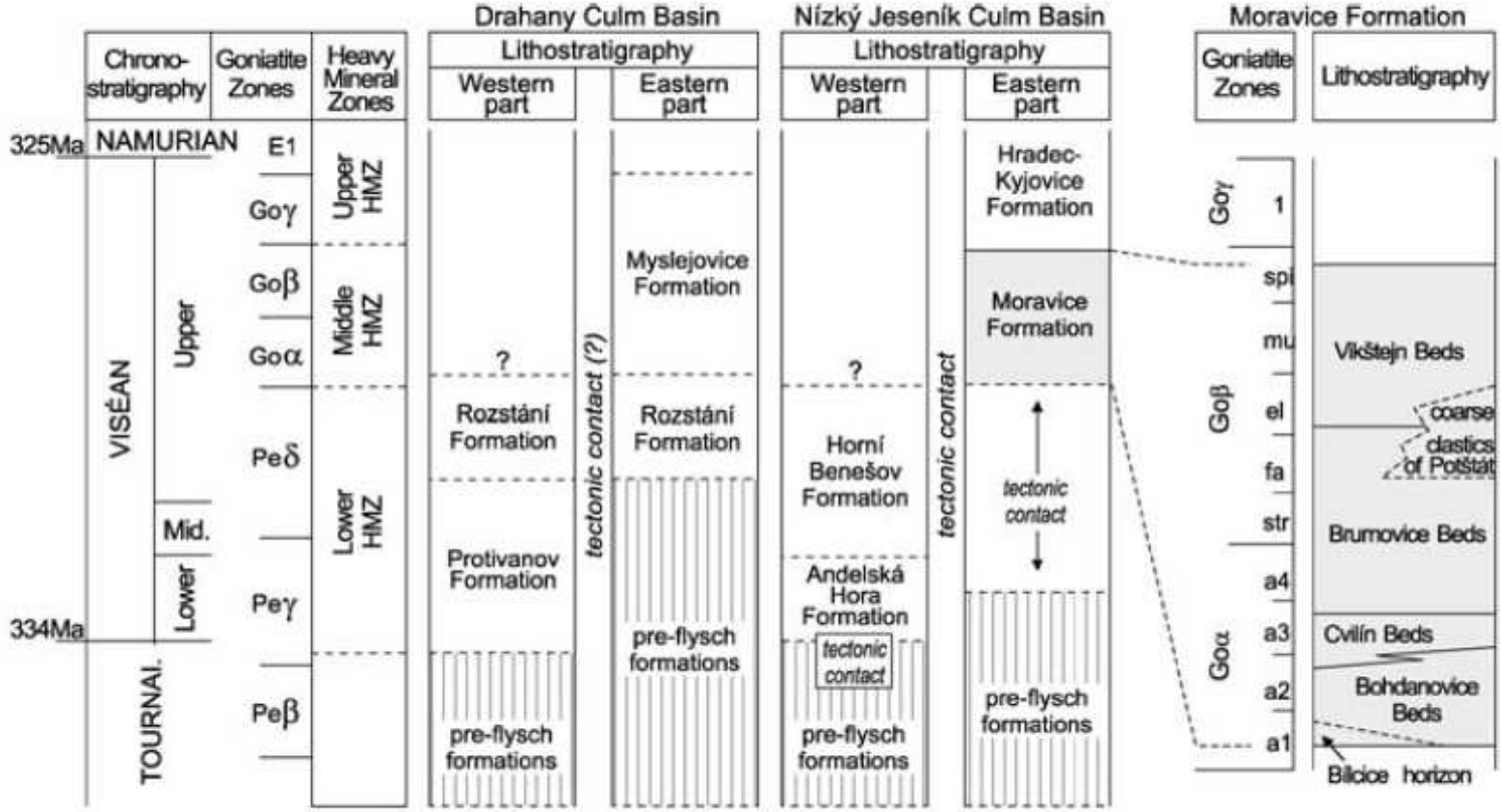
- Parautochthonous synorogenic clastics
- Allochthonous synorogenic clastics
- Conglomerate facies within synorogenic clastics
- lithologic boundary between flysch formations

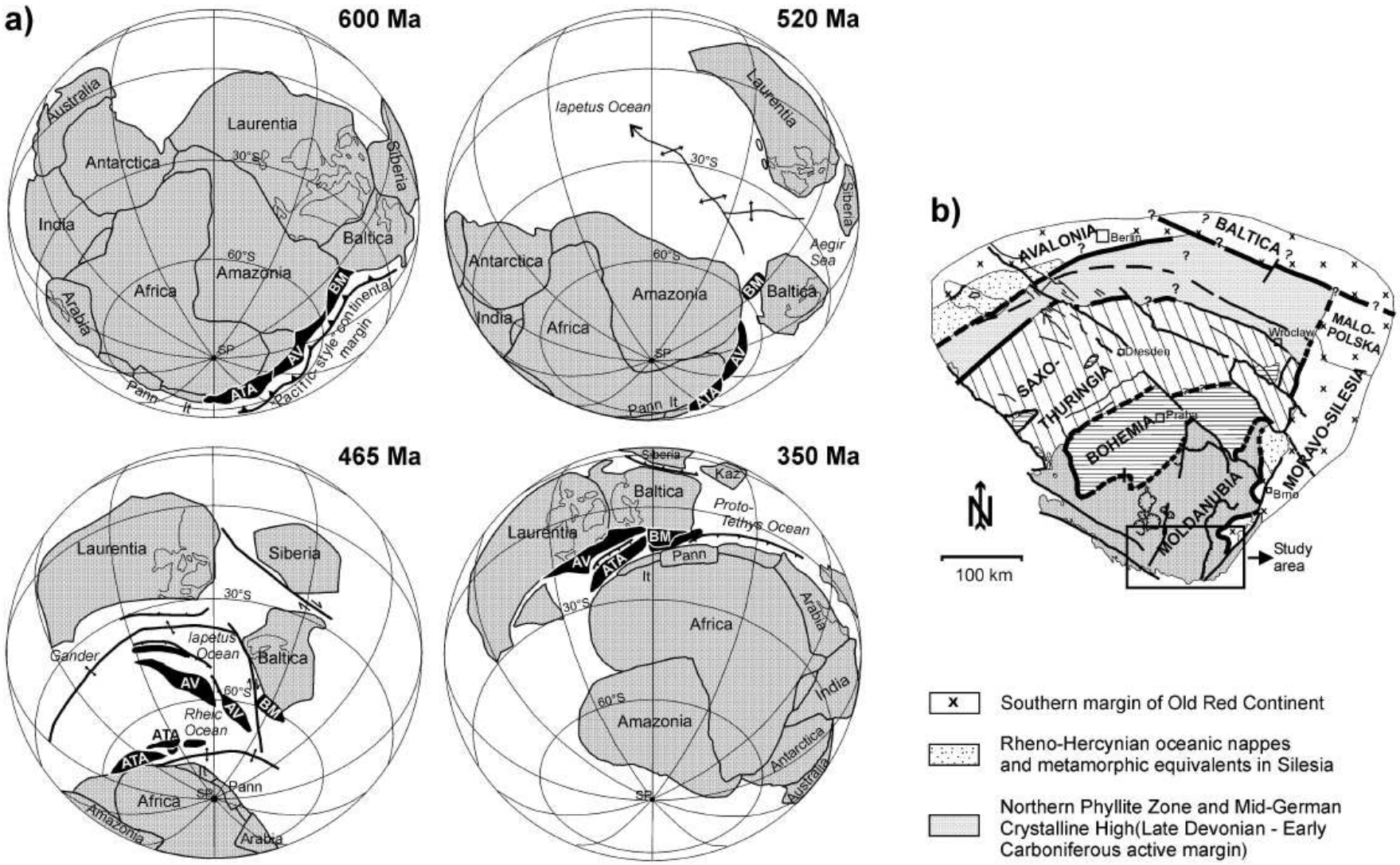
**PF** Protivanov Formation
**RF** Rozstání Formation
**MyF** Myslejovice Formation
**AHF** Andelska Hora Formation
**HBF** Horni Benesov Formation
**MF** Moravice Formation
**HKF** Hradec-Kyjovice Formation

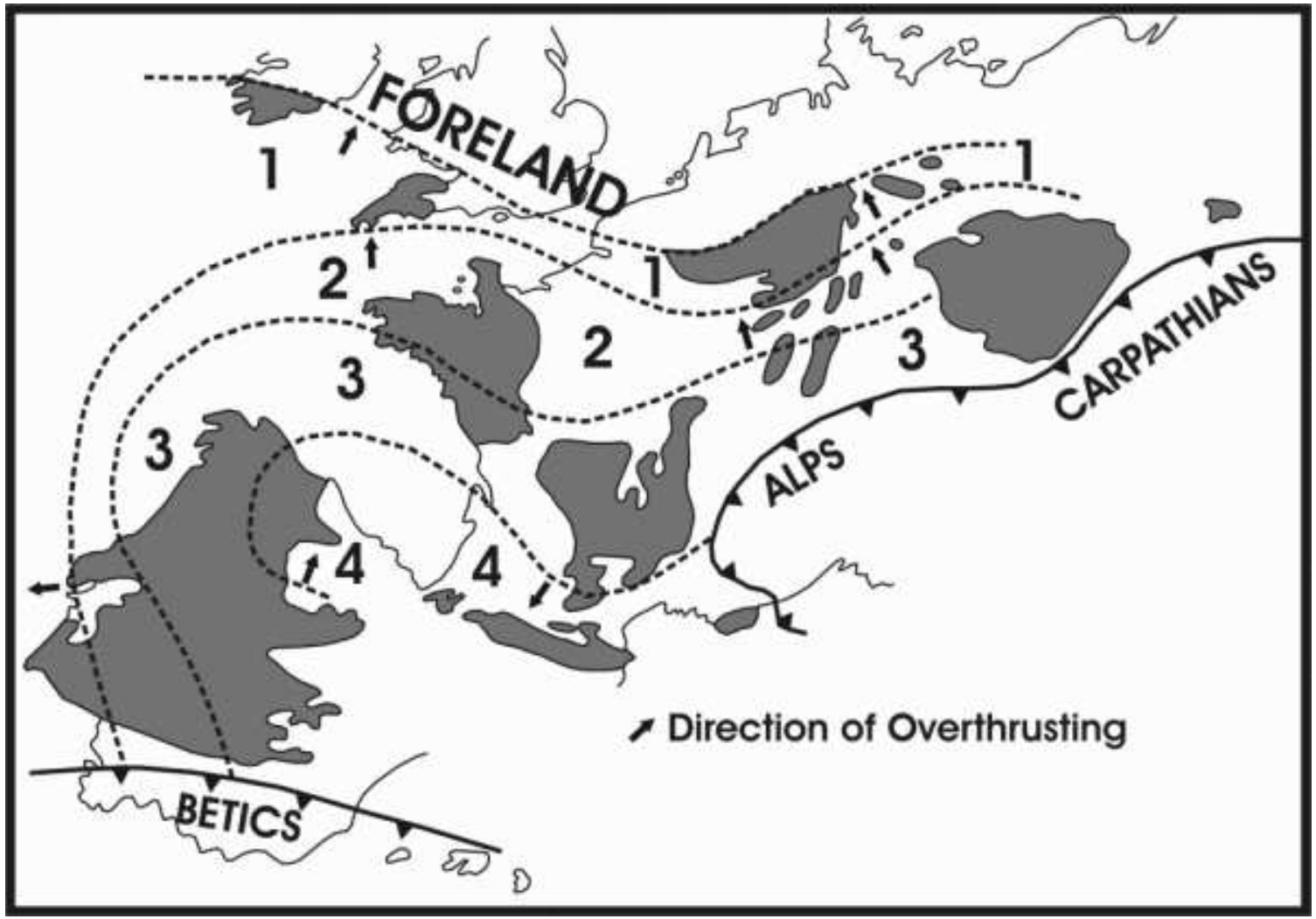
- paleocurrent directions


a
Tectonic slices at the base of Protivanov nappe
(Silurian exotics; Drahany facies, Emsian-Tournaisian)
MOLDANUBIAN UNIT
MORAVIAN UNIT
BRUNO-VISTULICUM + Paleozoic cover
Protivanov nappe (allochthon)
BRUNOVISTULICUM + Paleozoic cover
W
E
BRUNOVISTULICUM + Paleozoic cover
b
W
E
Boskovice graben
Bruno-vistulicum
Ludmirov facies
Protivanov nappe
Drahany facies
Myslejovice Fm.
Carpathian foredeep
A
A´
1km
0
-1
-2km
0
5
10
15km
Brunovistulicum (granodiorite)
Preorogenic facies (Drahany facies)
Preorogenic facies (Ludmirov facies)
Preorogenic facies (Moravian Karst facies)
Synorogenic clastics (Protivanov Fm.)
Synorogenic clastics (Myslejovice and Rozstání Fms.)
Postorogenic clastics (Permian, Boskovice Graben)


Lithostratigraphy
Western part
Eastern part
Thickness [m]
Log
Age
Upper Red - Brown Formation
Rokytná Conglomerates
400 - 1500
AUTUNIAN
Padochov Formation
100
Rosice-Oslavany Formation
400
STEPHANIAN
Lower Red - Brown Formation
300
Balinka Conglomerates
Crystalline basement
PRECAMBRIAN
KEY:
Crystalline basement
Sandstones
Conglomerates
Siltstones
Shales


Drahany Culm Basin
Nízký Jeseník Culm Basin
Moravice Formation
Chrono-stratigraphy
Goniatite Zones
Heavy Mineral Zones
Lithostratigraphy
Western part
Eastern part
325Ma
NAMURIAN
VISÉAN
TOURNAI.
334Ma
Upper
Mid.
Lower
E1
Goγ
Goβ
Goα
Peδ
Peγ
Peβ
Upper HMZ
Middle HMZ
Lower HMZ
?
Rozstání Formation
Protivanov Formation
pre-flysch formations
tectonic contact (?)
Myslejovice Formation
Horní Benešov Formation
Andelská Hora Formation
tectonic contact
Hradec-Kyjovice Formation
Moravice Formation
1
spi
mu
el
fa
str
a4
a3
a2
a1
Vikštejn Beds
coarse clastics of Potštát
Brumovice Beds
Cvilín Beds
Bohdanovice Beds
Bílcice horizon


a)
600 Ma
Australia
Laurentia
Antarctica
30°S
Siberia
India
Baltica
60°S
Amazonia
Africa
BM
Arabia
SP
AV
ATA
Pacific style continental margin
Pann
It
520 Ma
Iapetus Ocean
Laurentia
30°S
Siberia
Aegir Sea
Antarctica
60°S
Amazonia
BM
Baltica
India
Africa
SP
AV
Pann
It
ATA
465 Ma
Laurentia
Siberia
30°S
Iapetus Ocean
Gander
Baltica
AV
60°S
AV
BM
Rheic Ocean
ATA
ATA
It
Pann
SP
Africa
Amazonia
Arabia
350 Ma
Siberia
Kaz
Baltica
Proto-Tethys Ocean
Laurentia
BM
AV
ATA
Pann
It
30°S
Africa
Arabia
India
60°S
Amazonia
Antarctica
SP
Australia
b)
AVALONIA
Berlin
BALTICA
MALO-POLSKA
Wroclaw
Dresden
SAXO-THURINGIA
BOHEMIA
Prahe
MORAVO-SILESIA
Brno
MOLDANUBIA
Study area
100 km
Southern margin of Old Red Continent
Rheno-Hercynian oceanic nappes and metamorphic equivalents in Silesia
Northern Phyllite Zone and Mid-German Crystalline High(Late Devonian - Early Carboniferous active margin)


FORELAND
1
2
3
4
CARPATHIANS
ALPS
BETICS
Direction of Overthrusting

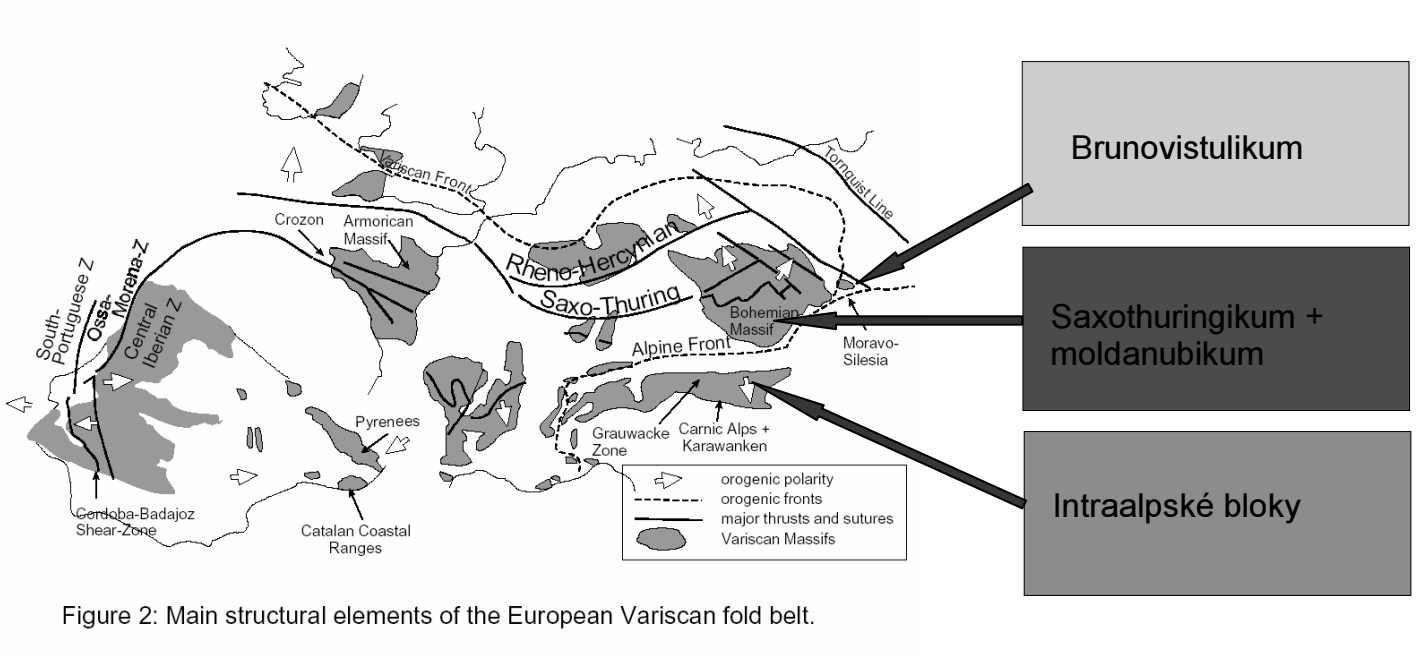



Figure 2: Main structural elements of the European Variscan fold belt.