Stratigrafija in paleontološke naravne vrednote zgornjekarbonskih plasti litijskega rudnega polja

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SLOVENIJA

Geološka zgradba Slovenije

KVARTAR
- aluvialni nanosi rek in potokov (prod, pesek, glina), gruš., morene in konglomerat
- glina in pesek
- prod, pesek in glina

PLIOCEN, PLEISTOCEN
- pesek, peščenjak, konglomerat, lapor, glina in apnenec

MIOCEN
- lapor, glina, peščenjak, konglomerat in apnenec

OLIGOCEN
- andezitni tuf
- andezit in dacit
- tonalit

EOCEN
- menjavanje laporja, glinovca in peščenjaka (fliš); peščenjak in glinovec
- skladovit apnenec; alveolinsko-numulitni apnenec
- menjavanje laporja, glinovca, peščenjaka in breče (fliš)
- apnenčeva breča, fliš in rdeči lapor

PALEOCEN
- rudistni in drobnozrnati apnenec

KREDA
- ploščasti volčanski apnenec z rožencem; menjavanje ploščastega apnenca in rdečega laporja
- bituminozni dolomit in drobnozrnati apnenec
- menjavanje glinovca, laporja in peščenjaka, gomolji roženca (fliš)
- grebenski apnenec s koralami in hidrozoji, oolitni apnenec, menjavanje apnenca in dolomita

JURA
- oolitni in drobnozrnati apnenec, bituminozni dolomit
- ploščasti apnenec, glinovec in roženec
- skladoviti apnenec in dolomit

TRIAS
- ploščasti baški dolomit in apnenec z rožencem
- glinovec, peščenjak, breča, apnenec in dolomit
- dolomit in apnenec
- glinovec, peščenjak, tuf, lapor, konglomerat in ploščasti apnenec
- keratofir, porfirit, kremenov keratofir, porfir in diabaz
- dolomit, apnenec, lapor in peščenjak

PERM
- kremenov peščenjak in konglomerat, glinovec ter apnenec

KARBON, PERM
- granit in granodiorit

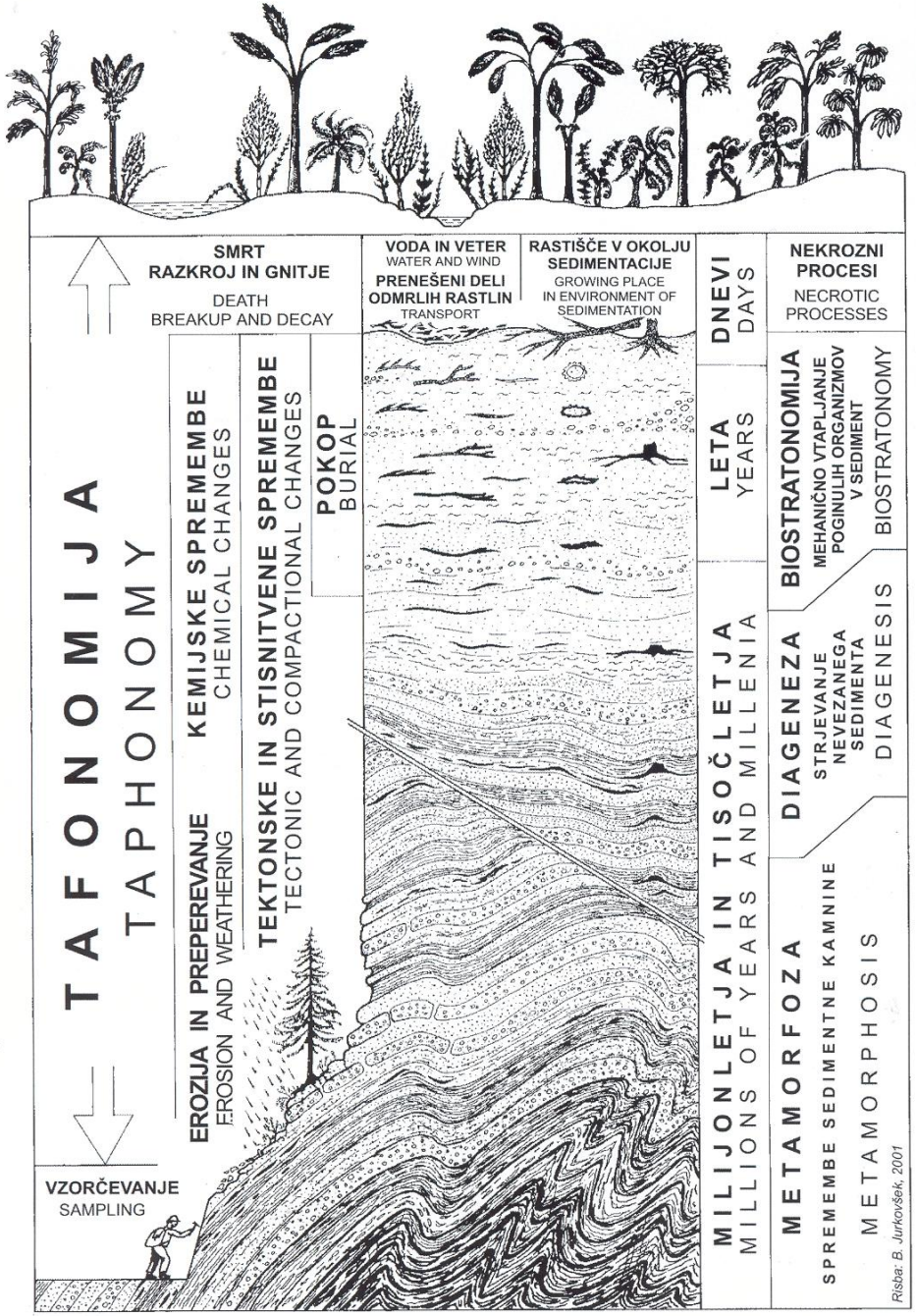
DEVON
- skrilavi glinovec, kremenov peščenjak in konglomerat ter apnenec
- apnenec

PREKAMBRIJ, DEVON
- kremenov sericitni filit in filitoidni skrilavci z diabazom
- gnajs, bleštnik, amfibolit, ekilogit, serpentinit, kloritno-amfibolov skrilavec in marmor

- geološka meja
- prelom
- nariv
- luska

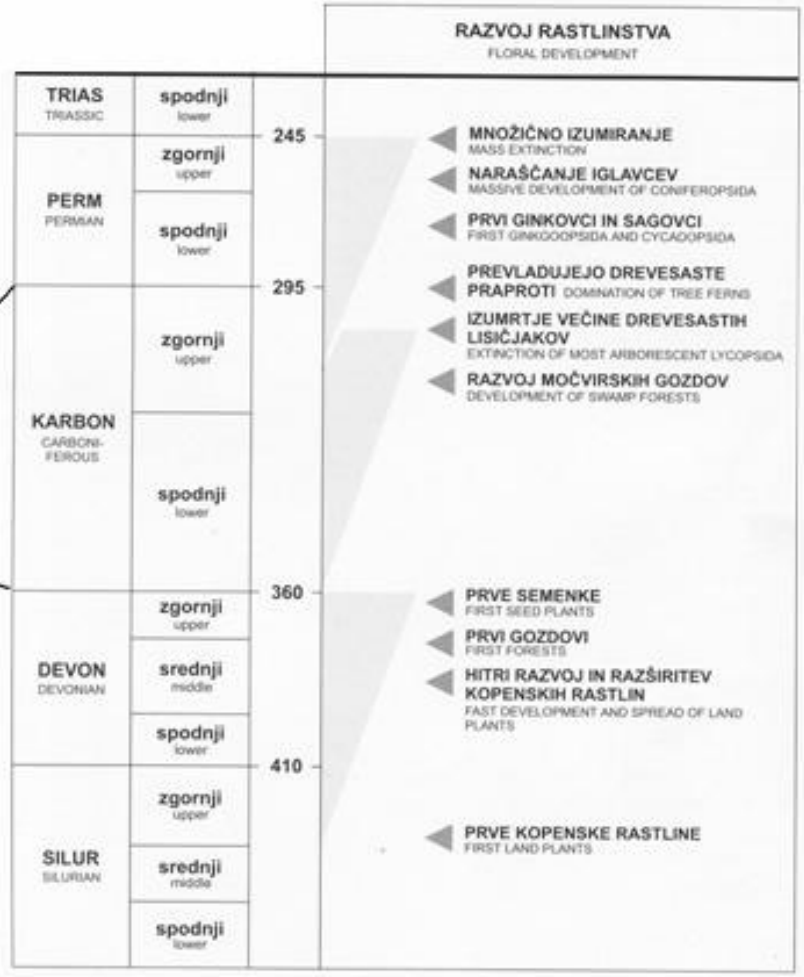
Eno najbogatejših nahajališč karbonskih rastlinskih fosilov Posavskih gub je bilo odkrito leta 1985 v Zavrstniku pri Litiji. Plast s fosili je označena z geološkim kladivom.

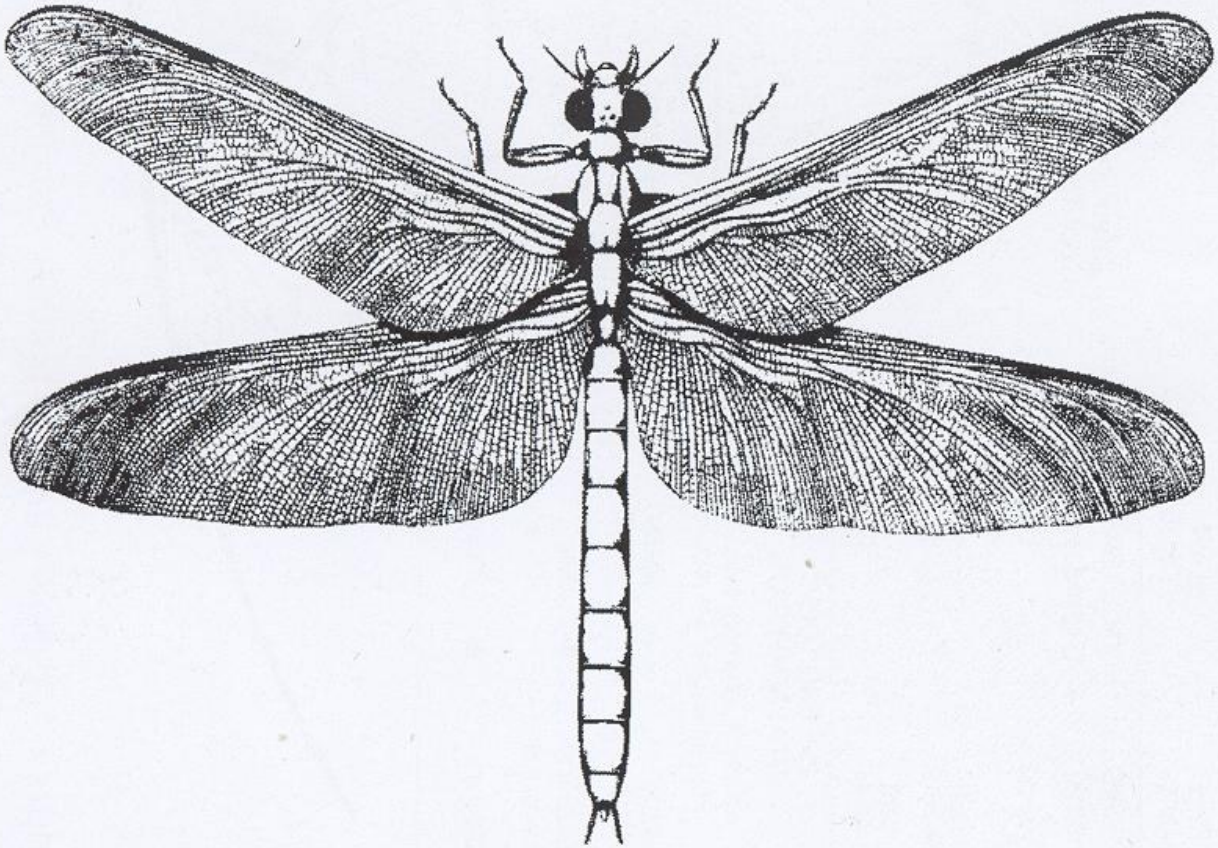
One of the richest localities of Carboniferous plant fossils in the Sava folds was discovered in 1985 at Zavrstnik near Litija. The fossiliferous bed is marked with the geologic hammer.



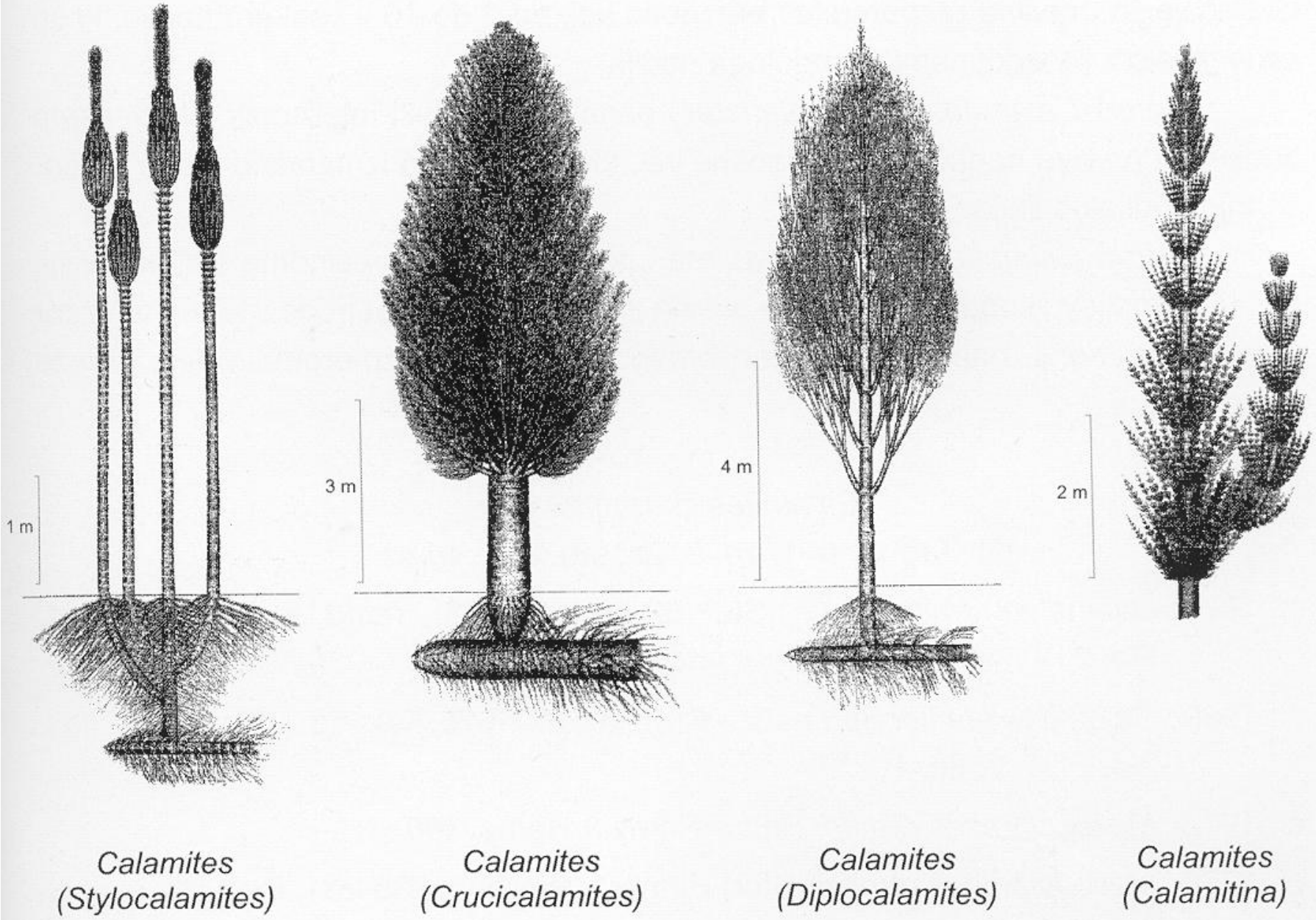
Poenostavljen prikaz tafonomije rastlin in spremljajočih procesov.
Simplified presentation of plant taphonomy and accompanying processes.

Vek	Perioda	Starost v mil. let	Pregled razvoja rastlin in živali
NOVI ZEMELJSKI VEK KENOZOIK	NEOGEN	0,01	
		1,8	
	PALEOGEN	5	
		23	
		34	
		56	
		65	
SREDNJI ZEMELJSKI VEK MEZOZOIK	KREDA	146	
	JURA	200	
	TRIAS	251	
STARI ZEMELJSKI VEK PALEOZOIK	PERM	299	
	KARBON	359	
	DEVON	416	
	SILUR	444	
	ORDOVICIJ	488	
	KAMBRIJ	542	
PREDKAMBRIJ		Čez 4000	

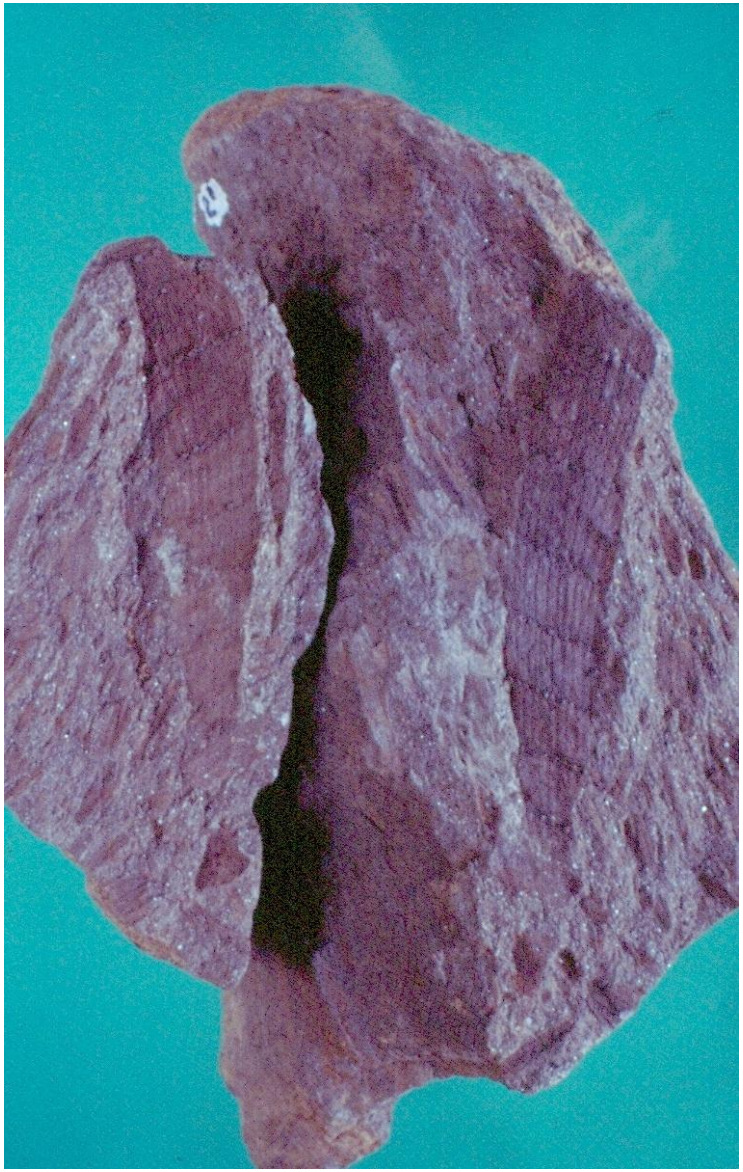


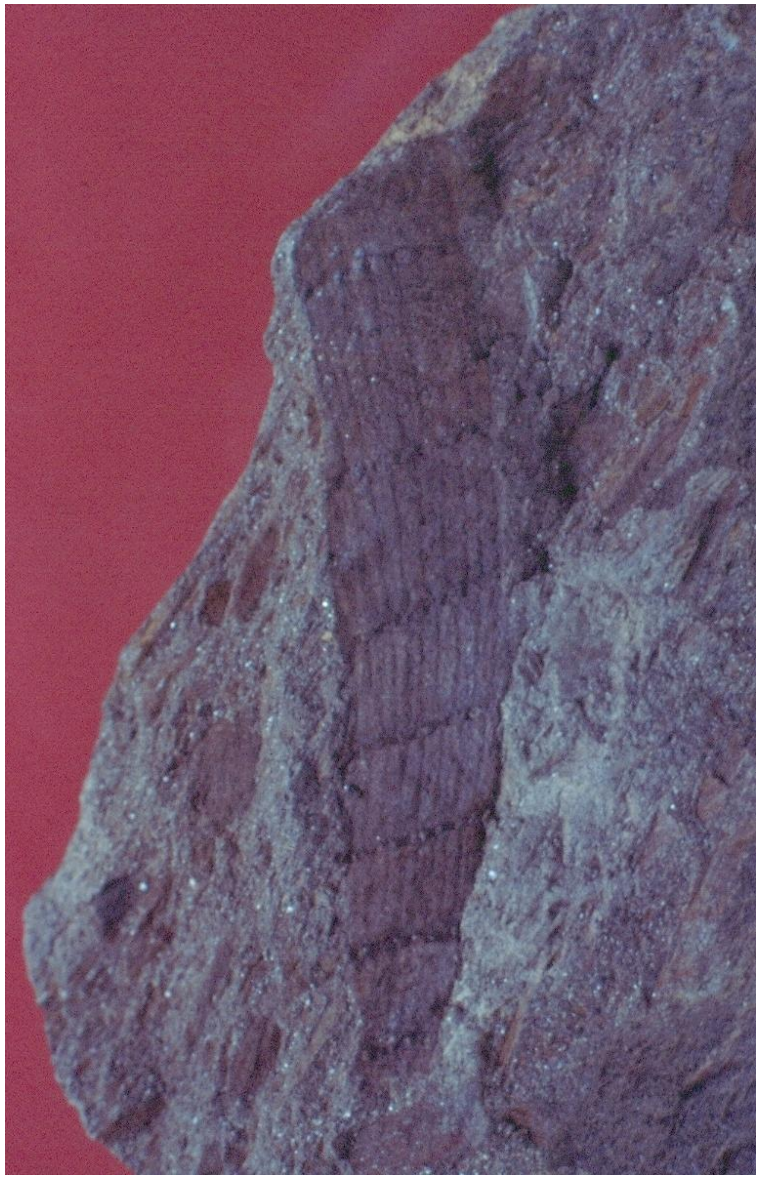


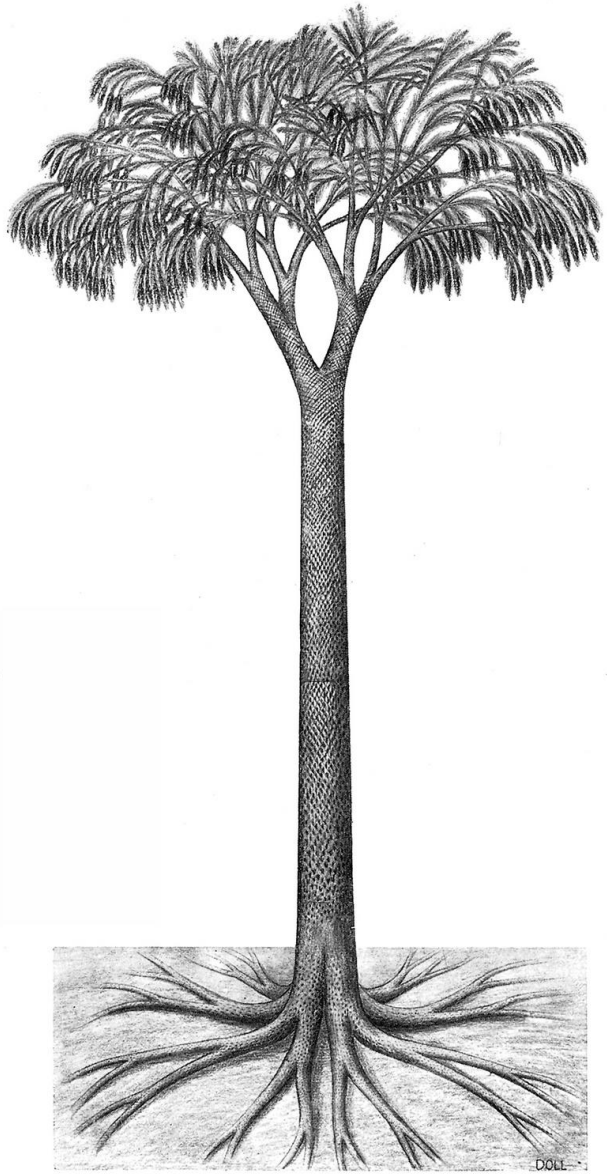
Meganeura monyi – orjaški zgornjekarbonski kačji pastir z razponom kril do 70 cm. Zittel 1915
Meganeura monyi – giant Upper Carboniferous dragonfly; wingspan up to 70 cm. Zittel 1915

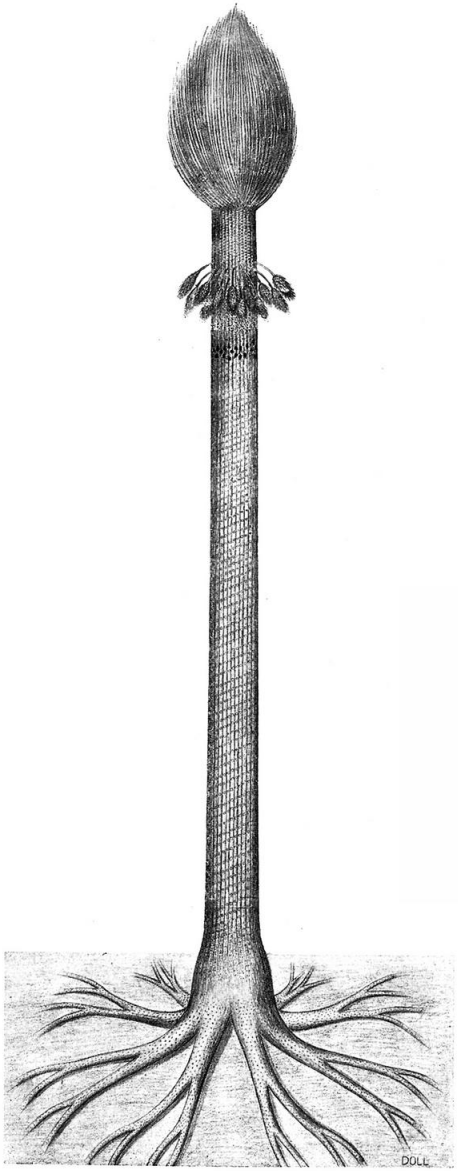


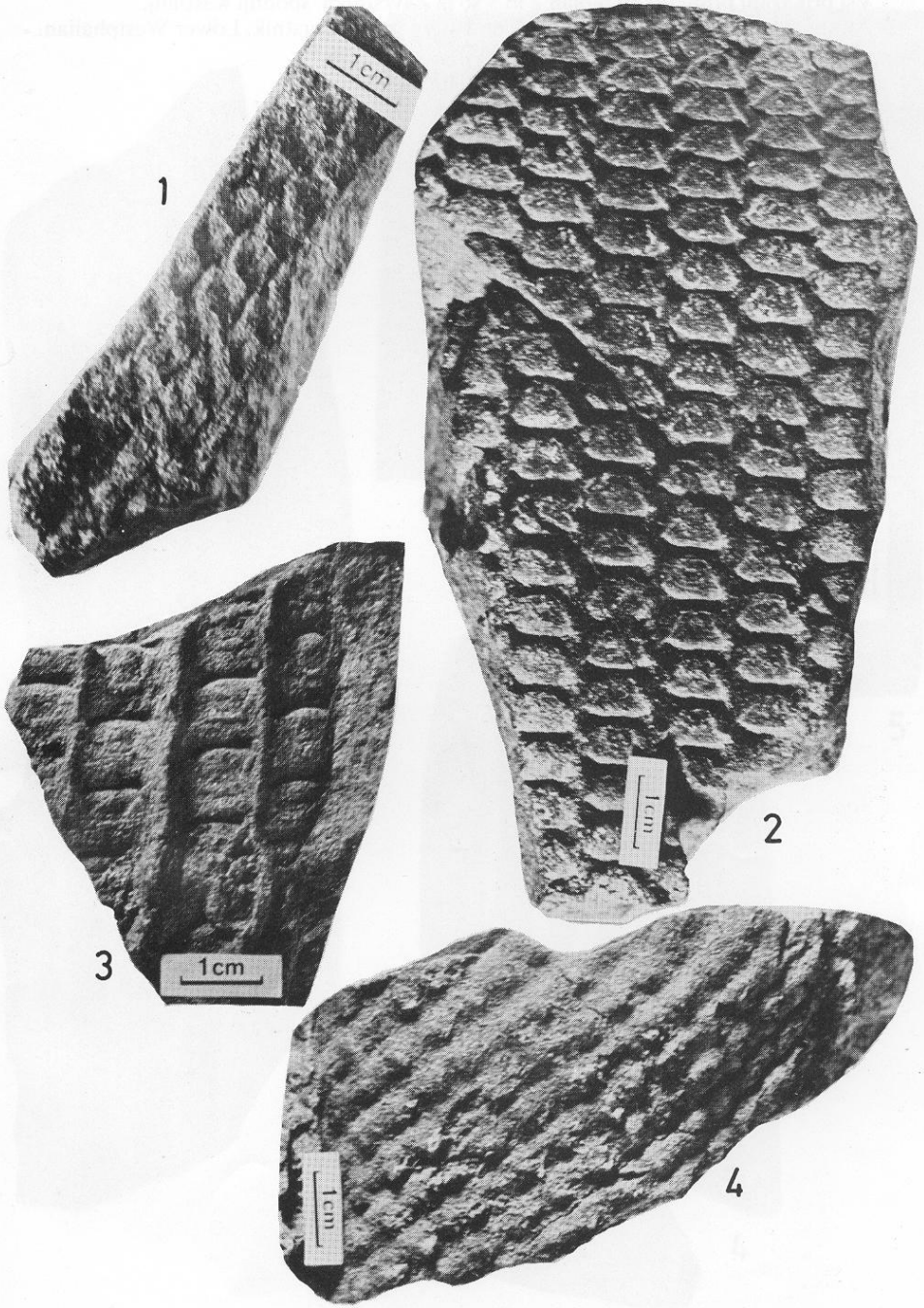
Rekonstrukcije podrodov rodu *Calamites*. Hirmer 1927





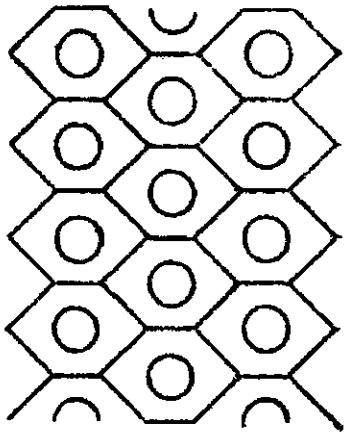

DOLL


DOLL

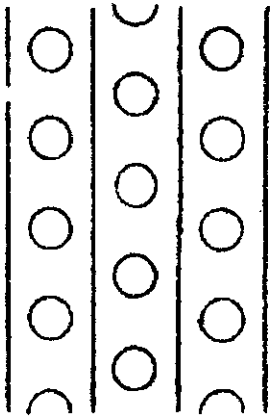

1
1cm
2
1cm
3
1cm
4
1cm

Eusigillaria

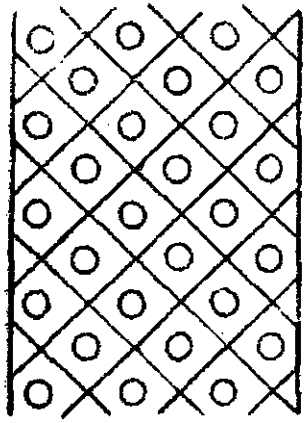
Subsigillaria



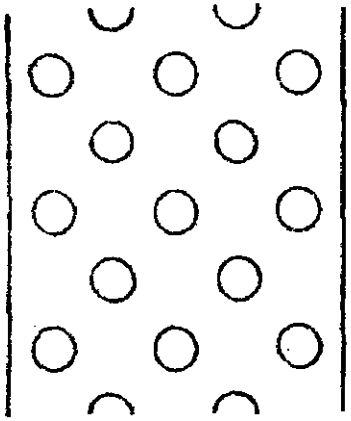
Favularia



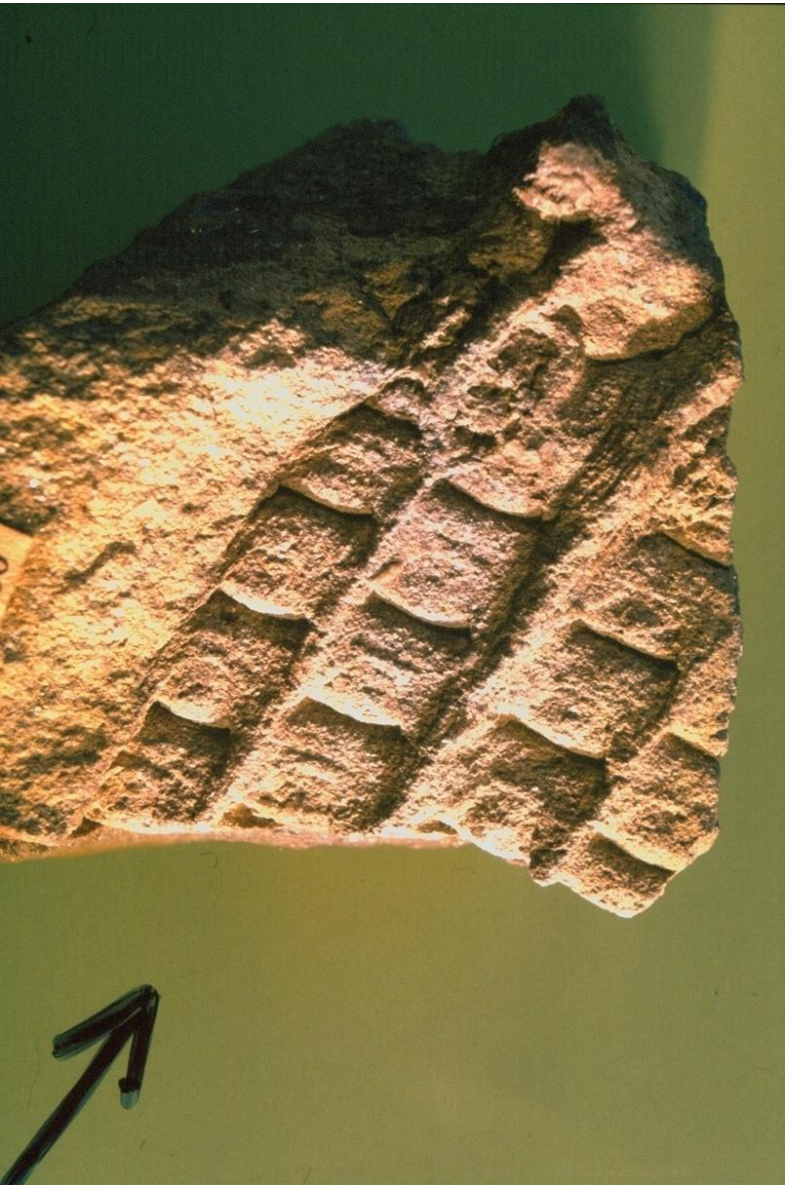
Rhytidolepis

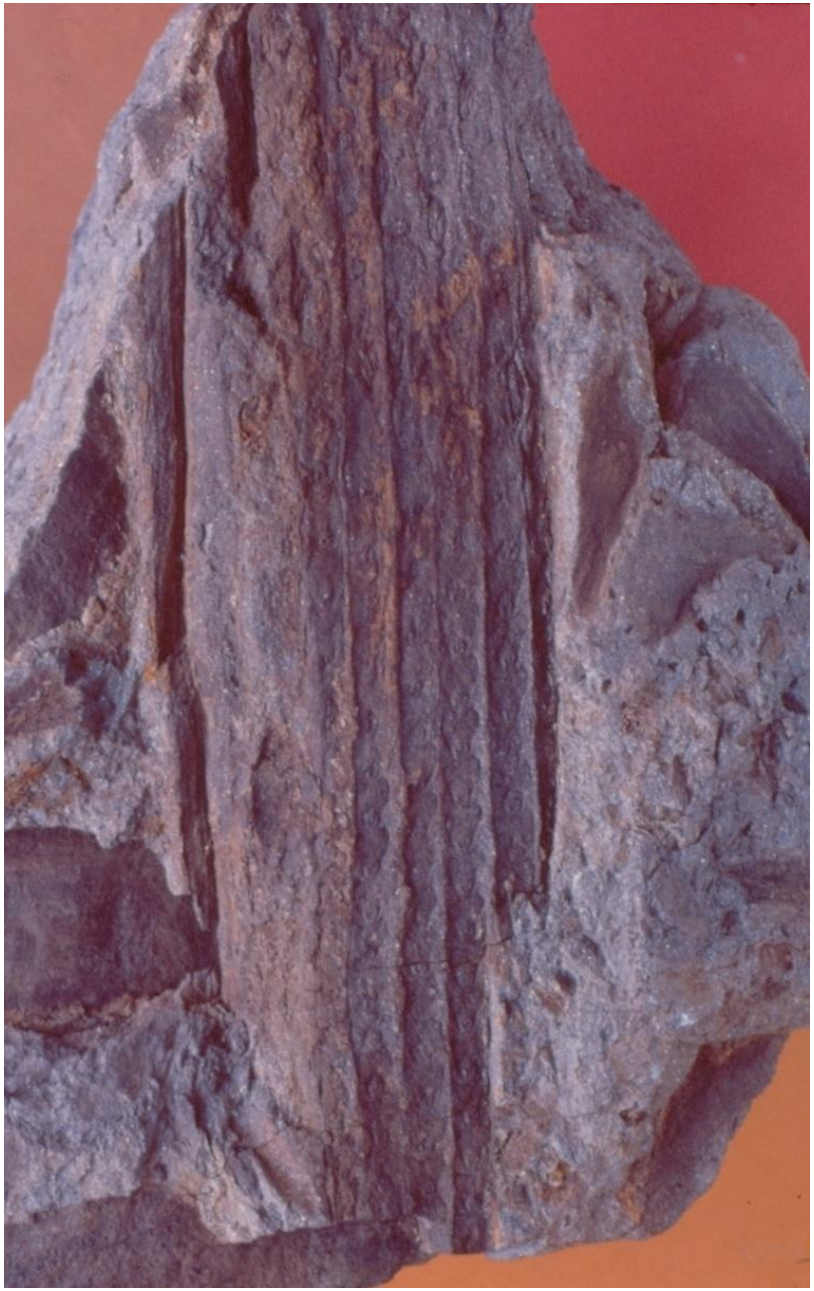


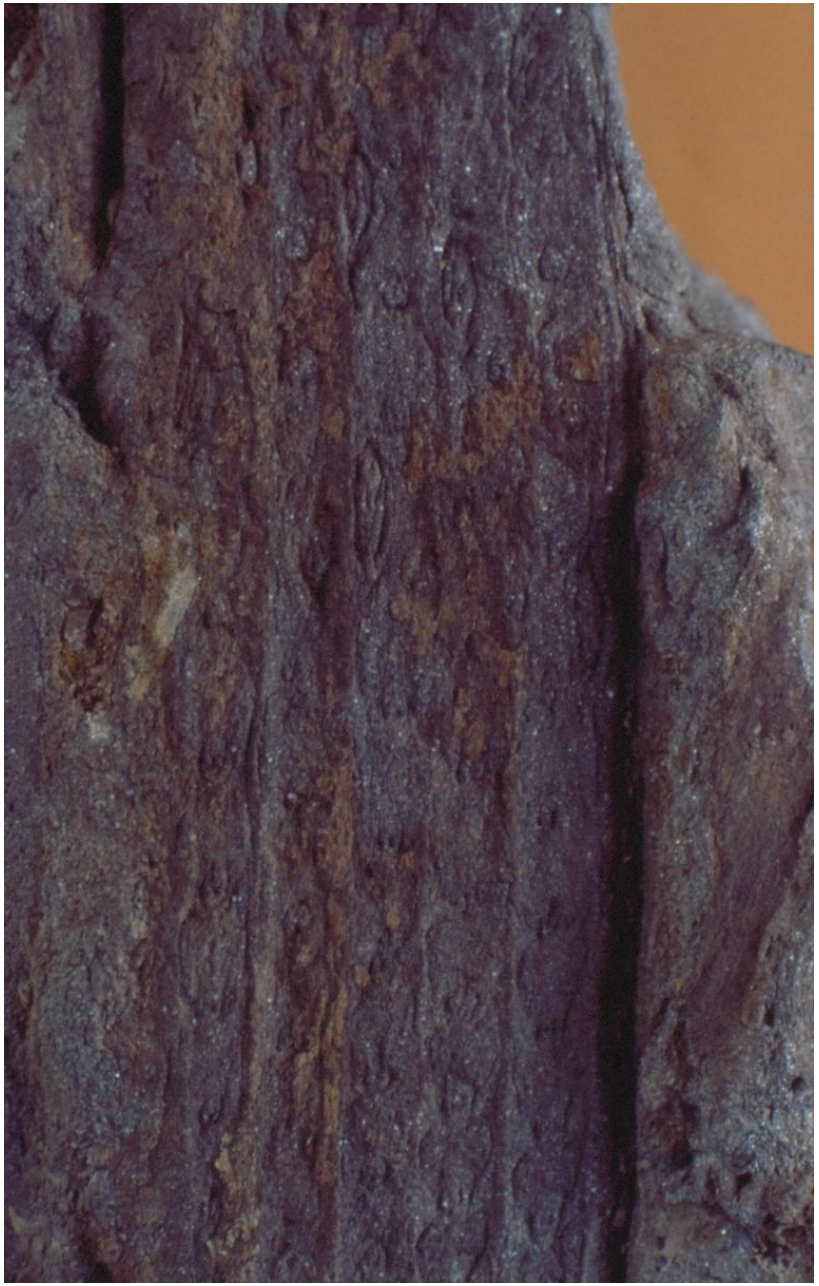
Clathraria

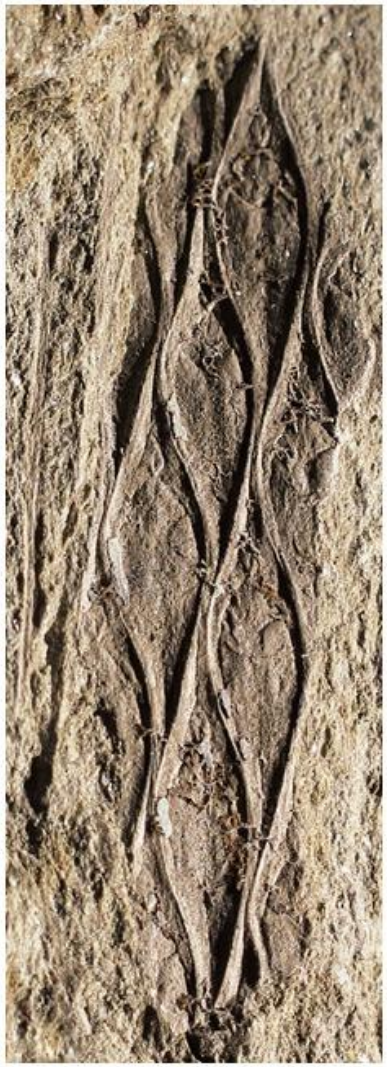


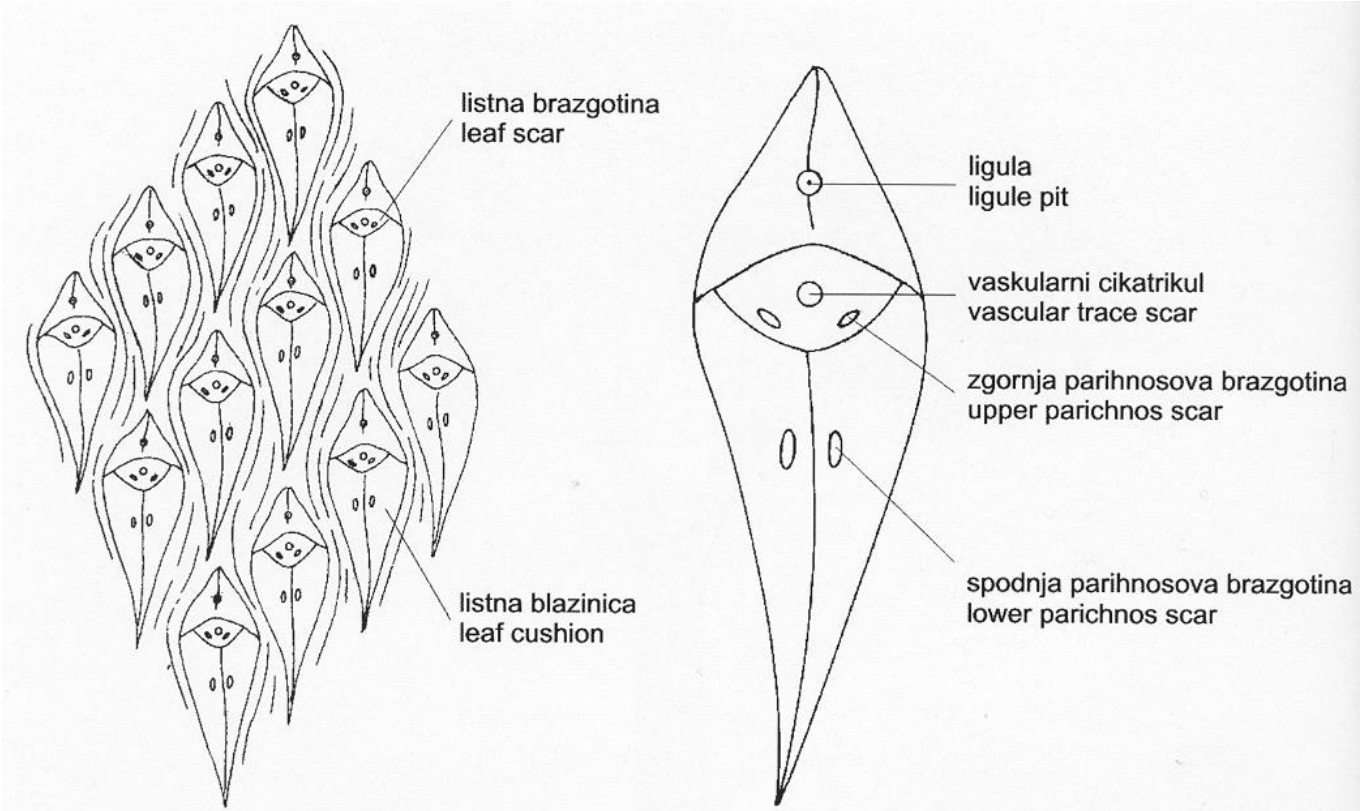
Leiodermaria



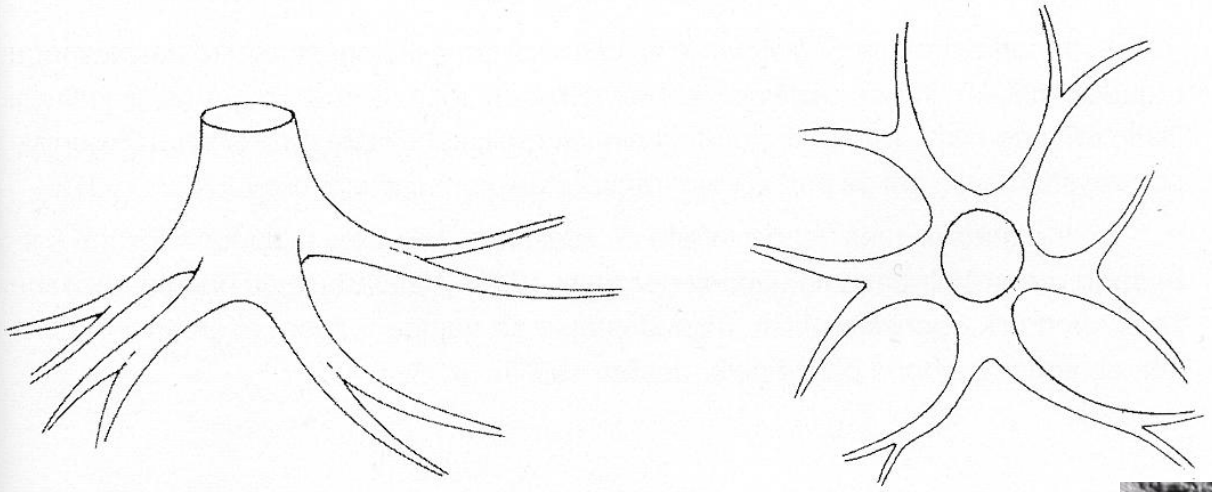






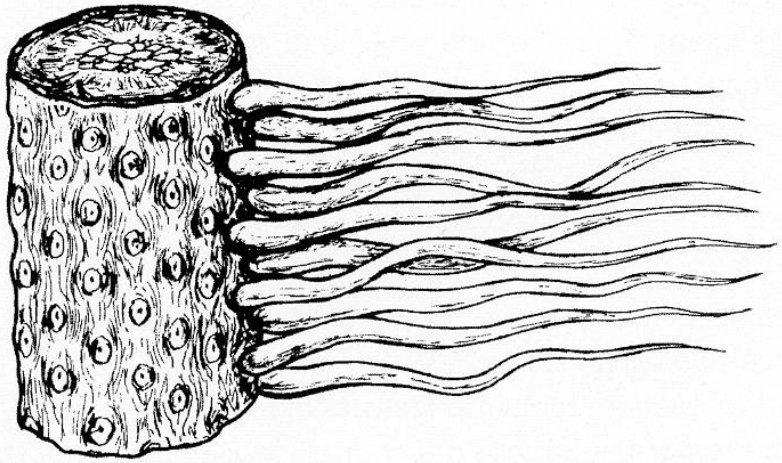


Lepidodendron sp. - površina dela stebla z značilnim vzorcem listnih blazinic (levo), shema listne blazinice (desno).



Stigmaria – podzemni organ drevesastih lisičjakovcev.

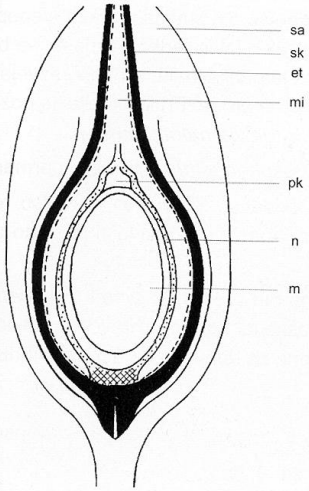
Stigmaria – underground organ of arborescent lycopsids.

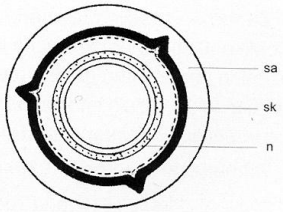


Stigmaria – povečan del korenine s pritrjenimi koreninicami.

Stigmaria – enlarged part of a root with appendices.

Figure 34. Reconstructed *Linopteris* plant showing salient features mentioned in the text.

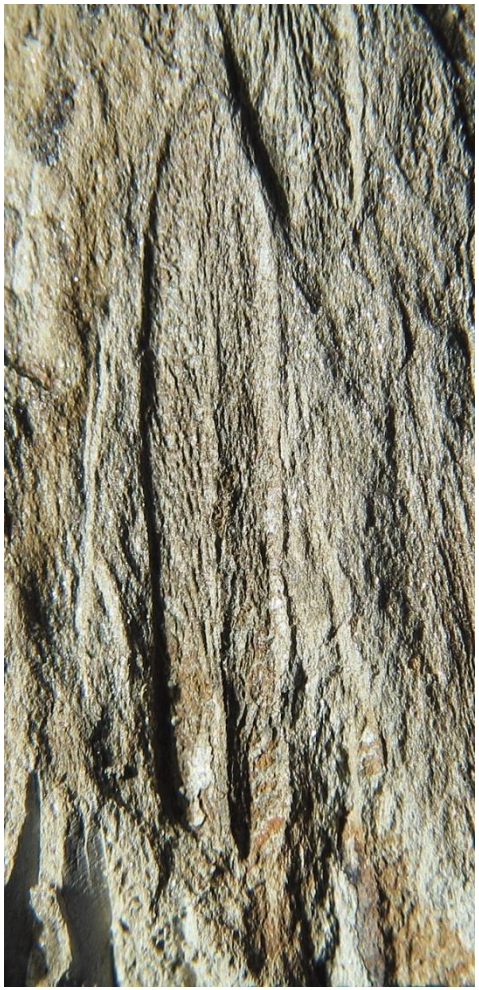


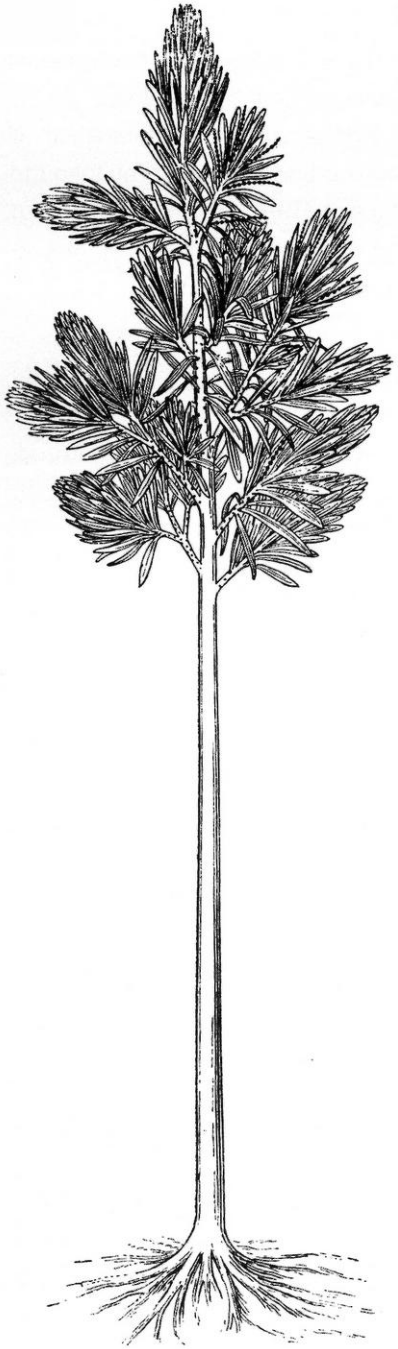


Ovulum *Trigonocarpus* sp. - sa-sarkotesta, sk-sklerotesta, et-endotesta, pk-pelodna kamrica, n-nucelus, m-makrospora, mi-mikropila; vzdolžni (levo) in prečni (desno) presek.

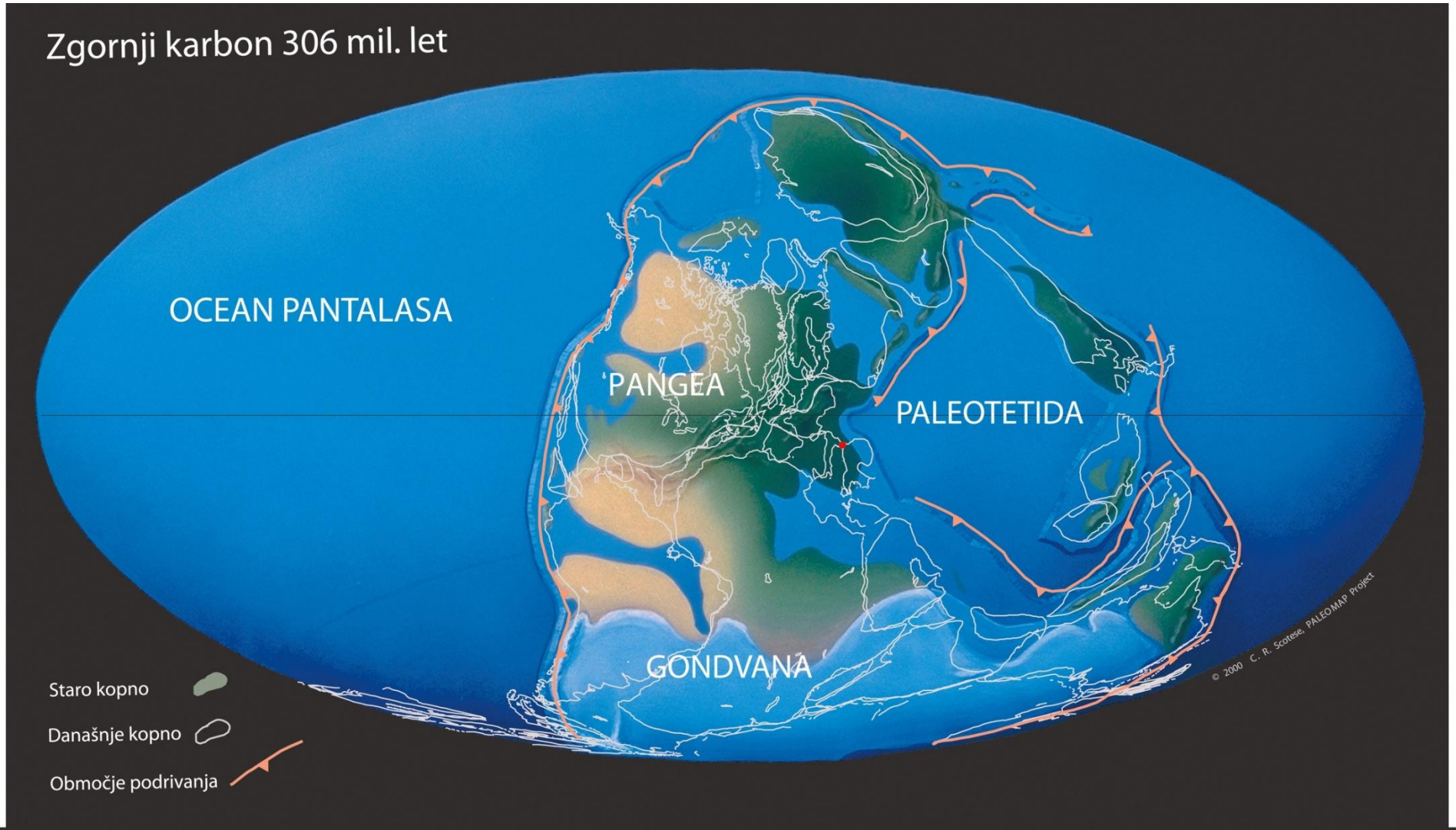
Ovulum of *Trigonocarpus* sp. - sa-sarcotesta, sk-sclerotesta, et-endotesta, pk-pollen chamber, n-nucellus, m-megaspore, mi-micropyle; longitudinal (left) and transverse section (right).

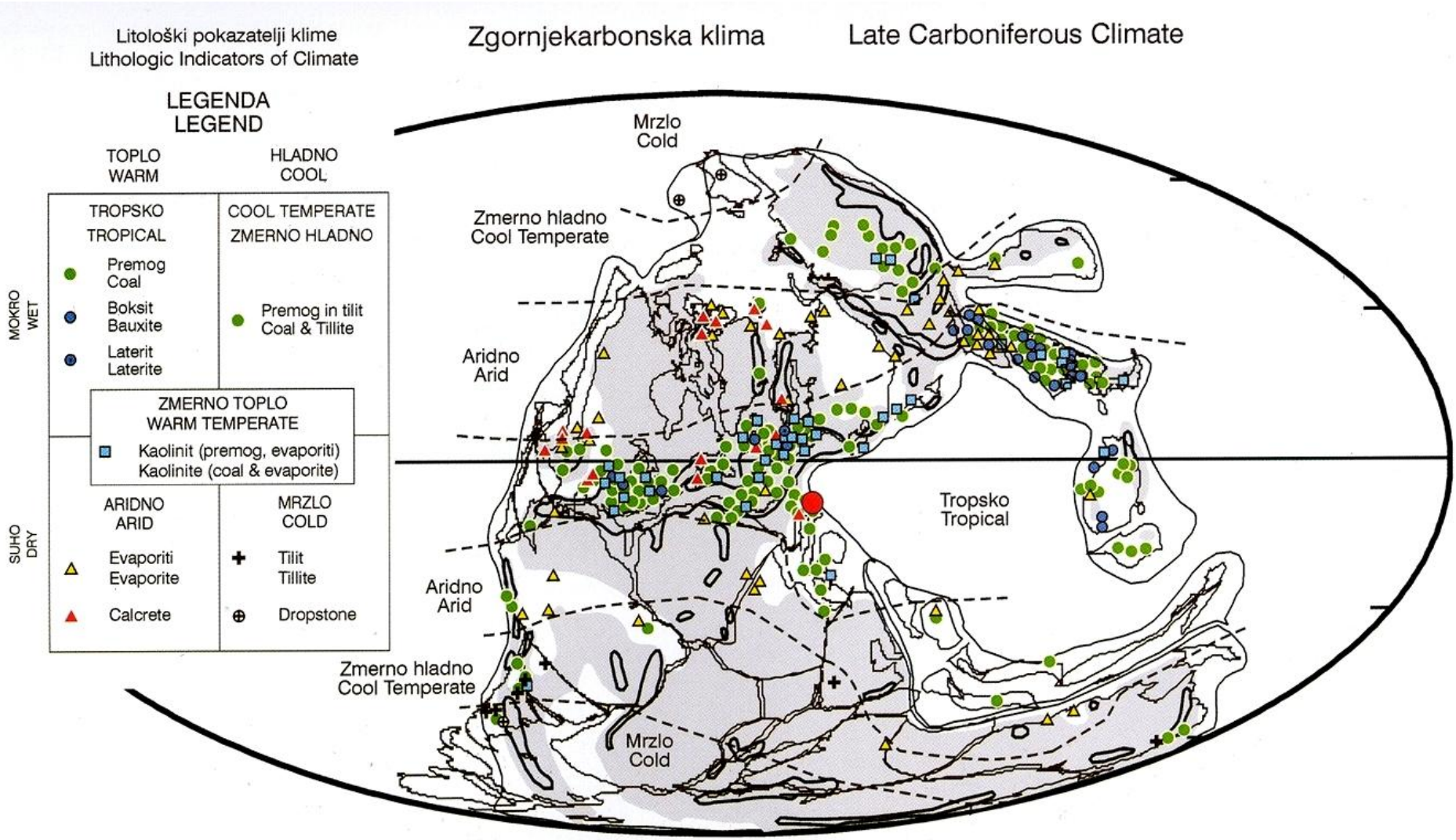
Trigonocarpus sp. – poldrugi centimeter dolgo kameno jedro semena pteridosperme iz Zavrstnika pri Litiji.



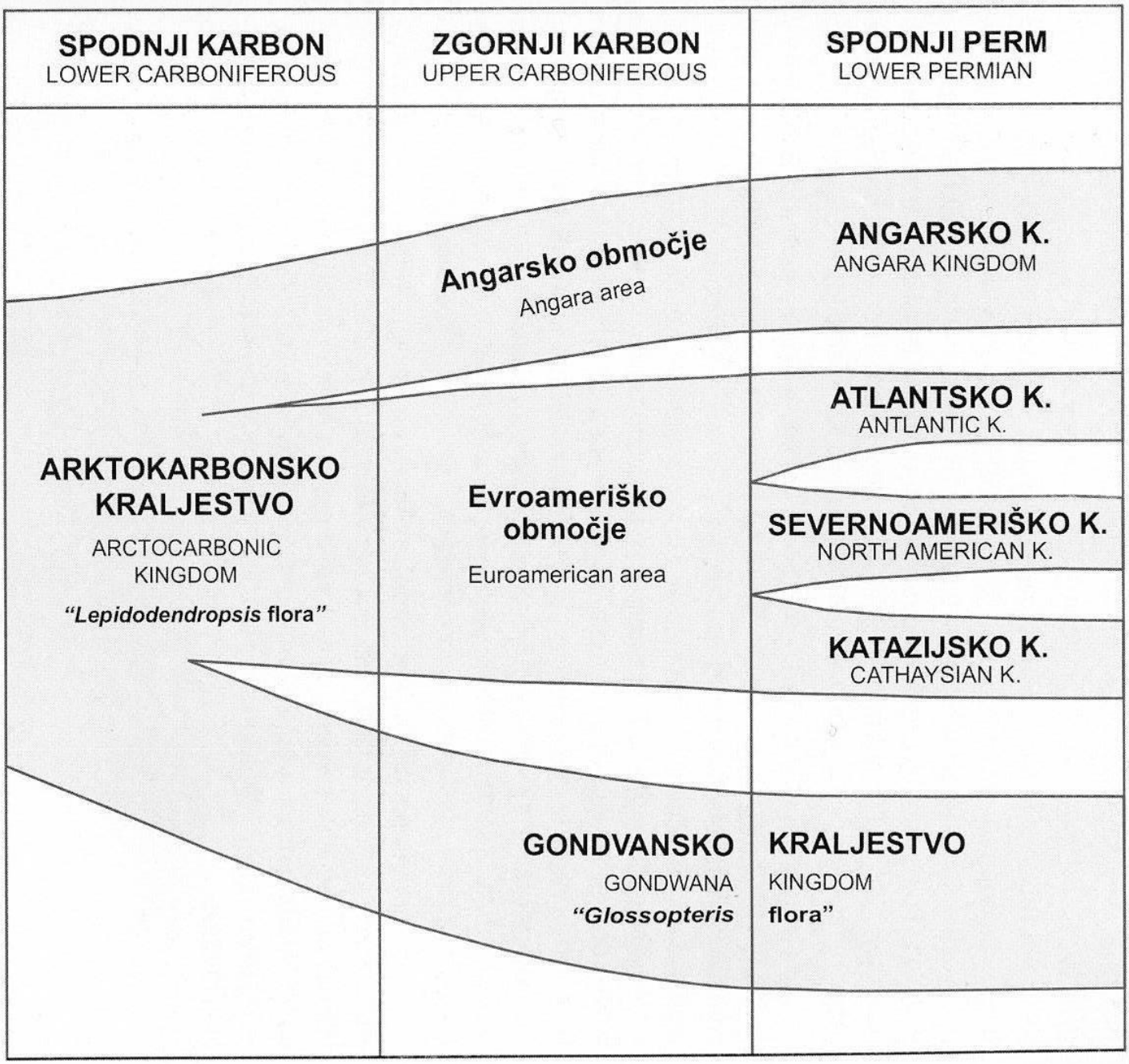


	Okolica Litije	Bizovik	Ljubljanski grad
Calamites haueri Stur	x		
Calamites ramifer Stur	X		
Calamites cf. *ramifer* Stur		x	x
Calamites roemeri Goeppert	X		X
Calamites cf. *roemeri* Goeppert			X
Calamites cistiiformis Stur	X		
Calamites cf. *cistiiformis* Stur	X		X
Calamites suckowi Brongniart	X	x	
Calamites cf. *suckowi* Brongniart		x	
Calamites cf. *cisti* Brongniart		x	x
Calamites undulatus Sternberg		x	X
Calamites cf. *undulatus* Sternberg		x	X
Calamites sachsei Stur	X		
Calamites schuetzeiformis Kidston & Jongmans	X		
Calamites sp.	X	x	
Equistetites cf. *hemingwayi* Kidston	X		
Lepidodendron cf. *aculeatum* Sternberg	X	x	
Lepidodendron lycopodioides Sternberg		x	
Lepidodendron sp.	x	x	X
Lepidostrobus sp.		x	
Asolanus comptotaenia Wood		x	
? *Asolanus* sp.			X
Sigilaria boblayi Brongniart	x		
Sigillaria cf. *boblayi* Brongniart	x		
Sigillaria mamillaris Brongniart	x		
Sigillaria elegans (Sternberg) Brongniart	x		
Sigillaria sp. (*Syringodendron – Rhytidolepis*)	x	x	X
Sigillaria sp.	x		
Stigmaria ficoides (Sternberg) Brongiart		x	X
Stigmaria ficoides var. *undulata* Goeppert	x		
Stigmaria cf. *ficoides* (Sternberg) Brongniart	x		
Pecopteris (Senftenbergia) cf. *plumosa* (Artis) Brongniart		x	
Pecopteris sp.		x	
Eusphenopteris sp.		x	X
? *Mariopteris* sp.		x	
Neuropteris tenuifolia Schlotheim		x	X
Neuropteris cf. *heterophylla* Brongniart			X
Neuropteris sp.		x	
? *Neuropteris* sp.		x	
Linopteris neuropteroides (Gutbier) Zeiller		x	
Linopteris sp. ali *Reticulopteris* sp.		x	
Linopteris sp.			x
Trigonocarpus sp.	x	x	x
? *Carpolithus* sp.	x		
Noeggerathia sp.			x
Cordaites palmaeformis (Geoppert)			x
Cordaites principalis (Germar)			x
Cordaites cf. *principalis* (Germar)		x	
Cordaites sp.	x	x	
Cyperites bicarinatus Lindley & Hutton			x
Cordaicladus sp.		x	
Artisia approximata Lindley & Hutton	x		
? *Artisia* sp.	x		


Zgornji karbon 306 mil. let
OCEAN PANTALASA
PANGEA
PALEOTETIDA
GONDVANA
© 2000 C. R. Scotese, PALEOMAP Project
Staro kopno
Današnje kopno
Območje podrivanja



Obsežni deževni gozdovi v tropskih predelih Pangee so bili omejeni na severu in jugu s puščavami. Prirejeno po Scotese (2001)
Rdeča pika predstavlja paleogeografski položaj Slovenije.


SPODNJI KARBON
LOWER CARBONIFEROUS
ZGORNJI KARBON
UPPER CARBONIFEROUS
SPODNJI PERM
LOWER PERMIAN
Angarsko območje
Angara area
ANGARSKO K.
ANGARA KINGDOM
ATLANTSKO K.
ANTLANTIC K.
ARKTOKARBONSKO KRALJESTVO
ARCTOCARBONIC KINGDOM
"Lepidodendropsis flora"
Evroameriško območje
Euroamerican area
SEVERNOAMERIŠKO K.
NORTH AMERICAN K.
KATAZIJSKO K.
CATHAYSIAN K.
GONDVANSKO
GONDWANA
"Glossopteris
KRALJESTVO
KINGDOM
flora"