Ostracoda from the holo-stratotype of the Badenian (Middle Miocene, Central Paratethys, Austria)

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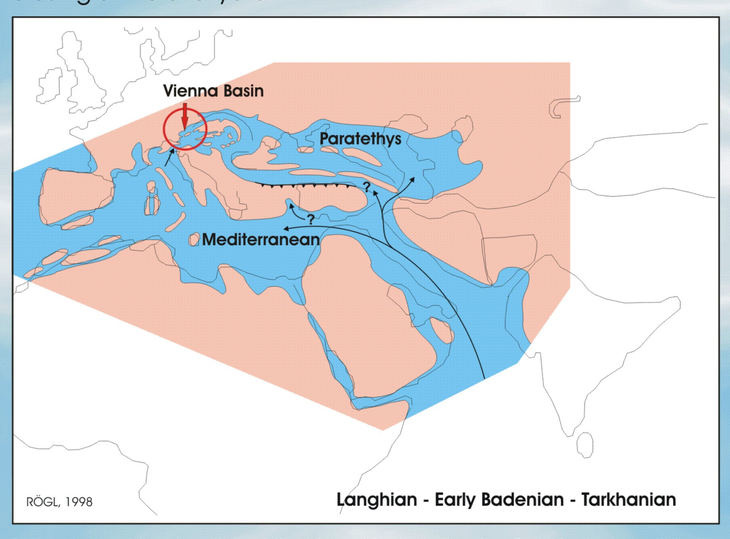
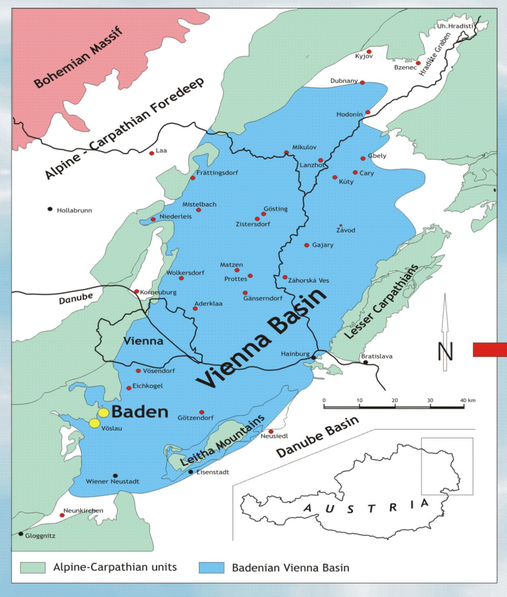
The sediments called **"Badener Tegel"** from the Middle Miocene of the **Vienna Basin** in **Lower Austria** have been investigated since the first half of the 19th century and are famous for their mollusca and foraminifera faunas. REUSS (1850) described the first ostracoda from the surroundings of Baden. Subsequently ostracoda from Baden and **Baden-Sooss** (old Wienerberger brickyard), the later **holo-stratotype for the Badenian stage**, have been rarely treated in detail (TRIEBEL, 1949; KEMPF & NINK, 1993; JANZ & VENNEMANN, 2005). Around 20 species are known in literature. The present study on a 9m high section of the uppermost part of the holo-stratotype brought around 50 species to light. The section had been sampled in cooperation with the Institute of Paleontology and the Natural History Museum in Vienna in the year 1990 shortly before closing of the brickyard.

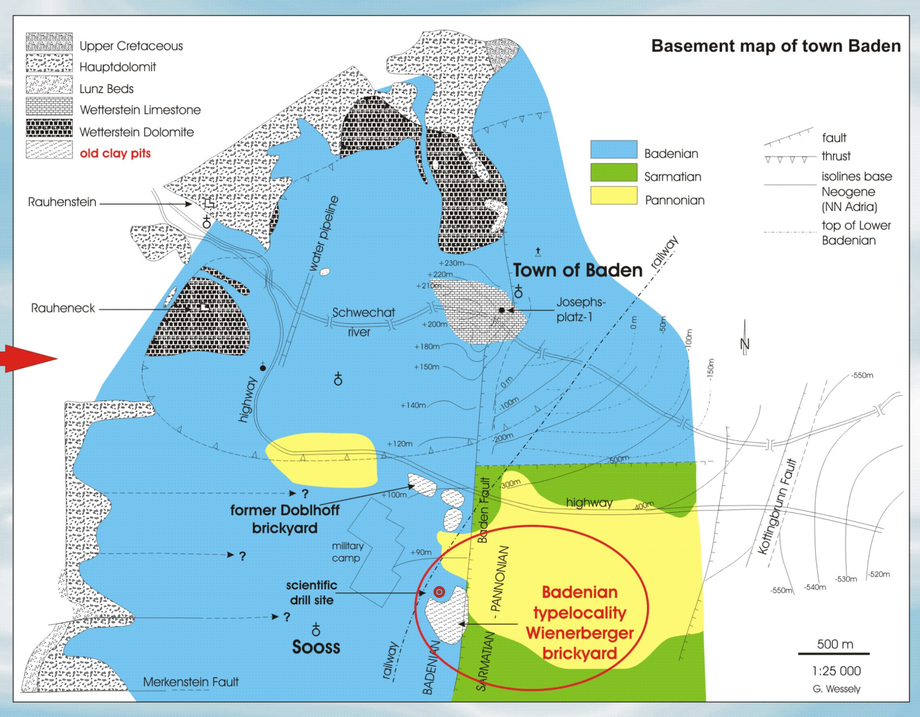


Paleogeographical location of the Vienna Basin during the Early Badenian within the Parathethys.



Geological setting of the Vienna Basin at the Alpine-Carpathian junction and position of the town Baden.

Old Wienerberger brickyard Baden-Sooss.

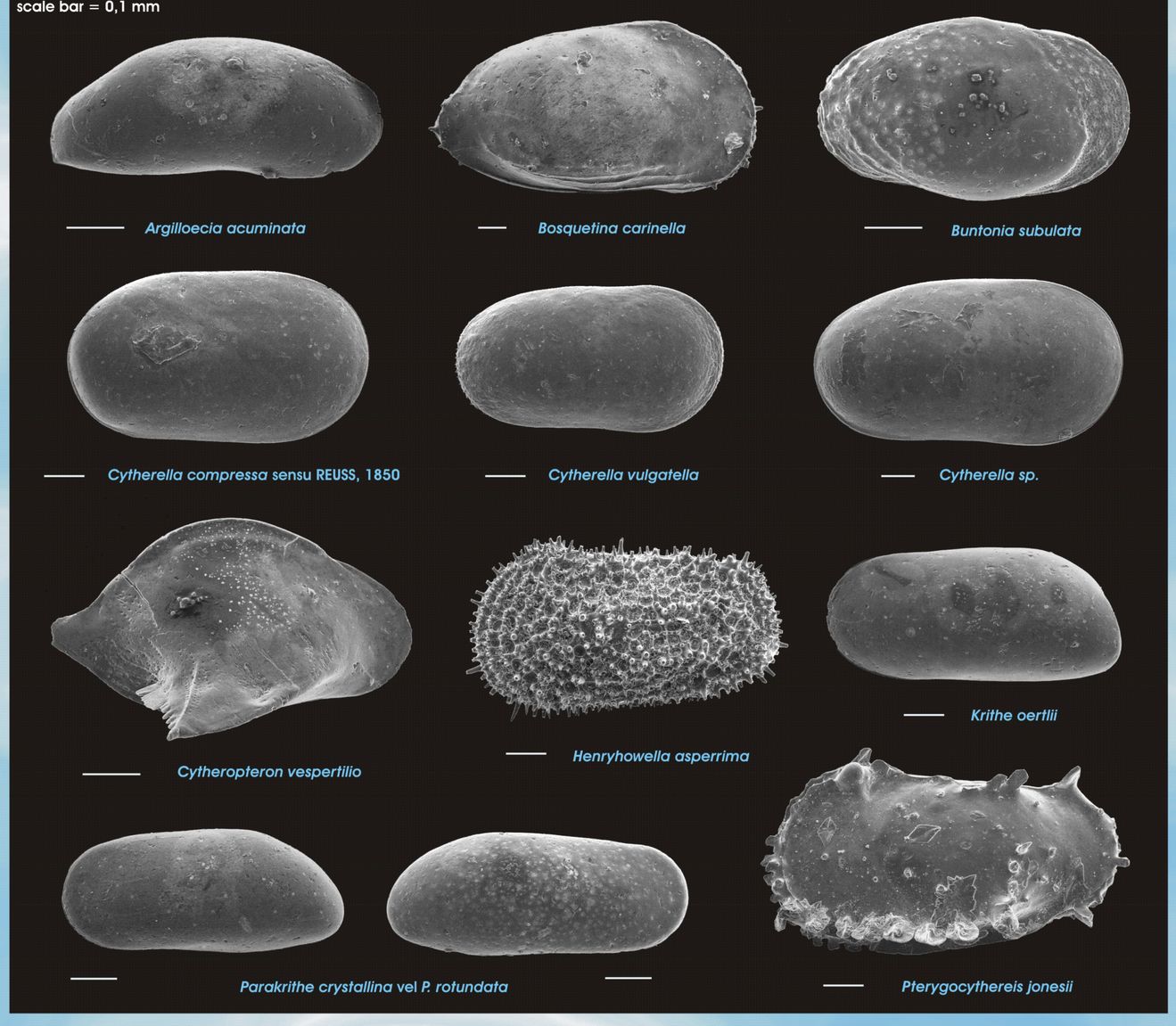


Geological map of the Baden embayment with position of the stratotype Baden-Sooss and other historical clay pits. Distribution of Miocene sediments on a Mesozoic basement of Northern Calcareous Alps (RÖGL et al. in press).

Main elements of the ostracode fauna and paleoecology

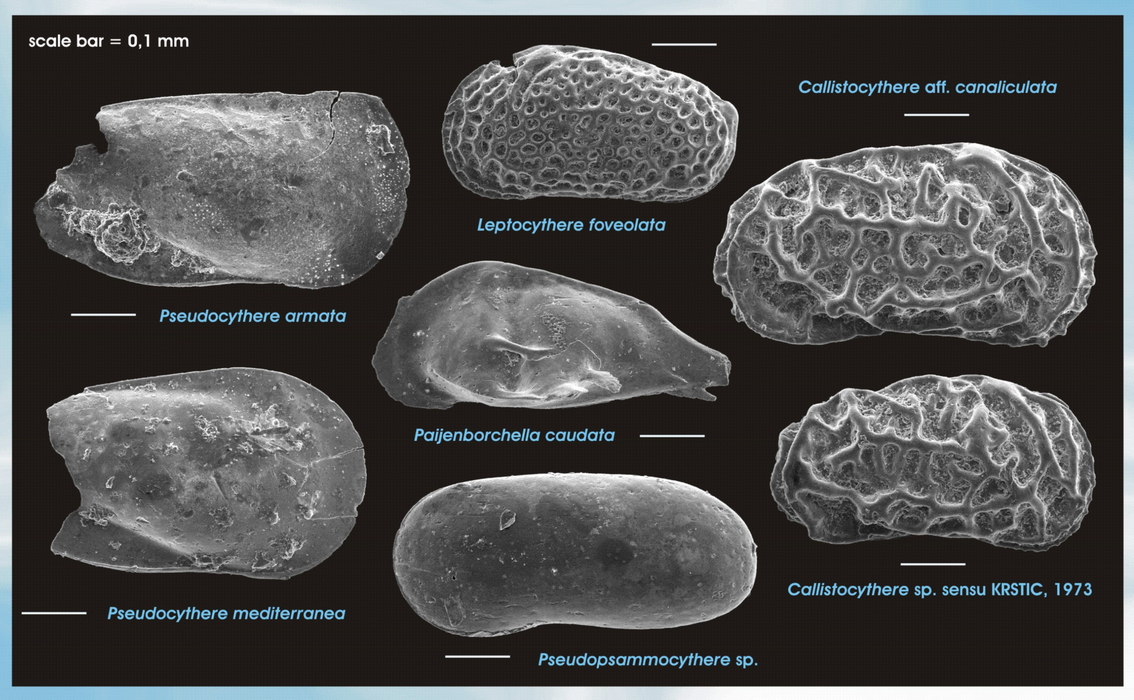
Ostracoda \ Samples	1 (0,0-0,1 m)	10 (0,9-1,0 m)	20 (1,9-2,0 m)	30 (2,9-30 m)	40 (3,9-4,0 m)	50 (4,9-5,0 m)	60 (5,9-6,0 m)	70 (6,9-7,0 m)	81 (8,0-8,1 m)	90 (8,9-9,0 m)
***Argilloecia (Robustoargilloecia) acuminata* G.W.MÜLLER, 1894** *	x	x	x		x	x	x	x	x	x
Aurila angulata (REUSS, 1850)										x
Aurila cicatricosa (REUSS, 1850)	x			x		x	x	x	x	x
Aurila larieyensis MOYES, 1965						x	x			
Aurila sp.									x	
Aurila sp. juv.		x	x		x					x
Bairdia sp.								x		x
***Bosquetina carinella* (REUSS, 1850)** *	x	x	x	x	x	x	x	x	x	x
***Buntonia subulata* (RUGGIERI, 1954)**	x	x	x		x	x	x	x	x	x
Callistocythere aff. *canaliculata* (REUSS, 1850)							x		x	x
Callistocythere daedalea (REUSS 1850)								x	x	
Callistocythere sp. sensu KRSTIC, 1973									x	
Callistocythere sp. juv.		x								
Cnestocythere lamellicosta TRIEBEL, 1950	juv.							?	x	juv.
Costa (Cuneocosta) tricostata (REUSS, 1850)									x	
Costa sp. juv.	x		x			x		x		x
Cyamocytheridea sp.								x		
***Cytherella compressa* (MÜNSTER, 1830) sensu REUSS, 1850**	x	x	x	x	x	x	x	x	x	
Cytherella dilatata (REUSS, 1850)		x	x	x	x	x	x	x		x
***Cytherella* sp.**	x	x	x		x	x	x	?	x	
Cytherella vulgata RUGGIERI, 1962 *	x	x				x	x	x	x	x
***Cytherella vulgatella* AIELLO et alii, 1996**	x	x	x	x	x	x		x		x
Cytheridea acuminata BOSQUET, 1852		x	x	x	x	x		juv.		?
Cytheridea paracuminata KOLLMANN, 1960			x		x					
Cytheropteron aff. *latum* G.W.MÜLLER, 1894						x		x	x	
Cytheropteron aff. *ascolii* CARBONNEL, 1969						x		x		
Cytheropteron sp.						x				
***Cytheropteron vespertilio* (REUSS, 1850)** *	x	x	x	x	x	x	x	x	x	x
Eocytheropteron inflatum SCHNEIDER, 1949						x				
Eucytherura ? sp.						x				
Grinioneis haidingeri (REUSS, 1850)								x		
***Henryhowella asperrima* (REUSS, 1850)**	x	x	x	x		x	x	x	x	x
Krithe compressa (SEGUENZA, 1880) ?						x	x			
***Krithe oertlii* DIECI & RUSSO, 1967**	x	x	x	x	x	x	x	x	x	x
Leptocythere foveolata MOYES, 1965										x
Loxoconcha punctatella (REUSS, 1850)	x	x						x	x	x
Loxoconcha sp.				x	div.	x				
Loxocorniculum hastatum (REUSS, 1850)				x		x	x	x	x	x
Nonurocythereis sp.										x
Olimfalunia ex gr. *plicatula* (REUSS, 1850)		x	x		x	x	x	x	x	x
Paijenborchella (Paijenborchella) caudata (LIENENKLAUS, 1894)						x				
Paracytheridea triquetra (REUSS, 1850)			x			x	x	x	x	x
***Parakrithe crystallina* (REUSS, 1850) vel *P. rotundata* AIELLO et. al., 1993**	x	x	x	x	x	x	x	x	x	x
Pseudocythere (Dopseucythere) armata BONADUCE et al., 1980 *	x									
Pseudocythere (Dopseucy.) mediterranea BONADUCE et al., 1980 *	x						x			
Pseudocytherura calcarata (SEGUENZA, 1880)								juv	juv.	x
Pseudopsammocythere sp.					x	x		x		x
***Pterygocythereis jonesii* (BAIRD, 1850)** *	x	x	x	x	x	x	x	x	x	x
Sagmatocythere sp.								x	x	
Sagmatocythere tenuis (CIAMPO, 1980)	x	x	x		x	x				x
Semicytherura galea (STANCHEVA, 1962) ?								x	x	
Semicytherura sp.			x				x			x
Xestoleberis glabrescens (REUSS, 1850)		juv.				x	x	x	x	x

Distribution of the ostracode species within the samples from top to base of the section. Main faunal elements are marked in red and species still living today in the Mediterranean Sea are marked with a green asterisk (*). The Lower part of the section yiields more species per sample which probably reflects more input from shallow water through storms (see RÖGL et al., In press).



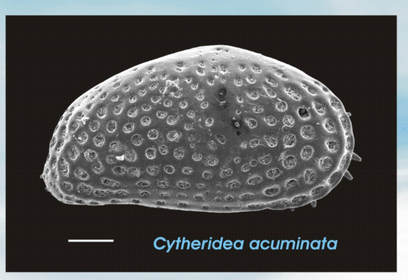
The above shown assemblage indicates an environment at the outer shelf with water depths more than 200 m, which is also confirmed by the rare occurrence of *Pseudocythere armata* and *P. mediterranea*. Other families which are represented are especially the Hemicytheridae, Leptocytheridae, and Loxoconchidae, as well as the genera *Cytheridea*, *Olimfalunia*, *Paracytheridea*, *Pseudopsammocythere* and *Xestoleberis*. Many of these are supposed to represent an allochthonous fauna which was transported from shallower water.

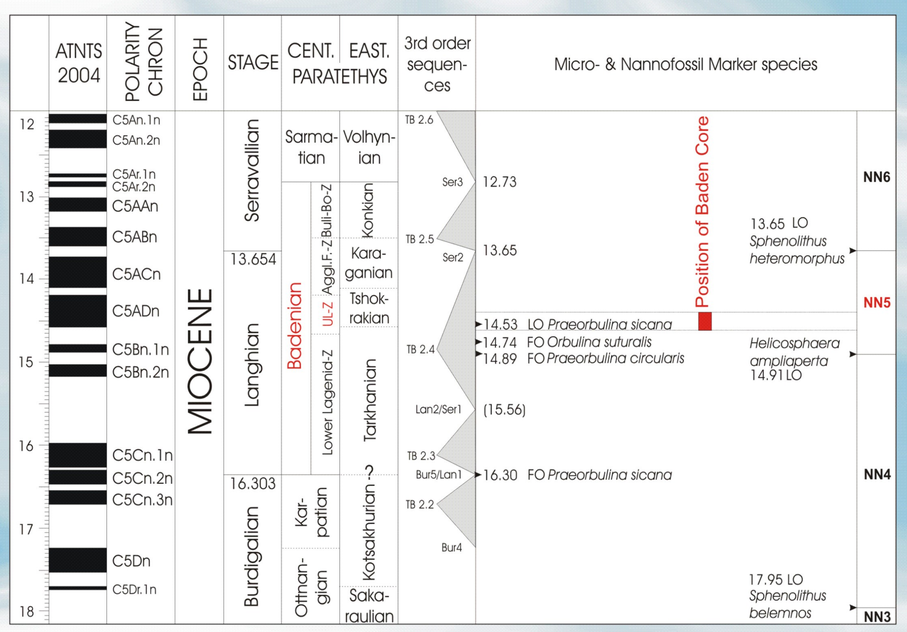
Rare ostracodes in the Vienna Basin



Biostratigraphy

Severall ostracode species recorded from Baden-Sooss in the Central Paratethys are stratigraphically restricted to the Badenian stage, such as *Aurila angulata*, *Bosquetina carinella*, *Cnestocythere lamellicosta* and *Cytheridea acuminata*. Foraminifera and calcareous nannoplankton indicate the lower part of the Upper Lagenidae Zone of the Lower Badenian and the lower part of Zone NN5 (Rögl et al., in press).





Middle Miocene stratigraphy and correlation with the position of the Badenian type-locality and Baden-Sooss drilling. Paleomagnetic chronology (ATNTS2004) and ages of biostratigraphic markers acc. to LOURENS et al. (2004), global 3rd order sequences re-calibrated (RÖGL et al. in press).

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