

# The microfauna (foraminifera, ostracoda) of the Eggenburgian (Lower Miocene) stratotype section and its associated deposits

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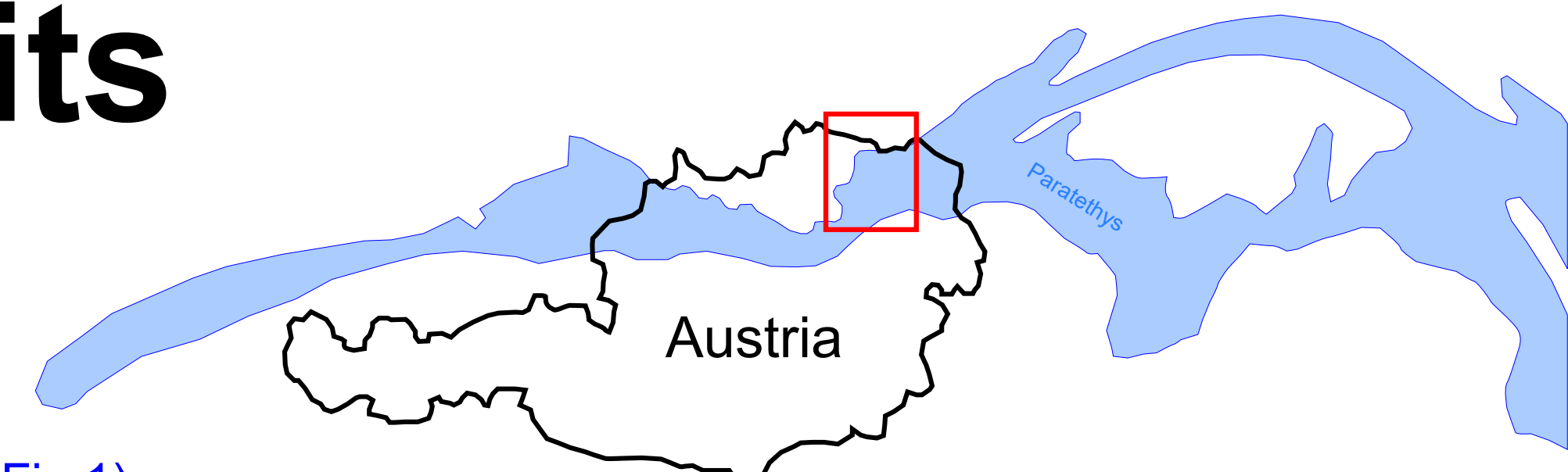
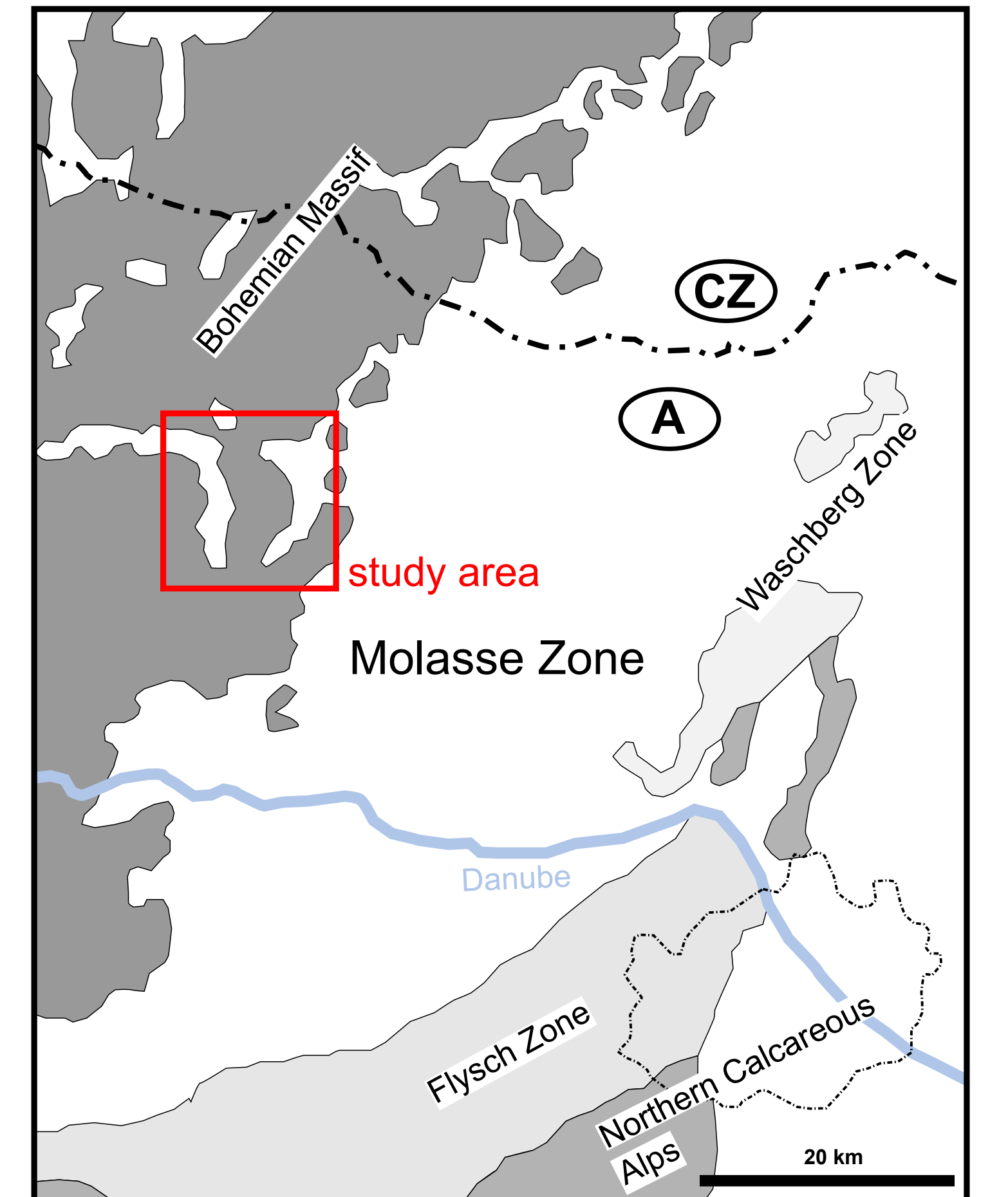


Fig.1: Geographic overview of the study area; Expansion of the Western and Central Paratethys during the basal Eggenburgian (~21 Ma), from Rögl & Steininger (1983)



Zogelsdorf Fm. Gauderndorf Fm.

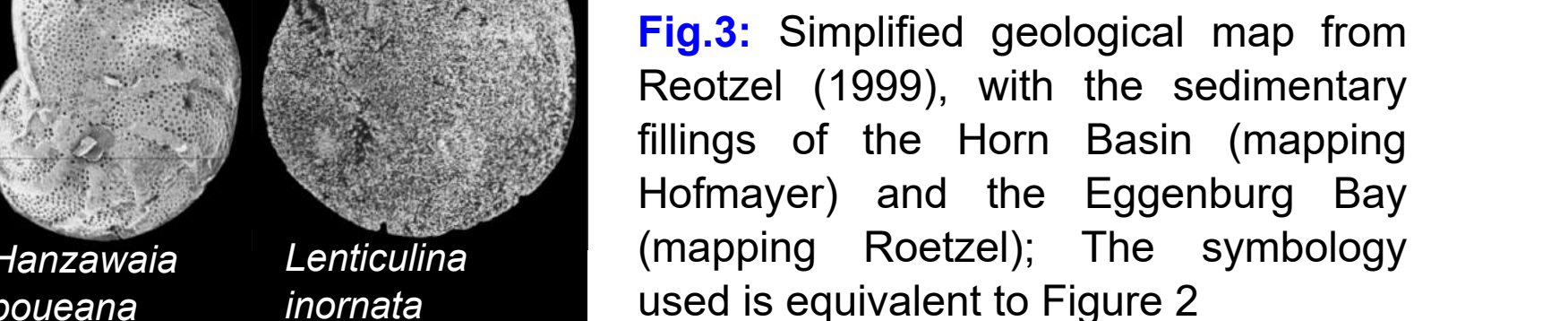
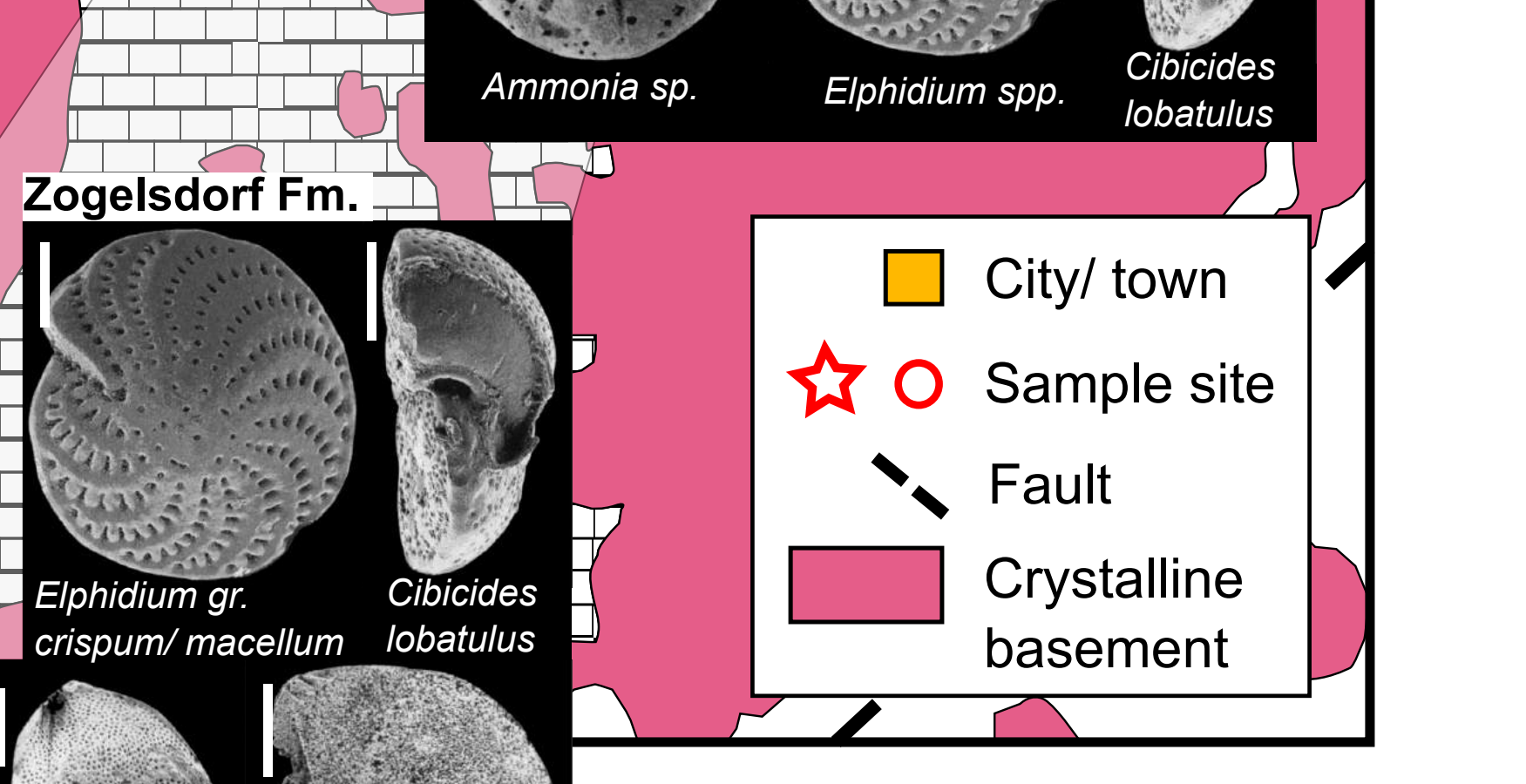
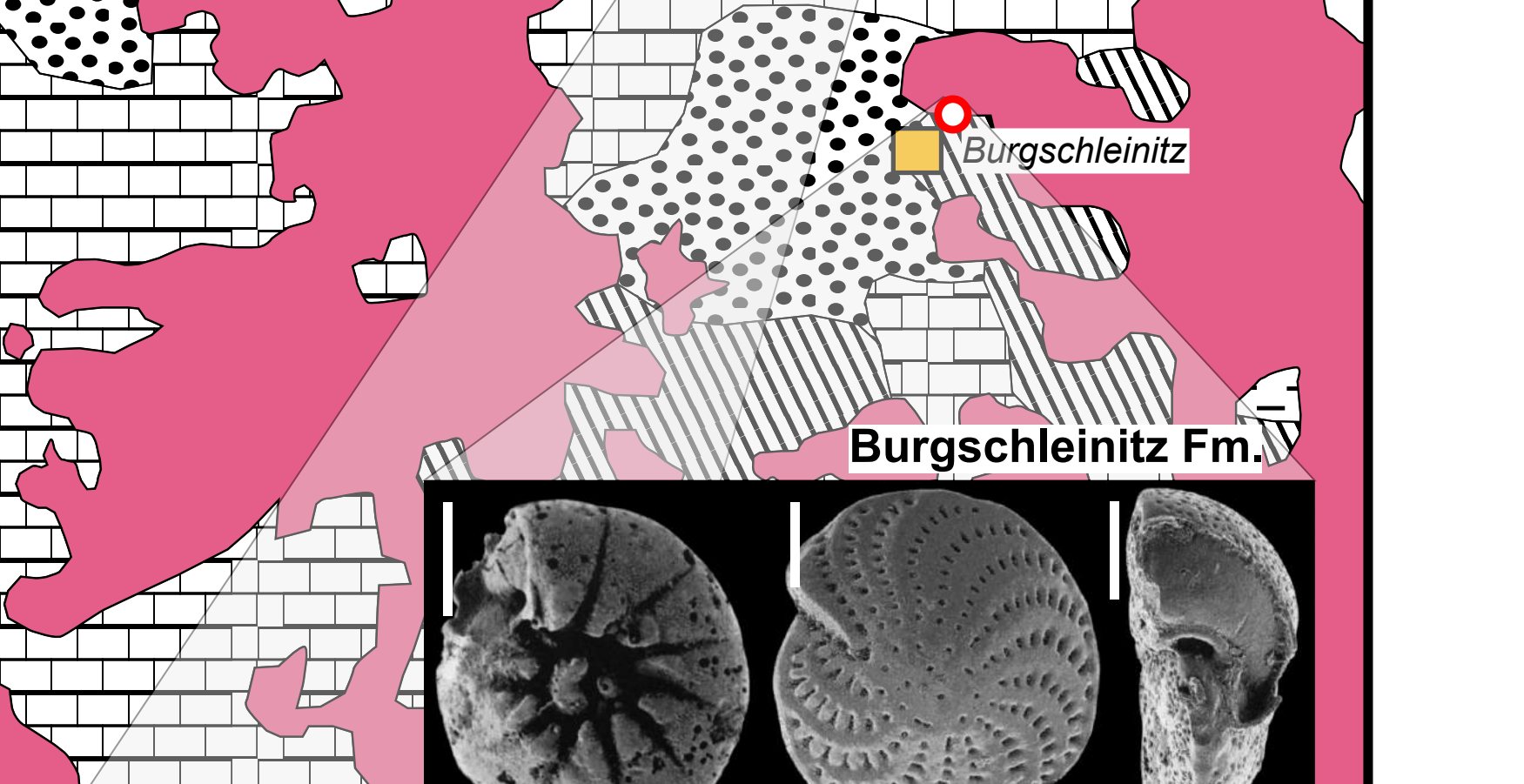
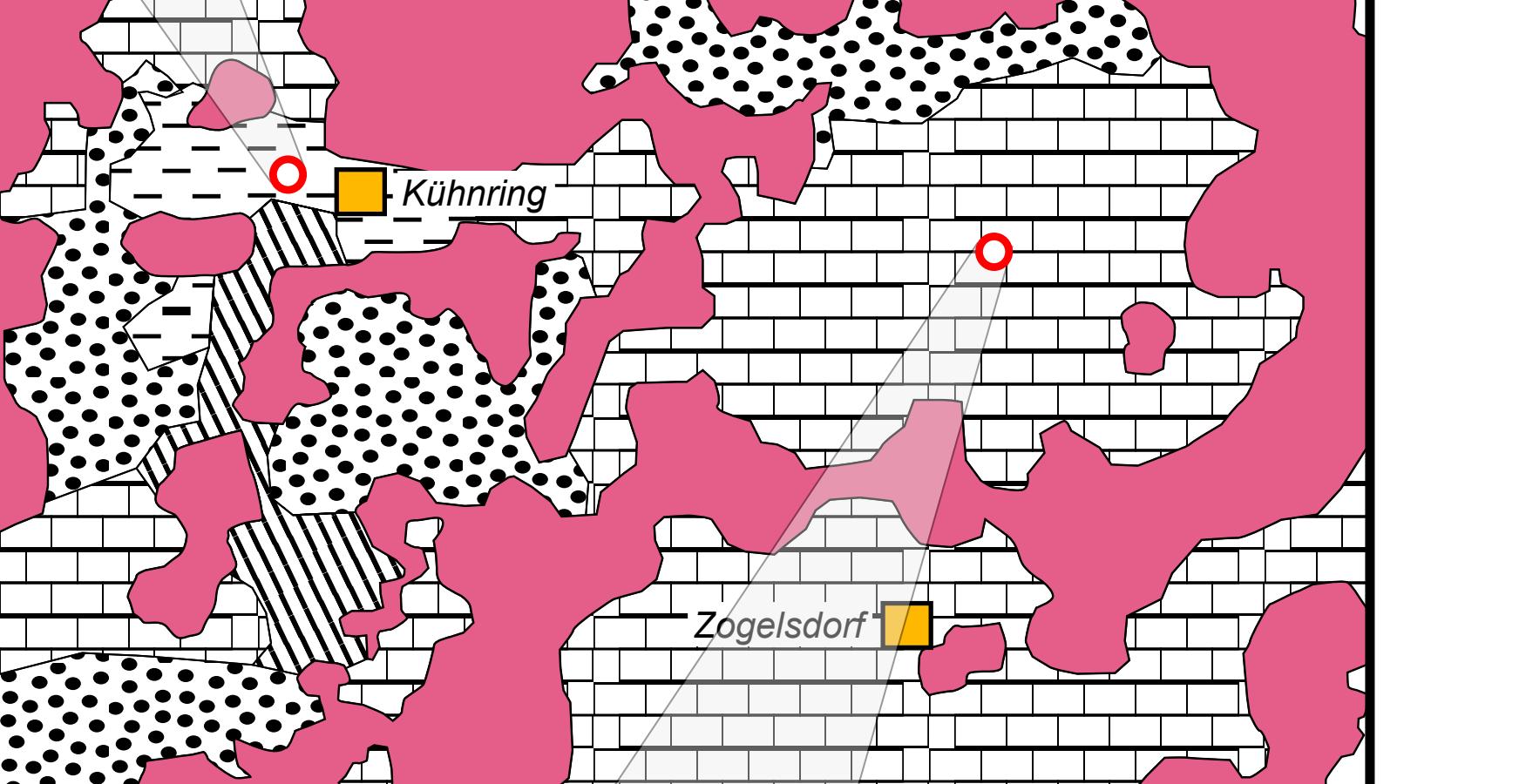
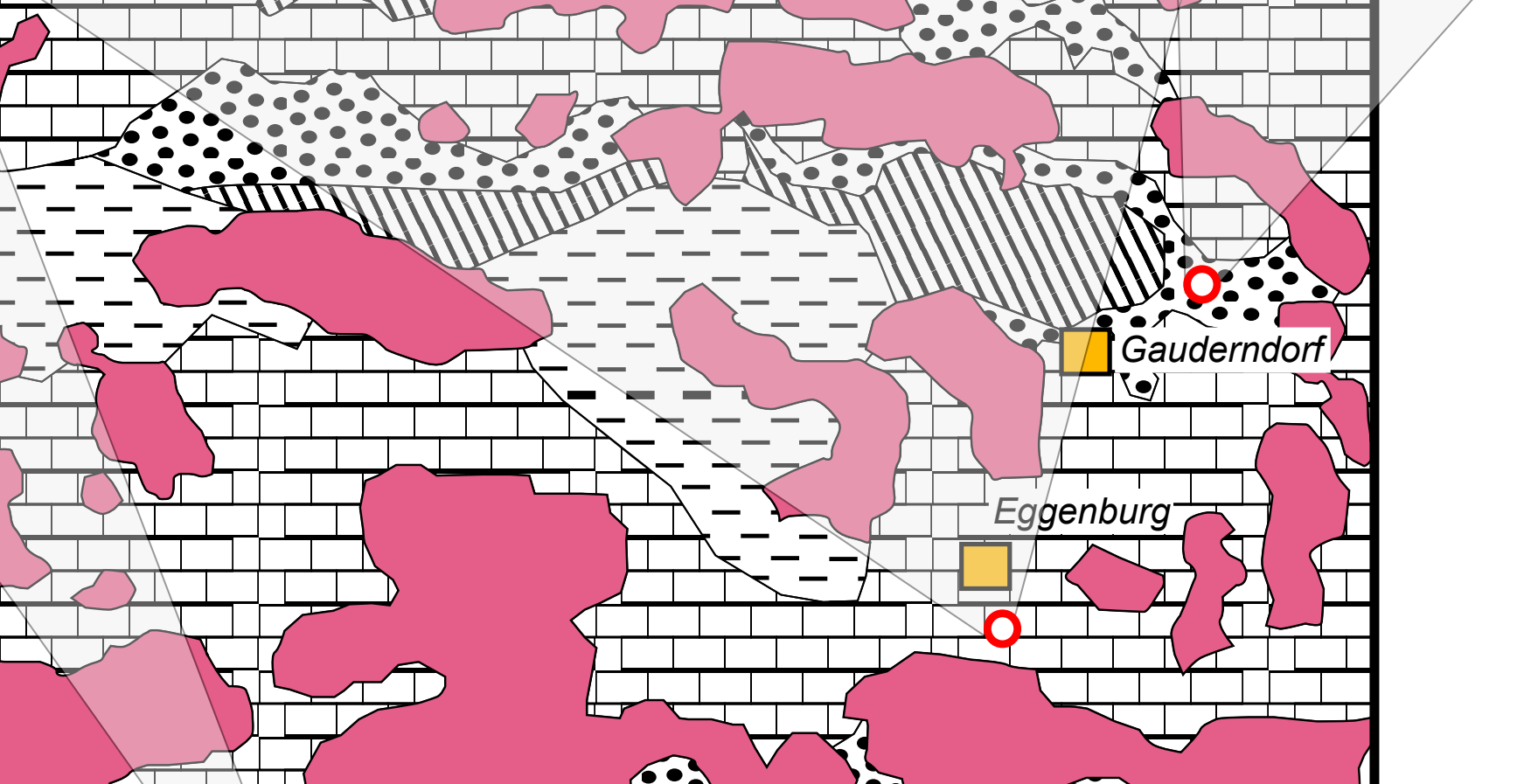
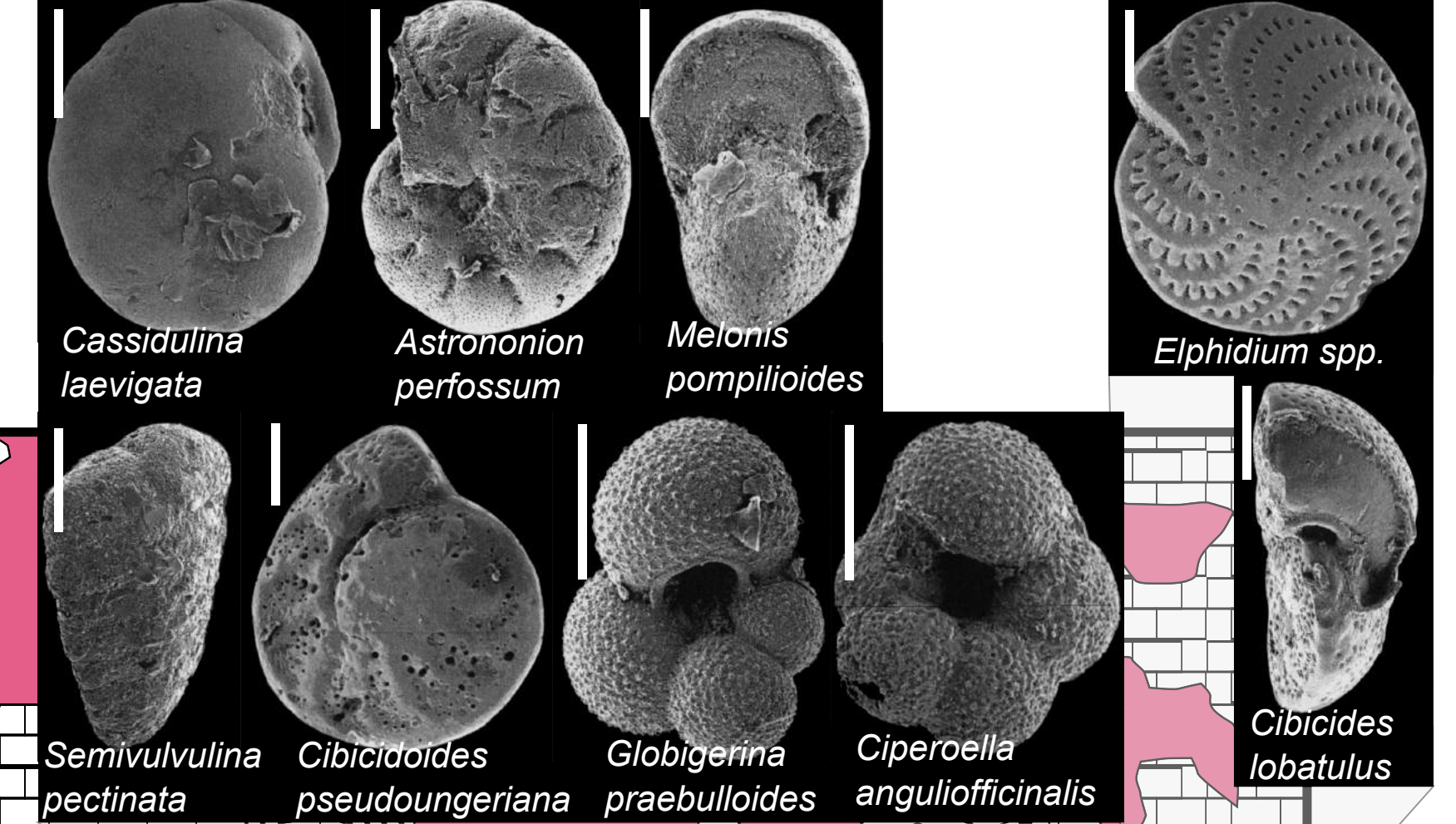


Fig.3: Simplified geological map from Roetzel (1999), with the sedimentary fillings of the Horn Basin (mapping Hofmayer) and the Eggenburg Bay (mapping Roetzel); The symbology used is equivalent to Figure 2

Stratigraphic correlations of Miocene sedimentary records within the Paratethys realm (Fig.1) are problematic, caused by the absence of global marker species. Therefore regional stages have been introduced (Piller et.al 2007) (Fig.2). Anyway, there are still stratigraphic issues unsolved due to lacking comparative material and poorly described sections. For instance is the stratotype section of the regional stage 'Eggenburgian' described using mollusk assemblages, but microfossils are so far not examined. This study presents for the first time the microfauna of this section and its associated deposits.

The Eggenburgian (21.5 – 18.2 Ma) (Piller et.al 2007) documents the final, continuous transgression throughout the Paratethys (Fig.1), accompanied by the uprising of a typical mollusk fauna (Mandic & Steininger 2003). In the Horn Basin of Lower Austria the initial transgressive phase is documented in the sedimentary record by the Mold Formation (clay) and the Loibersdorf Formation (silt; sand) which overlie the Oligocene-Miocene St.Marein-Freischling Formation (gravel; sand) (Roetzel 1999) (Fig.2). A typical brackish mollusk fauna, comprising *Mesohalina*, *Ostrea* and *Mytilus* is hereby replaced by a marine assemblage with the genera *Turritella*, *Glycimeris*, *Chlamys* and *Laevicardium* (Mandic 1997).

The microfauna examined in this study was collected and determined during the mapping campaign of the Austrian Geological Survey (Fig.3). Opportunistic foraminifera of the genus *Ammonia* are dominant in the Mold Formation, accompanied with an ostracod fauna comprising the limnic genus *Ilyocypris*. Whereas the assemblages of the Loibersdorf Formation are very diverse, showing benthic foraminifera of the genus *Elphidium*, dominant are also the genera *Nonion*, *Stilostomella*, *Ammonia*, *Asterigerinata* and *Porosonion*. A very rich fauna was discovered in a silty facies, comprising the planktonic foraminifera *Globigerinella obesa*, *Ciperocella anguliofficialis* and *Globoturborotalita brazieri* (Fig.4).

These assemblages show clearly the described vertical transition from a brackish, to a marine environment. Together with the sedimentological observations in the Horn Basin the foraminifera also document a lateral facies evolution within a single formation. Very typical for the Eggenburgian shallow marine settings is the abundance of large *Elphidium*, such as *E. ortenburgense* (Wenger 1987). Moreover are the species *Virgulopsis tuberculatus* and *Asterigerinata planorbis* present in the Loibersdorf Formation, which are mostly absent in older strata (Pippèr & Reichenbacher 2009). The planktonic species *Globoturborotalita brazieri* from the Loibersdorf Formation confirms an age of 21.1 – 14.8 Ma (Iaccarino & Premoli Silva 2005). Consequently can an early Eggenburgian age be assumed for the Loibersdorf Formation (Fig.1).

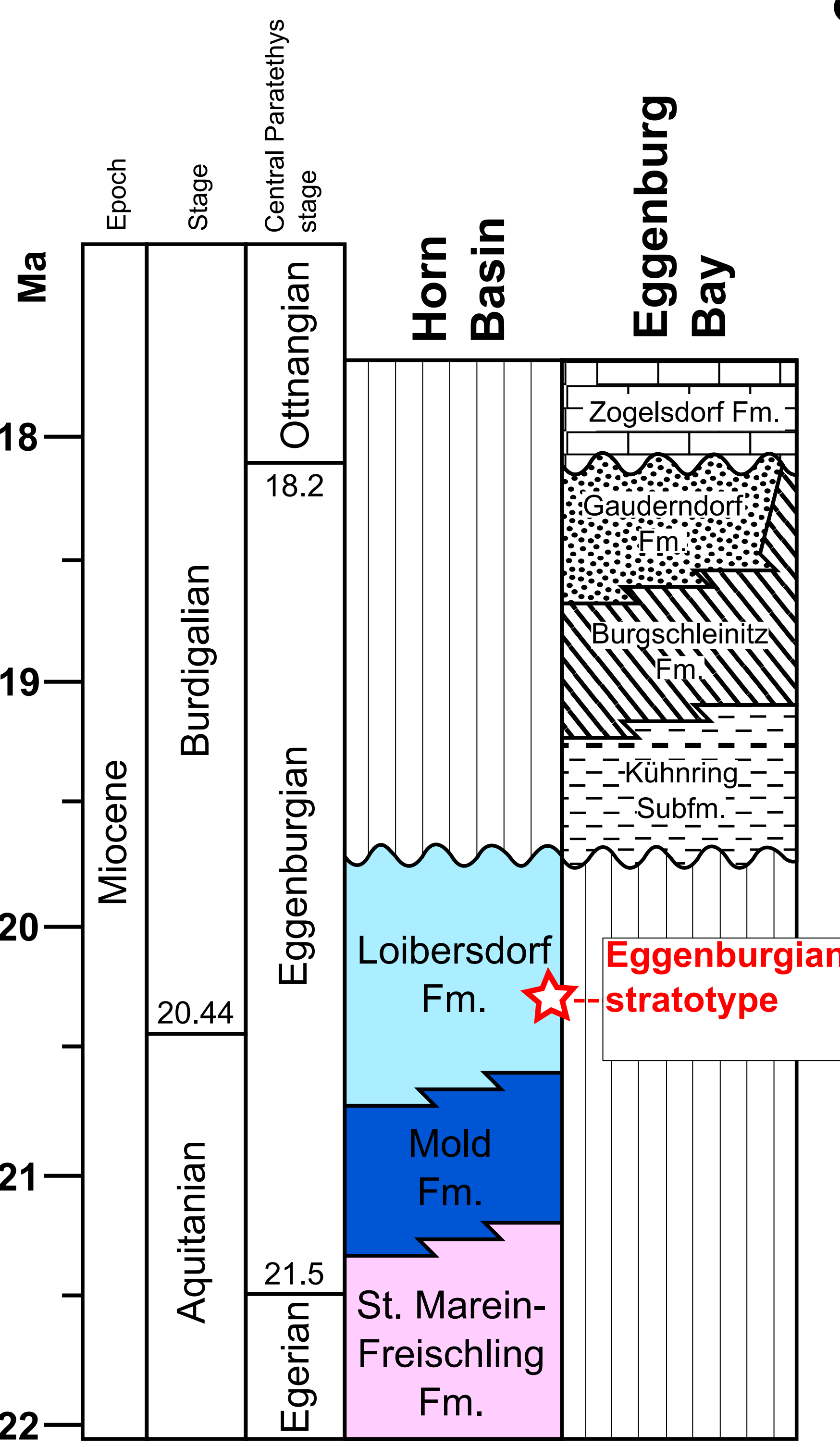


Fig.2: Stratigraphic correlation of the present formations in the Horn Basin and Eggenburg Bay to the Global Time Scale after Roetzel et. al (1999), the symbology used here is equivalent to the geological map of Figure 3

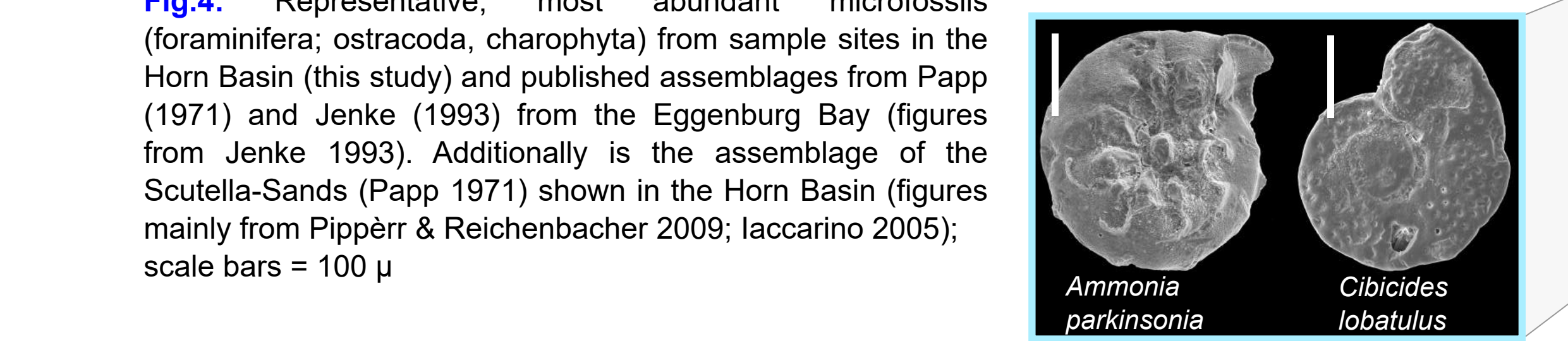
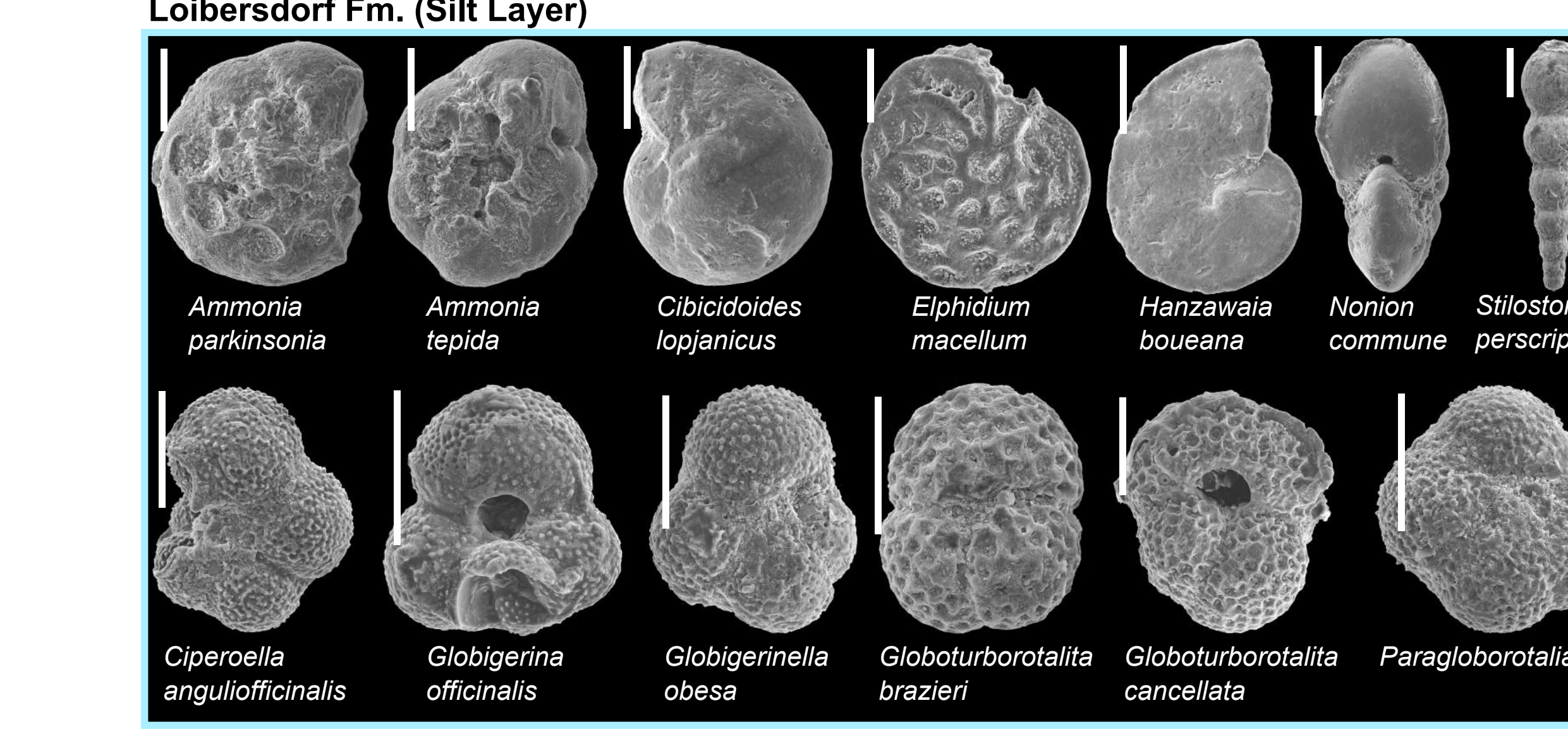
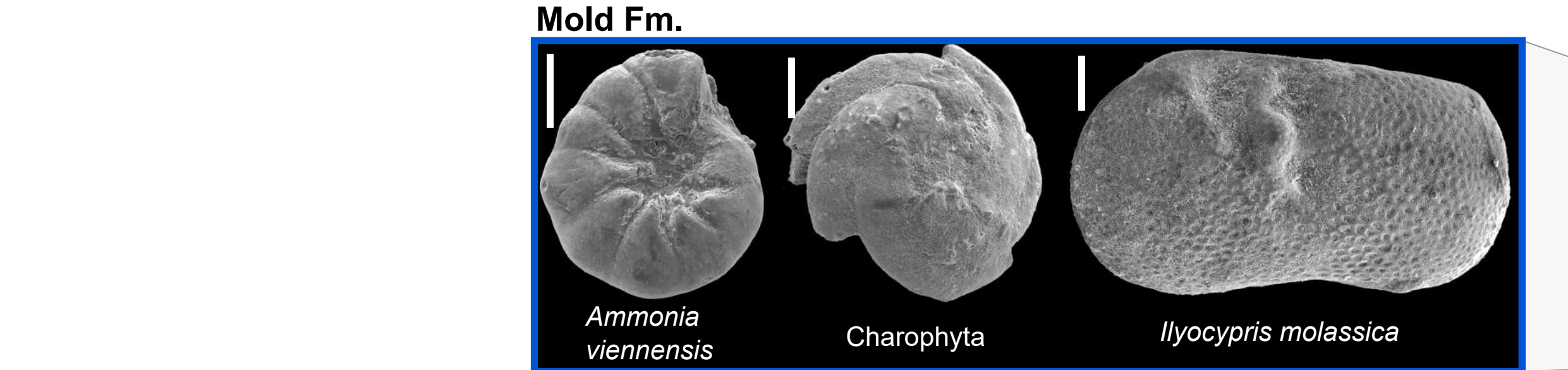
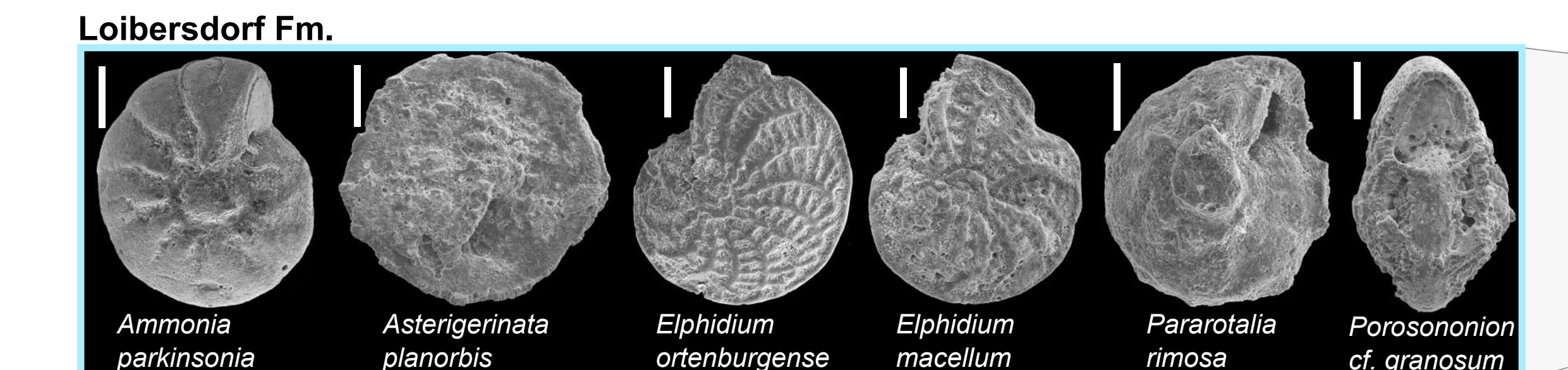
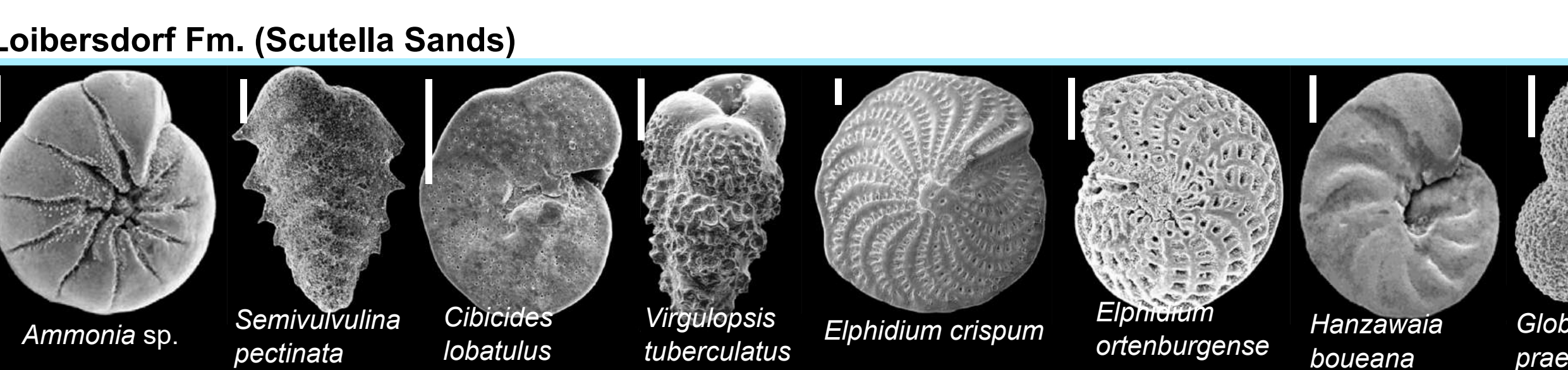


Fig.4: Representative, most abundant microfossils (foraminifera; ostracoda, charophyta) from sample sites in the Horn Basin (this study) and published assemblages from Papp (1971) and Jenke (1993) from the Eggenburg Bay (figures from Jenke 1993). Additionally is the assemblage of the Scutella-Sands (Papp 1971) shown in the Horn Basin (figures mainly from Pippèr & Reichenbacher 2009; Iaccarino 2005); scale bars = 100 μ

References:  
 Iaccarino & Premoli Silva (2005) - Practical Manual of Oligocene to Middle Miocene planktonic foraminifera from the Zogelsdorf Formation (Eggenburgian, Early Miocene) in the Eggenburg area (Austria)  
 Jenke (1993) - Palaeoecological studies of benthic foraminifera from the Zogelsdorf Formation (Eggenburgian, Early Miocene) in the Eggenburg area (Austria)  
 Mandic (1997) - Mollusken des Horner Beckens (Unter Miozän, Eggenburgium)  
 Mandic & Steininger (2003) - Computer-based mollusc stratigraphy - a case study from the Eggenburgian (Lower Miocene) type region (NE Austria)  
 Papp (1971) - in: Steininger & Senes (1971) - Chronostratigraphie & Neozatotypen: M1 Eggenburgien  
 Piller et. al (2007) - Miocene Central Paratethys stratigraphy - current status and future directions  
 Pippèr & Reichenbacher (2009) - Biostratigraphy and paleoecology of benthic foraminifera from the Eggenburgian "Ortenburger Meeresande" of southeastern Germany (Early Miocene, Paratethys)  
 Roetzel et. al (1999) - Lithostratigraphie und Chronostratigraphie der tertiären Sedimente im westlichen Weinviertel und angrenzenden Waldviertel  
 Steininger & Senes (1971) - Chronostratigraphie & Neozatotypen: M1 Eggenburgien  
 Wenger (1987) - Die Foraminiferen des Miozän der bayrischen Molasse und ihre stratigraphische sowie paläogeographische Auswertung