The Posidonia Shale

Why is the Posidonia Shale an Important Site?

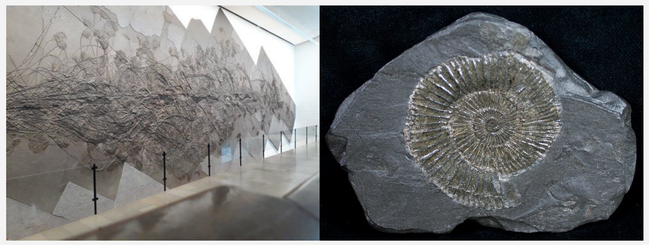
The Posidonia Shale, also called the Posidonienschiefer, is a Lagerstatten of many marine fish and reptiles. The Shale gets its name from the plethora of Posidonia bronni fossils found at the site. This fossil site has given us information about the fauna and flora of the early Jurassic in the area and the interactions between them. The largest fossil Sea Lilies ever found were found in this Lagerstatten![2] This site is known as the principal source rock for petroleum in the North German Basin, and was used in a study about porosity.[4]

Fossils Found at the Posidonia Shale[6]

- Layers show lower marlstone, middle calcareous shale with bivalve shells, and upper calcareous shale.

- Clay and organic matter relationships suggest that land-derived nutrients controlled phytoplankton productivity
- benthic bivalves in the middle shale indicates that bottom water tolerable to epibenthos sometimes prevailed

- A liquid hydrocarbon phase found through a study of calcite-filled horizontal fractures show researchers a reflection of a mobile hydrocarbon phase entrapped within the shale



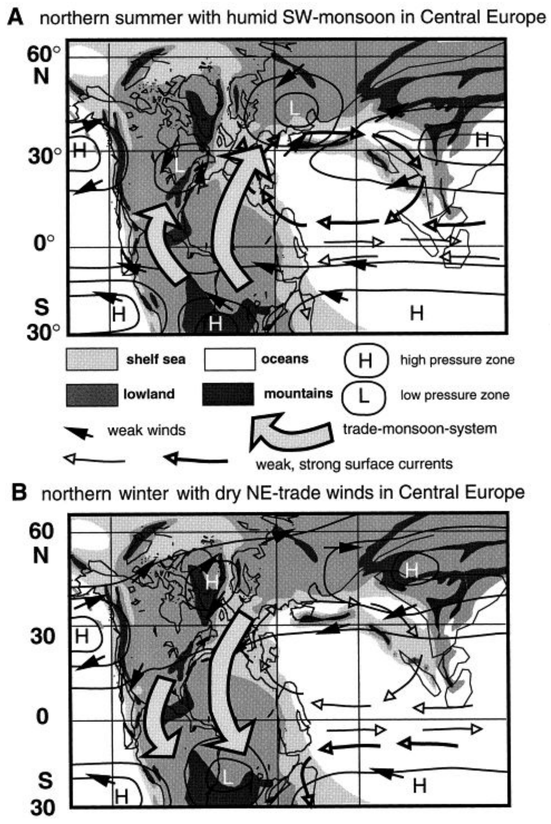
How Old is the Posidonia Shale?

The Posidonia Shale was formed during the Early Jurassic epoch of the Jurassic Period, making it about 175 to 200 million years old.[7]

Paleoclimate of the Posidonia Shale

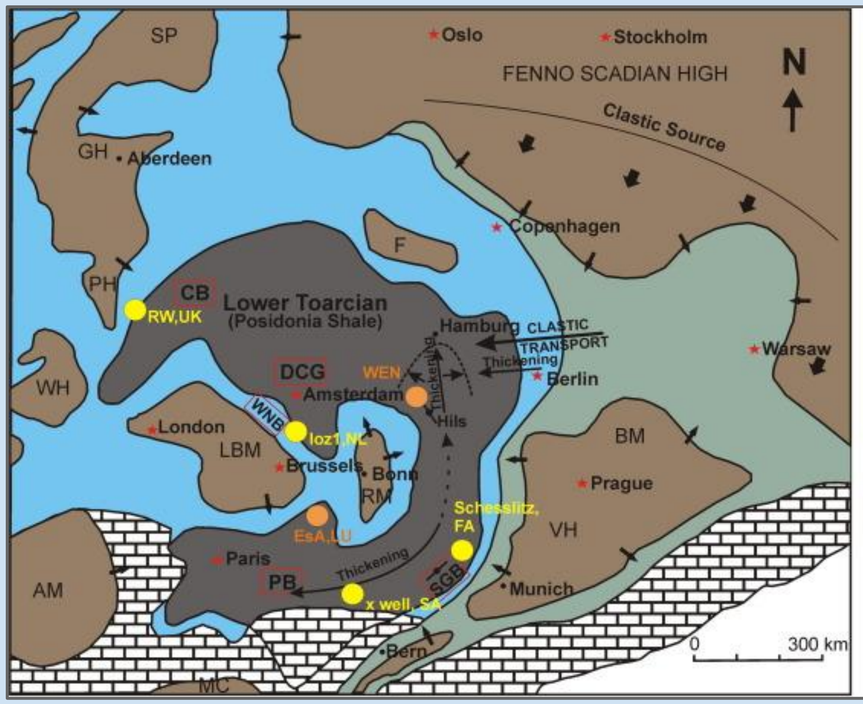
A Mega-Monsoon Climate![9]

- Alternation of humid conditions dominated by monsoonal rain and aridity with high evaporation rates.
- Strong meridional atmospheric circulation with large seasonal changes of trade-wind and monsoon-wind systems
- In summers:
  - Estuarine circulation
  - Positive water balance
  - Surface water with reduced salinity
  - Anoxic conditions
- In winters:
  - Anti-estuarine circulation
  - Negative water balance
  - Oxygen brought to benthic environment



The tropical/subtropical circulation pattern during the Early Jurassic[8]

Where is the Posidonia Shale?



- Located in South-Western Germany
- Bounded above by the Werkendam Formation[1]
- Bounded below by the Aalburg Formation[11]

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