

Holocene mollusc faunas in a northern German lowland river system of the Baltic Sea region (Peene River, Mecklenburg-Western Pomerania)

¹University of Greifswald, Institute of Geography and Geology, Greifswald, Germany;

²Brandenburg State Office for Mining, Geology and Raw Materials (LBGR), Cottbus, Germany;

³Leibniz Institute for Baltic Sea Research Warnemünde (IOW), Biological Oceanography, Rostock, Germany;

⁴Goethestraße 24, 23970, Wismar, Germany;

⁵State Office for the Environment, Nature Conservation and Geology Mecklenburg-Western Pomerania (LUNG), Güstrow, Germany;

stefan.meng@uni-greifswald.de

Despite the numerous Holocene deposits of northern Germany, e.g., lake sediments or calcareous fen formations, hardly any coherent sequences are known that also reflect the development of the molluscs in relation to the diverse climate and landscape history. One exception is the Holocene sequence of Meschendorf (Mecklenburg), for example, with an almost complete profile series from the Preboreal to the Subatlantic, whose species-rich terrestrial faunas reflect the Holocene landscape development very detailed (Hensel et al., 2022).

With the new study on depositional sequences in the lower Peene River area, the Holocene faunal development in a river system can now be examined in more detail for the first time.

The Peene River in NE Germany (Mecklenburg-Western Pomerania) is a typical coastal river with no connection to a larger river system. After about 180 km, the Peene flows into the Baltic Sea near Anklam via the so-called Peenestrom. The Peene valley itself forms one of the largest contiguous lowland peatlands in Central Europe.

In 2007, several liner boreholes were drilled at the crossing of the Peene valley near Stolpe village for the engineering geological exploration of the OPAL natural gas pipeline construction. The borehole (lg Stp 8/007) was drilled directly in the present-day Peene River course. In addition to limnic-fluviatile Eemian sequence (MIS-5a) at a depth of 23-25 m and Weichselian glacial deposits (MIS-2) (Meng et al., 2009), a 10 m thick Holocene sequence was recorded. The Holocene sediments are predominantly fine-grained, often organic muds, and contain only some sand and gravel layers in the lower part. The current overlying water column of the Peene at the drilling point is about 2 m. The section ranges from the Preboreal/Boreal transition to the Atlantic, Subboreal and older Subatlantic. The younger Subatlantic is obviously disturbed. The dating based on pollen stratigraphic investigations (Strahl, 2009) and additional ¹⁴C dating of molluscs (unpubl.).

A total of over 50 freshwater mollusc species (Bivalvia, Gastropoda) were found in the Holocene sediments of the Peene River system. Terrestrial elements were almost completely absent.

The surprising result is that the limnic-fluviatile faunas in the Peene area were relatively stable during the whole Holocene and were apparently hardly influenced by climatic and landscape developments, which clearly contradicts the development of terrestrial mollusc faunas, e.g., from Meschendorf (see Hensel et al., 2022). The Eemian faunas of the Peene are also already comparable to the modern faunas of the Holocene, but differ significantly from the still conservative fluviatile faunas of Holsteinian (Meng et al., 2009).

Despite the short distance from Stolpe to the Baltic Sea coast and the low elevation, today only slightly above 0 m above sea level, no marine/brackish influences could be detected for the Holocene development of the Peene by molluscs.

The Holocene faunas are also relevant to nature conservation, as they also allow a clear reference and comparison to the recent faunas of the Peene. The focus is on the following questions: Which mollusc species have recently become rare due to anthropogenic influences or what are neozoa and which species have only recently immigrated (Zettler, 1998) or are there species that have been misinterpreted in this context?

Hensel, R., Janke, W., Meng, S. & Lorenz, S. (2022): Stratigraphie und Genese eines karbonatreichen Beckenprofils am Kliff von Meschendorf (Ostsee, Nordwestmecklenburg). – Brandenburger Geowissenschaftliche Beiträge, 28 (1/2): 97-124.

Meng, S., Börner, A., Strahl, J. & Thieke, H.-U. (2009): Bio- and lithostratigraphical investigations of Eemian fluviolimnic sediments and tills from the lower Peene-valley (NE-Germany). – *Polish Geological Institute Special Paper*, 25: 37-48.

Strahl, J. (2009): Bericht zur pollenanalytischen Bearbeitung der Bohrungen Ig StpWo 6/007, 8/007 und 9/007, Peenetalquerung OPAL-Trasse, Land Mecklenburg-Vorpommern. - Bericht LBGR, 21 pp., Kleinmachnow (unpubl. report).

Zettler, L.M. (1998): Die Wassermollusken im Einzugsgebiet der Peene (Nordostdeutschland). – *Malakologische Abhandlungen*, Band 19, Nr. 13: 127-138.

Session: DEUQUA Session: Terrestrial records of paleoenvironments and – climates

Keywords: Quaternary palaeontology, molluscs, Holocene, river, NE Germany