



Evidence of ocean circulation change from European eel remains in archaeological and palaeontological sites

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The European eel (*Anguilla anguilla*) spawns in the Sargasso Sea and depends on the Gulf Stream/North Atlantic Drift to complete its larval migration to the coasts of Europe and North Africa. The spatial distribution of the fish was very different in historic and prehistoric times in comparison to the present. A database of the spatial and temporal distribution of eel remains in archaeological and palaeontological sites is presented and used to assess the spatial distribution of populations from the height of the last glacial maximum. The results show that the eel was absent from northern Europe until about 11000 years ago. The reason was probably due to a southerly displacement of the Gulf Stream carrying the larval migration from the Sargasso Sea. However, additional factors preventing eel populations in northern Europe may have also been the colder temperatures in the Arctic tundra landscape that existed at the time and the extreme distance to the European Atlantic coast along the Channel River. The archaeological record shows that eels were absent from the Baltic Sea until about 6700 cal BC, but there is some indication of an earlier presence during Yoldia Sea stage at the beginning of the Holocene. Only in southern Europe south of the Gironde river basin were eel populations maintained through the last glaciation. The species may have survived the last glaciation in a relatively restricted area in the Mediterranean and the Atlantic coast of western Europe. Published palaeontological and genetic information gives important insights into climatic, geologic, and tectonic events on longer time scales.