Mid-Pleistocene molluscan migration to Iceland and its palaeoceanographic implication

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Four marine molluscan species that migrated to Iceland during the deposition of the sedimentary sequences on the north side of Snæfellsnes, western Iceland, at about 1.1 Ma, are not living in Iceland today. Only one of them, *Portlandia arctica*, is found elsewhere in Icelandic sediments, either older or younger. Three of those species reached the area during the final stages of a glacial period and the fourth during the following interglacial, together with the prosobranch *Nucella lapillus,* now living in Iceland. The gastropod species *Tachyrhynchus erosus* and the bivalve species *Portlandia arctica* and *Tridonta placenta* are all cold water species known to live in high arctic seas today. *T. placenta* is here considered as a distinct species, not as a variety or subspecies of *T. borealis*. These species probably migrated to Iceland from the west or northwest during the final stages of a glacial period, apparently from East Greenland. This indicates an eastward shift of the cold and oligohaline East Greenland Current to the Icelandic west coast while a weak Irminger Current could not keep it from the coast. This was probably the result of a weakened North Atlantic Current during vigorous melting of ice in the Greenland and Norwegian Seas as well as in Scandinavia and increasing input of cold low salinity and fresh water northeast and east of Iceland.

The more thermophilic gastropod species *L. littorea* and *N. lapillus* migrated to western Iceland during the following interglacial, but did not reach northern Iceland. They obviously came from the south or southeast when the warm Irminger Current along the south and west coast of Iceland was almost as strong as today and the oceanographic conditions along the Icelandic north coast were probably similar to those during the first decades of the last century, before *N. lapillus* and the bivalve species *Zirfaea crispata* reached the north coast. This indicates a strengthening of the North Atlantic Current during the initial stages of the interglacial when the heavy ice melting and deglaciation was complete.