

Thesis title: Quaternary Biostratigraphy of Kongsfjorden region, Svalbard, High Arctic

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Abstract

The impact of changes that occurred due to glacial-interglacial variability in the Late Quaternary played a pivotal role in Arctic paleoceanography and paleobiology. Extensive glaciological investigations of a series of sites along the north-western coast of Svalbard, Arctic reveal that the archipelago has been glaciated four times during the Weichselian and two during Saalian. The most extensive Late Weichselian glaciation left morphological evidence from which glacial extent, movement, and deglaciation have been well documented. Despite the low preservation potential and fragmentary record of older glaciations, due to the isostatic uplift of vast areas of marine deposits caused by glacio-eustatic lowering of sea level after the Last Glacial Maximum (LGM), these are now accessible in sections along the present-day coast of Svalbard and provide glacial-interglacial history and associated sea level fluctuations over the last 200 ka.

Foraminifera are a noteworthy group of microfossils that can be well applied to delineate past environmental and paleoceanographic conditions that existed during their ontogeny; stratigraphic correlations and reconstructions. They are vital in studying climate changes in the Quaternary. The present study aims to emphasize paleoenvironmental evaluation from foraminiferal assemblages recorded in the Kongsfjorden area (North-west Svalbard).

The work investigates the modern distribution of foraminifera in the Kongsfjorden and Krossfjorden sites; those have been used as an analog to interpret the past. The proximal region of both fjords is characterized by *Cassidulina reniforme-Elphidium clavatum* assemblage pointing out a turbid, stressed, low-oxygenated environment. The region also contains abundant asymmetric agglutinated foraminifera *Textularia* spp. and *Spiroplectammina biformis*. The central and outer parts of both fjords are characterized by *Cassidulina reniforme*, *Nonionellina labradorica*, *Lobatula lobatula*, and agglutinated species *Adercotryma glomaratum*. The shelf region, specifically at the confluence of two fjords is entirely composed of *Nonionellina labradorica* reflecting the intrusion of Atlantic water, a productive and well-oxygenated environment. In the context of productivity, Krossfjorden appears more productive than Kongsfjorden.

Sediments have been collected from the selected Quaternary units from Kongsfjordhallet, Stuphallet, and Leinstranda. The foraminifera assemblage from unit 1 of the Kongsfjordhallet section reveals *Cassidulina neoteretis -Cassidulina reniforme* assemblage pointing out a stable, cold glaciomarine environment with an occasional inflow of Atlantic water into the site during Saalian period (195±10 ka). The foraminifera assemblage from unit 4 and unit 3 from Kongsfjordhallet and Stuphallet represent *Cassidulina reniform- Lobatula lobatula -Cassidulina neoteretis* and *Cassidulina reniforme- Lobatula lobatula - Elphidium clavatum* respectively revealing the notable existence of Atlantic water in those particular sites during Eemian times (132±7 ka). They were scarce in the units of Leinstranda during the same period. The foraminifera assemblage from unit 7 and units 14/15 from Stuphallet and Leinstranda comprising *Cassidulina reniforme- Elphidium clavatum-Astronion hamadaense* and *Lobatula lobatula- Elphidium clavatum-Cassidulina reniforme* respectively reflecting abundance, and noticeable temporary warm high sea-level Phantomodden interstadial event (97±5 ka) in the sites.

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