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Dinocyst biostratigraphy of the Lower Cretaceous succession of central and southeastern Spitsbergen

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The Lower Cretaceous succession of Spitsbergen, Svalbard is divided into three lithostratigraphic units: the Rurikfjellet, Helvetiafjellet and Carolinefjellet formations. The depositional settings for the Lower Cretaceous strata ranged from shallow and open marine (the Rurikfjellet and Carolinefjellet formations) to fluvio-deltaic (the Helvetiafjellet Formation).

The main objective of the present study is to revise and improve the age control of the Lower Cretaceous clastic wedge in Svalbard which we believe will be of importance for correlation to the Barents Sea Platform and neighboring basins. For that purpose three cores (from wells Dh-1, Dh-2 and Dh-5) and two outcrop sections (Bohemanflya and Schönrockfjellet) were analyzed for dinocyst biostratigraphy. The dinocyst abundance and assemblage composition appear to be strongly influenced by changes in the depositional environment.

The Rurikfjellet Formation is dated as late Valanginian to late Hauterivian. The two most common dinocyst markers in the Rurikfjellet Formation are *Endoscrinium hauterivianum* and *Nelchinopsis kostromiensis*. In the Dh-5 well and in the Bohemanflya outcrop the uppermost sample from the Rurikfjellet Formation is questionably assigned a Barremian age, based on the presence of a questionable *Pseudoceratium anaphrissum* specimen.

Within the Helvetiafjellet Formation, the dinocyst preservation is very poor and the diversity is low. The presence of *Odontochitina nuda* and *P. anaphrissum* indicates a possible Barremian age for the formation. The topmost part of the formation is tentatively dated as early Aptian.

The base of the Carolinefjellet Formation in the Dh-2 well yields e.g. *O. nuda*, *Subtilisphaera perlucida* and *Muderongia pariata*. The dinocyst assemblage of the Dh-2 well suggests an early Aptian age for the formation, and correlates with the *Pseudoceratium nudum* Zone. In the Schönrockfjellet section in southeastern Spitsbergen the Carolinefjellet Formation is of middle Albian age and belongs to the *Rhombodella paucispina* Zone. The lower part of the succession probably represents the *Litosphaeridium arundum* Subzone, and the upper part belongs to the *Chichaouadinium vestitum* Subzone, as suggested by the common presence of *Chichaouadinium vestitum*.

The present study forms part of the LoCrA consortium project, which aims to improve the understanding of the Lower Cretaceous basin configuration and fill in the high Arctic.