



## **High-resolution ammonite-based biostratigraphy of the Adventdalen Group (Middle Jurassic – Lower Cretaceous) of Spitsbergen**

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Spitsbergen is a key region for reconstructing Middle Jurassic – Early Cretaceous geological history of the Barents Sea region, an important pathway of faunal immigration and thus crucial area for high-resolution biostratigraphic correlation within the Panboreal Superrealm. However, precise age of members and formations of the Adventdalen Group remains controversial, as well as age of the regionally traced gaps or unconformities, which correlatives are traced across the Barents Sea shelf.

Adventdalen Group in Spitsbergen is overlying the Brentskardhaugen Bed, which is containing reworked fossils of the Toarcian and Aalenian age (Ershova, Repin, 1983; Backström, Nagy, 1985).

Basal part of the Adventdalen Group is characterized by ammonite genus *Arcticoceras*, indicating Lower Bathonian *Ischmae* and Middle Bathonian *Cranoccephaloide* ammonite zones (Mitta et al., 2014). A prominent assemblage with *Keplerites svalbardensis* and *cardioceratids* above *Arcticoceras*-bearing unit is typical for the Upper Bathonian Calyx Zone.

Typical Lower Callovian ammonites are unknown in Spitsbergen. Middle Callovian is mainly represented by its uppermost part (cf. Kopik, Wierzbowski, 1986), while ammonites typical for lower part of the Middle Callovian remain unfigured (Ershova, Korchinskaya, 1980). Upper Callovian here is well-characterized by numerous records of *cardioceratids*. Although presence of Middle-Upper Oxfordian gap is widely accepted by those who studying Jurassic of Spitsbergen and adjacent areas, in fact nearly full succession of the Oxfordian ammonite zones was established for this region by Ershova (1983). In the famous Festningen section basal part of the Late Jurassic black shales (Lardyfjellet Mb) is dated by early *Amoeboceras* as *Glosense* (=Ilovaiskii) Zone. Kimmeridgian Stage in Spitsbergen is represented by full succession of Boreal zones (Rogov, 2014), and only two thin intervals are characterized by short-term appearance of Subboreal aulacostephanid ammonites (*cymodoce* and *sachsi* horizons), possibly indicating small-ranged climate oscillations.

The Volgian Stage in Spitsbergen is intensively studied during the last decades. Now nearly full succession of the Middle and Upper Volgian zones is established here (Rogov, 2010; Wierzbowski et al., 2011), while completeness of the Lower Volgian still questioned, because only its uppermost part is characterized by ammonites. It is very possible, that lower part of the Lower Volgian is absent here, as in the many other Arctic sites, being removed during the Middle Volgian transgression. Ryazanian and Valanginian Stages, well-characterized by ammonites and *buchiid* bivalves, seems to be nearly complete in Spitsbergen (Ershova, 1983). The same is true for glendonite-bearing Upper Hauterivian deposits, which are characterized by *Speetonoceras* and *Simbirskites*. However, presence of the Lower Hauterivian in Spitsbergen still not confirmed by ammonite records.

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