

Brachiopods from the Upper Ordovician Mežciems Formation from eastern Latvia

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Several deposits of marine facies zones, which vary both in composition and sedimentary environment, can be traced throughout the Baltoscandian territory. Large sections of the Ordovician in the modern day territory of Latvia change in the lateral aspect, where the north-western facies belt differs significantly from the south-eastern belt. Type section correlation is therefore a relevant issue, which can be solved by studying fossils and the subsequent correlations. The aim of this study is to determine and classify several brachiopod genera which are intrinsic to the Mežciems Formation, in order to refine, reconstruct and understand what the conditions were like, for example, sea level or depth of the paleobasin, during the aforementioned time. This study will also improve the basis on which the Mežciems Formation can be further subdivided into members, and its stratigraphic borders in Eastern Latvia.

During the Ordovician period, the position of the Baltic paleocontinent moved from around 40-50° south, to a position very close to the equator. The territory of modern day Latvia was located in the central part of the Baltic paleobasin (Hints & Harper, 2003) with land surrounding the Baltic gulf from the west, north and east. Sea levels range from deep sea to littoral zones due to several sea transgressions and regressions. The stratigraphy of the Ordovician is almost complete in Latvia – an exception being in the Valmiera-Lokno region, where there are no Ordovician deposits. In general, Ordovician deposits in Latvia are mainly carbonate, due to the warm climate conditions, but marlstones, clays, dolomites, mudstones, argillite, sandstones and siltstones are also common. In the Upper Ordovician, the most common limestone deposits are various types of micrite, wackestone, grainstone as well as oolitic limestone, biosparite and, the most important, fossiliferous limestone. During the late Ordovician it is thought that the deepest sea depths were in the western Latvia region, with shallower waters in the east (Dronov *et al.*, 2011). In western and central Latvia, upper Ordovician deposits consist of limestone, marlstone and mudstone (argillite) and clay. Conversely, upper Ordovician deposits in eastern Latvia contain limestone and marlstone layers with undulated layered marlstone interbeds (~60% of the total Ordovician section), marlstone with lenticular limestone inclusions and biomicrite/sparite, which consist mainly of remains of brachiopods, trilobites, corals and other fauna and flora (Brangulis *et al.*, 1998).

The Mežciems Formation is distributed only in eastern Latvia – its equivalents in western Latvia are the Mossen, Blīdene and Adze Formations. The Mežciems Formation spans the Haljala, Keila and Oandu regional stages. In total there are 9 drill-cores where the Mežciems Formation is confirmed (see fig. 1.). Only 5 of these drill-cores are currently being studied and the contained brachiopods classified up to the genus level. The typical deposits of the Mežciems Formation are grey, undulating layered detrital and biomorphic clayey marlstones, as well as limestone with thin metabentonite layers, with ostracod, brachiopod and chitinozoan remains (Anikejeva, 1997).

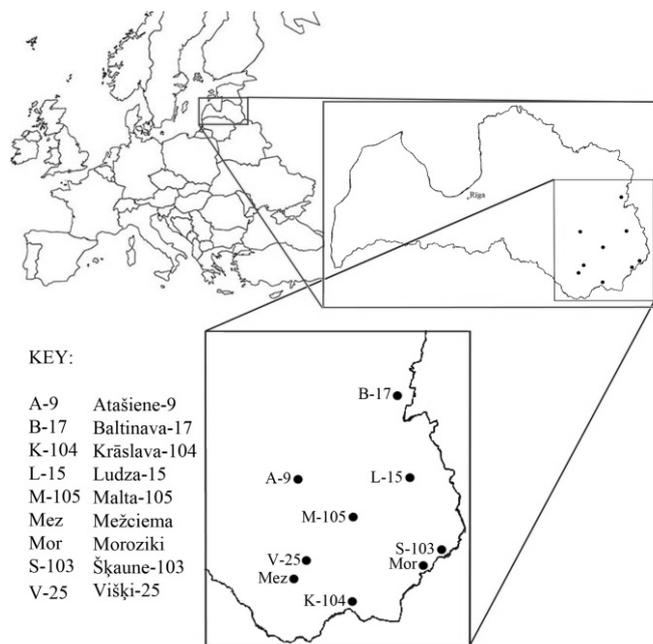


Fig. 1.: Location of drill-cores with confirmed Mežciems Formation.

Through research of papers, such as: Ulst *et al.* (1982), Paškevičius, (2000), and others, it has been determined that the following brachiopod genera are intrinsic to the Mežciems Formation and its equivalents in neighbouring countries: *Dalmanella*, *Howellites*, *Orderleyella*, *Platystrophia*, *Neoplatystrophia*, belonging to the order Orthida; *Porambonites* and *Nicolella*, order Pentamerida; *Sowerbyella*, *Longvillia* and *Leptaena* of the order Strophomenida; and finally *Vellamo*, which belongs to the order Billingsellida. Currently, the dominating genera in three of the drill-cores are *Sowerbyella*, *Dalmanella*, *Howellites*, and slightly less abundant, *Platystrophia*. A change over between the *Sowerbyella* and *Howellites* is noted in all of the drill-cores, where one genus “replaces” the other, but an unequivocal border has not yet been defined.

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