



XI Baltic Stratigraphical Conference

Abstracts and Field Guide

Edited by Olle Hints, Peep Männik and Ursula Toom



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Traces of predator attacks, post-mortem damages, and parasite activity in the vertebrate fossils from the Baltic Middle and Upper Devonian basin deposits

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The paleontological record of parasitic organisms is very incomplete, but parasite traces or parasite-induced pathologies can be found more often. However, due to difficulties in recognising and interpreting these, parasite traces as well as traces of predator attacks, diseases and post-mortem damage on vertebrate bones, are still insufficiently studied. These traces and pathologies can give an insight into predator-prey relationships and can give some information on the parasitic animals that do not have a mineralised skeleton and, for that reason, are extremely hard to study.

The Middle and Upper Devonian deposits in Latvia and Estonia are rich in vertebrate fossils that have been studied for more than 100 years. In the 1960s, the first damage traces – predator bite marks were spotted in the heterostracan armour plates and scales; however, not much attention was paid to the pathologies after that until the beginning of this century when previously described specimens together with new material were redescribed and reinterpreted in 2009 by Lebedev, Mark-Kurik, Lukševičs and Ivanov.

A thorough examination of the fossil vertebrate material from the Middle and Upper Devonian deposits of Estonia and Latvia that is stored at the University of Tartu and Tallinn University of Technology (where the previously published material is also stored) and the Museum of the University of Latvia was carried out. New excavations in the Upper Devonian localities in Latvia from 2016 to 2023 have provided additional fossil vertebrate material that has also been studied.

Predator-caused pathologies – bite marks, deformations, fractures and torn-off plate or scale corners accompanied by regenerated tissue can be seen in the remains of almost all fishes, including predators – antiarchs, arthrodiroids, heterostracans and sarcopterygians, starting from the Givetian to the latest Famennian deposits. In placoderms, these are not always easy to distinguish. In some cases, there are no signs of healing due to a successful attack or scavenger activity.

The presumably parasite-induced pathologies include attachment pits that are usually found on the bones of sarcopterygians from Gauja to Ketleri Time. Traces of a migratory parasite or even a drilling scavenger - small boreholes sometimes accompanied by lesions of non-specific shape have been found in various species of *Asterolepis* from Burtneki, Gauja and Amata Formation deposits, species of *Bothriolepis* and sarcopterygians from the Tērvete and Ketleri formations but are uncommon in other placoderms or heterostracans which generally do not display any other pathologies apart from bite marks. Swellings and pathological bone regrowth (bony lesions) without a clear cause have been identified in both Late Famennian placoderms and sarcopterygians, and post-mortem bone bioerosion of Frasnian and Famennian age have been documented.

Keywords: Baltic Devonian basin, vertebrates, pathologies, bite marks, parasite traces.