

Crystals on the rocks. Apatite overgrowth on conodont elements from the late Ordovician of Normandy, France

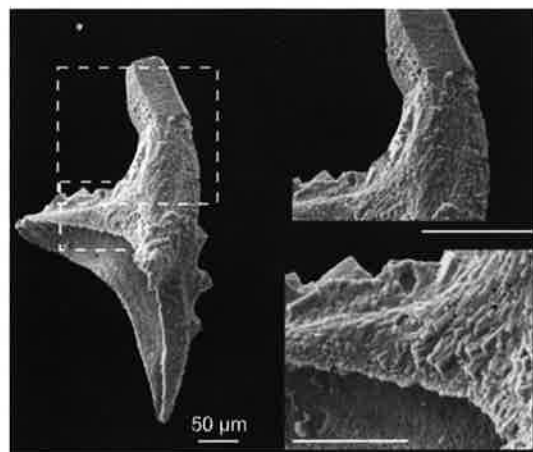
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New conodont collections from the Vaux Limestone exposed in Normandy at its classical locality at Saint-Hilaire-la-Gérard have been recently described and referred to the middle Katian-lower Hirnantian *A. ordovicicus* Zone (Ferretti et al., 2014). The abundant and low diversity fauna is closely similar to coeval faunas from other parts of continental Europe, and documents the *Sagittodontina robusta-Scabbardella altipes* biofacies of the Mediterranean Province. The conodont specimens exhibit a CAI (Colour Alteration Index) of 4-5, indicating a heating of 300-400 °C. Under the stereo microscope, elements are moderately well-preserved. Peculiar apatite overgrowths on the oral surface of the conodont elements were revealed by detailed SEM investigation. Three types of microtexture (“large columnar”, “blocky”, and “web-like”) are present. The large columnar crystal microtexture consists of long prismatic sub-isometric apatite crystals up to 20 µm long, approximately aligned with the element main axis. A single larger crystal may fully replace the cusp. The blocky microtexture is made by up to 10 µm isometric crystals lacking a definite habit and developed close to the basal cavity and along the element margins. The blocky crystals are often unaligned, although they appear normal to the conodont surface on nodes and margins of the element. The web-like microtexture consists of tiny crystals arranged in circular rims, often bordering areas with no visible crystal pattern. The three types of crystal microtexture may develop in different areas of the same element or be exclusive of a single conodont specimen.



X-ray microdiffraction was used to characterize various points of the surface of the conodont specimens. XRD spectra were powder-like spectra: a polycrystalline-like structure and no single crystal was found on the surface of some coniform elements (*Scabbardella altipes*). Unit cell parameters were calculated according to the hexagonal symmetry of apatite. These measurements allowed to highlight the existence of a clear pattern of preferred orientations. The presence of different preferred orientations was confirmed by ramiform elements (*Amorphognathus*). These specimens showed the presence of single crystals of apatite over the polycrystalline apatites of the underlying surfaces: calculation of the unit cell parameters highlighted no significant differences between these two different forms of apatite.

Reference:

Ferretti, A., Messori, A., Bergström, S.M. 2014. Composition and significance of the Katian (Upper Ordovician) conodont fauna of the Vaux Limestone (“Calcaire des Vaux”) in Normandy, France. *Estonian Journal of Earth Sciences* 63(4), 214–219, doi: 10.3176/earth.2014.21.



**International Geoscience Programme
Project 591 - Closing Meeting
‘The Early to Mid Palaeozoic Revolution’
Ghent University
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Closing Meeting ABSTRACTS



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Abstracts

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