

What Is the Orsten and its Faunas?

The **Orsten** is limestone rock from the lower Cambrian to the earliest Ordovician, i.e. ca. 520 to 490 Million years old, in the form of nodules embedded in finely layered alum slates, alunskiffer) or layered limestones. By etching the calcite away, minute animals were discovered in the residues on sieves (see methods). The phosphatic matter had preserved the surface of the fossils in such a fine way that they were fossilized as not-compressed three-dimensional carcasses, which all details of their surface still present. Most of the fossils are hollow, accordingly, but in rarer cases, the body is filled, partly or entirely, = solid (smore soon).

In the case of arthropod fossils, this means that their cuticle is preserved including all surface details, such appendages or eyes. But also surface details such as hairs, membrane folds or pores, which is due to the preservation of the top layer, the epicuticle. Shrinkage often had distorted the animals, some specimens are even blown up, but, remarkably, the tiny crustacean larvae – only 100 micrometer long – are the best preserved and often completely undistorted. Breakage during the processing, from etching, to sieving and sorting to imaging under SEM are in our view the major factors of damage to loss.

Initial sites in southern Sweden were discovered in 1975 by the late Klaus Müller, Professor at the University of Bonn, Germany, notably around the hillside Kinnekulle, in the region Falbygden and on the island of Öland, all in Sweden. Successively similar fossils were discovered on world-wide scale, i.e. on all of the micro-continents which existed at that time around the giant continent Gondwana.



Orsten nodule whole and cut (dot = 5 mm)



The surrounding alum shales, here in a quarry in Skåne, Sweden, are a finely layered compaction series of up to 100 m – mostly much less – of bituminous slates.