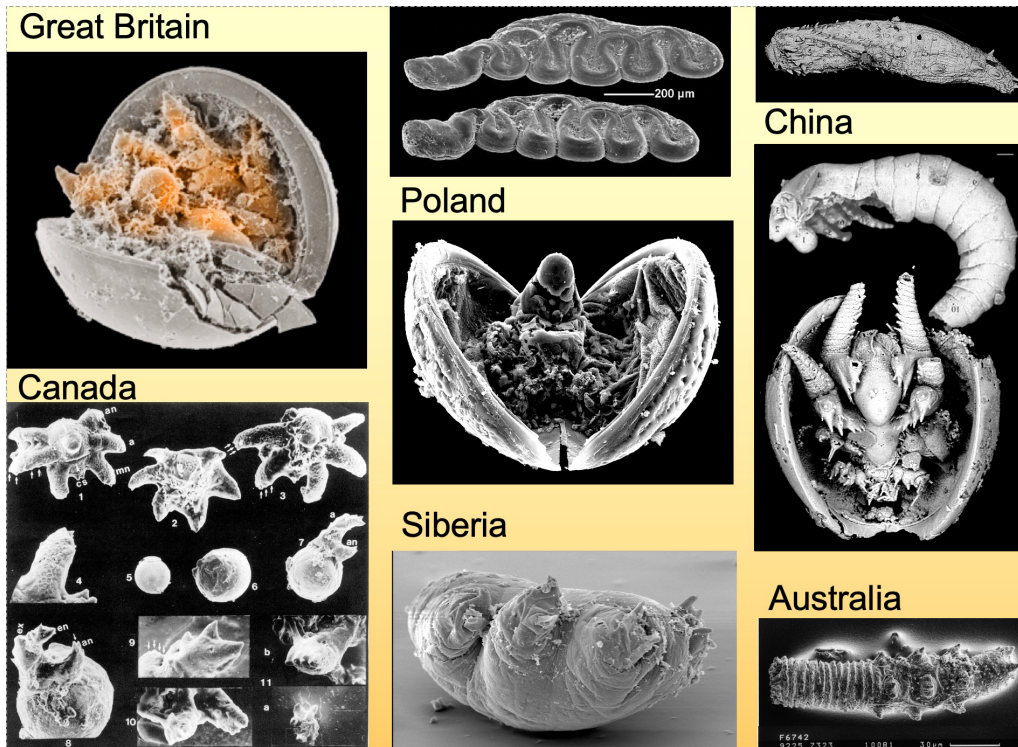


Introduction

Scientific work on the 490 – 500 Million years old 'Orsten' fossils can serve as an example of fruitful alliance between Biology and Palaeontology, not least in order to improve our understanding of Metazoan evolution in general. In fact, 'Orsten' fossils, now known from all around the World, have provided us with a unique window into life at the sea bottom as early as in the Cambrian – and even in a three-dimensional view.



Orsten fossils from around the world; more pictures, e.g., in our gallery of 'Orsten' animals

The international C.O.R.E. Group and its research activities

In 2005 a group of researchers, C.O.R.E. group, was founded as an informal international science alliance with a common interest in the exceptionally 3D preserved 'Orsten' fossils from the earliest period of the "Zoicum" (time of animal evidence), the Cambrian (ranging from 542 to 490 Million years before date). Until 2015 the number of members increased to around 40 from no less than 8 countries from 4 continents and Japan. The group consisted of the workgroup around Dieter Waloszek at the University of Ulm, several other workgroups such as in the UK and in Sweden, and single researchers. Study objects of C.O.R.E. were and still are in the main the 'Orsten' fossils, but also broader aspects of palaeobiology (from pale-environment and habitual aspects to all aspects of morphology, ontogeny [development] and functional morphology, to interrelationships and phylogeny or evolution in general), taphonomy and geology in general. One issue of the international research alliance was the concentration of expertise about the 'Orsten' and its fossils, 'Orsten' sites in which these occur, related topics, and, last but not least, the dissemination of information on the 'Orsten' as one of the most informative and significant early Palaeozoic lagerstaetten.

To serve these purposes, a website ' was created with simple tools, but with as much information as we could accumulate – corrected and updated as regular as possible. This C.O.R.E. 'Orsten'-Research website was particularly built to present information about the 'Orsten' in geological terms and its fossils – mainly animals. Besides this, it tried to provide background data on the history of 'Orsten' research (from the founder to the activities today), methods – and also relevant literature around the 'Orsten' and aspects of exceptional preservation. We also started to present our first thoughts about more general aspects of the morphology, phylogeny and evolution of the animals, Metazoa. The literature list included links to download underlying PDFs, but at that early time we ran out of webspace very soon. Updating was another problem.

The new approach shall overcome this, but the majority of papers (particularly from Dieter Waloszek) can be obtained or requested via the website of RESEARCH GATE. Therefore you are invited to select and download papers from this valuable source. Since the papers of the late Klaus J. Müller are more difficult to

obtain, these are listed here and can be requested from us via email. With regard to the new 'Orsten' website, we do hope to update it further, correct and re-incorporate more data, and more information on 'Orsten' occurrences from other sites, from the Furongian of Poland and particularly from lower to late Cambrian of China. These yielded not only the hitherto oldest fossils in this type of preservation, but also uncovered the largest specimens, now in the cm range. And the China finds yielded another cuticle-bearing animal group in Orsten preservation, known until then only from Australia and from fossil in 2D = flat preservation, nemathelminths. Particularly these discoveries have contributed not only significantly to our knowledge about and around the 'Orsten' by adding different species, but they also added to our knowledge about lithological, preservational, taphonomical and taxonomical issues. The fossils from the new localities in China and new investigations of old and new material from Europe provided us with significantly new data on the evolution of animal groups and helped to improve and widen our evolutionary interpretations significantly. We also have to add information on the different localities in Newfoundland, the UK, Poland, Siberia, and Australia – and of course, new methods applied in the Post-Müller time.

Alltogether, the 'Orsten' is the longest-ranging type of conservat lagerstaetten, clearly outranging Chengjiang from China – only early to Middle Cambrian – and Burgess Shale – only early to Middle Cambrian – by far: 'Orsten' fossils are now known from the early Cambrian to the latest Cambrian, Furongian, possibly extending even into the lower Ordovician! Indeed, the C.O.R.E. activities have continued, the latest articles so far are from the period between 2019 and 2023, more under construction. One of the papers depicts finds of larval phosphatocopine crustaceans from Poland (Olempska et al. 2019), another describes for the first time faecal pellets from the Orsten, among the complicated faecal products ever (Olempska et al. 2023). so we do hope that Orsten Research goes on.