Still shellfish after 425 million years: clam-like creature preserved perfectly in ancient fossil

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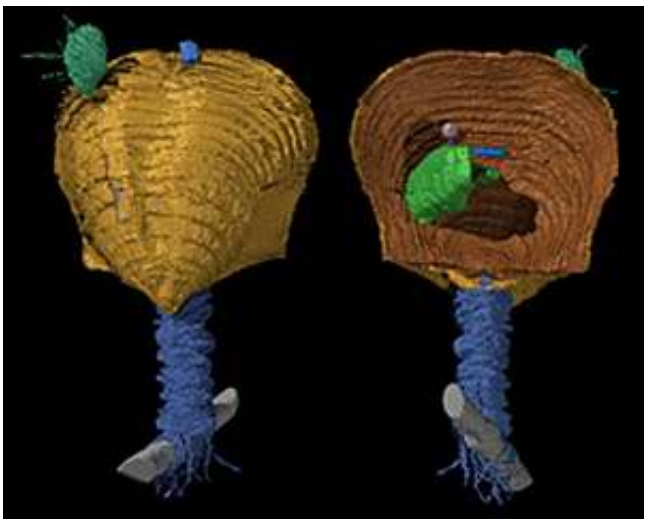

An ancient shellfish not seen for 425 million years is recreated in vivid 3D images published today, following a unique fossil find in the UK.

The 'articulate brachiopod' fossil, found in a quarry in Herefordshire, England, is the first of its kind to be preserved with its soft parts intact in 3D. It was discovered by Dr Mark Sutton of Imperial College London, who reveals the structure of the clam-like organism using a 3D colour computer model in this week's Nature.

Showing the internal structure of the brachiopod as well as the stalk and rootlets that kept it tethered in place, the model gives a unique insight into the workings of the ancient shellfish.

Dr Mark Sutton, a lecturer in the Department of Earth Science and Engineering, who discovered the fossil alongside colleagues at the Universities of Yale, Oxford and Leicester, said: "This is a significant discovery because it is something we never dared to dream we might see - an ancient fossil articulate brachiopod with its fleshy parts intact, and preserved in three-dimensions to boot.

"Up to now, in all the millions of articulate brachiopod fossils scientists have examined, no-one has ever found anything except empty shells. This fossil helps us understand one of the most common creatures to have lived in the ancient oceans of the world," adds Dr Sutton, who gave the fossil the Latin name Bethia serraticulma after his wife Bethia.

The find has challenged the assumption that ancient brachiopods were put together in the same way as their modern descendents. The ancient model is unusual because its rootlets are physically tied onto a stick-like object on the sea-floor, most likely to be debris from a dead sea-lily. Some modern brachiopods have rootlets, but they spread out into soft sediment, just as plant roots do.

"Those brachiopods that stick to a hard object do it chemically, rather than tying themselves on," explains Dr Sutton. "Bethia's stalk is also much chunkier than in any modern brachiopod, and has strange ridges on it. It clearly didn't work in the same way at all. You can also see baby brachiopods attached with their stalks and the main fossil has filaments of its feeding organ," he adds.

This fossil is the latest in a series of spectacularly well-preserved creatures from the Herefordshire site that Sutton and his colleagues have

unearthed over the last few years. The team anticipates that many more important finds are yet to emerge.

The model was created by shaving away the rock encasing the fossil layer by layer. Scientists then photographed each layer, reducing the fossil to dust, but converting it into a high-fidelity 3D 'virtual fossil' that can be viewed and manipulated on computer.

Source: Imperial College London