Glowing fossils: Fluorescence reveals color patterns of earliest scallops

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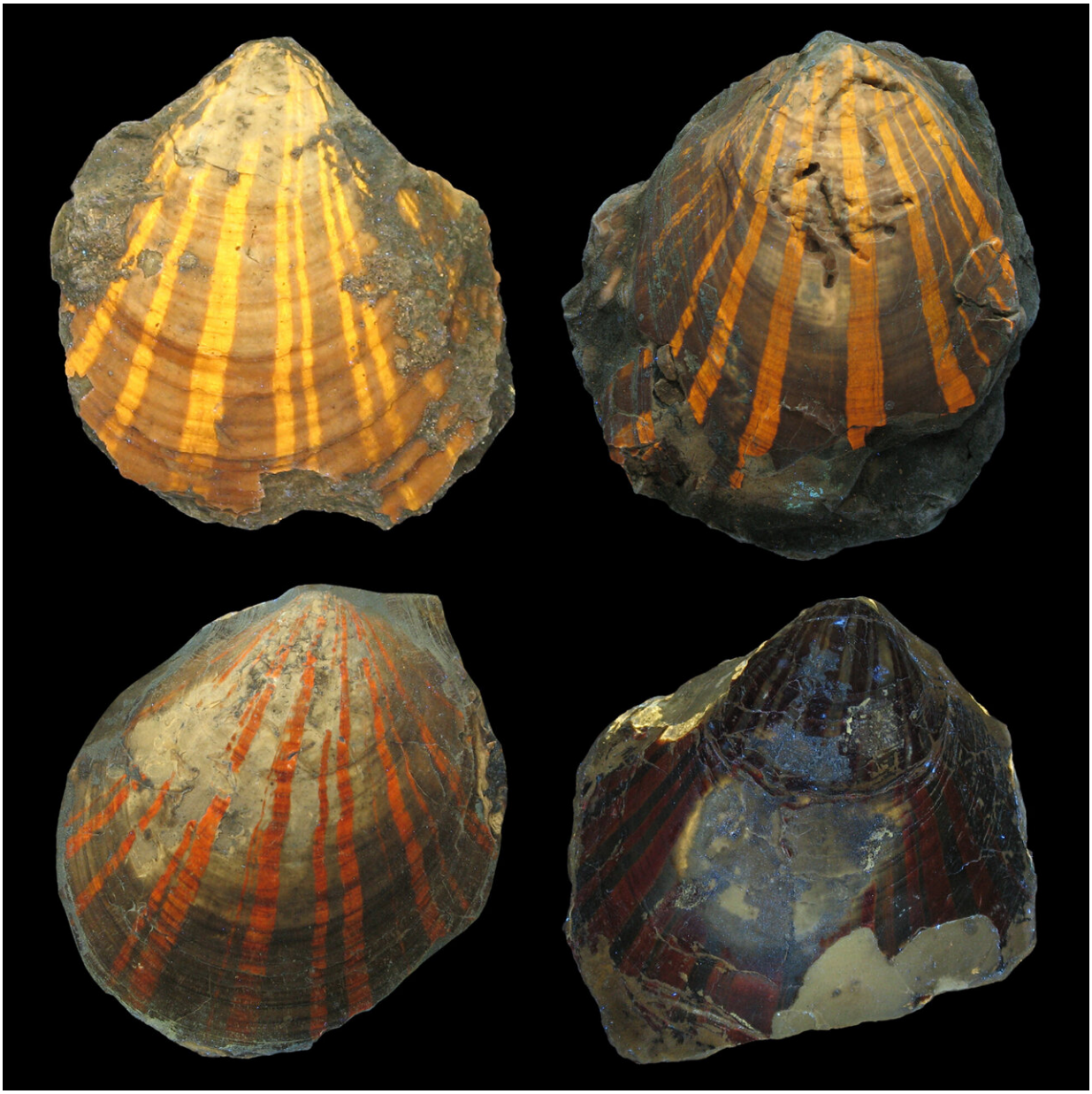

Different fluorescent colours in the fossil scallop Pleuronectites. Credit: University of Göttingen/Klaus Wolkenstein

UV light makes it possible to see intricate structures of fossils that are barely visible in normal daylight. This method has often been used on the fossilized seashells from the Earth's current geological era to reveal patterns of color that had long since faded away.

Now, research by a scientist from the University of Göttingen shows that fluorescent color patterns can even be found in shells that are around 240 million years old, from the Earth's Mesozoic Era. This makes them the oldest fluorescent color patterns found so far. The results of this study have been published in the journal *Palaeontology*.

In fossils from the Mesozoic Era, traces of color patterns are very rarely observed. However, the investigation with UV light of scallops from the Triassic period—right from the beginning of the Mesozoic Era—shows that color patterns are preserved much more frequently than previously thought.

UV light, which is invisible to the human eye, excites organic compounds in the fossils causing them to glow. This reveals a surprising variety of color patterns: different variations of stripes, zigzags and flame patterns. The diversity of color patterns is similar to those of today's seashells found on a beach.

However, the color patterns of today's scallops do not show any fluorescence. "In the case of the Triassic shells, fluorescent compounds were only formed in the course of fossilization through oxidation of the original pigments," explains Dr. Klaus Wolkenstein from the Geosciences Center at the University of Göttingen, who is currently

carrying out research at the University of Bonn.

Surprisingly, the fossil shells show different fluorescent colors, depending on the region where they were found. "The color spectrum ranges from yellow to red with all the transitions in between, which suggests that there were clear regional differences in the fossilization of these scallops," adds Wolkenstein.

More information: Klaus Wolkenstein et al, Fluorescent colour patterns in the basal pectinid Pleuronectites from the Middle Triassic of Central Europe: origin, fate and taxonomic implications of fluorescence, *Palaeontology* (2022). DOI: 10.1111/pala.12625

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