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Speleothem deformation due to the 2017 M_w 6.6 Bodrum–Kos earthquake in a cave on Pserimos (Dodecanese, Greece)

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Although damaged speleothems have been widely investigated to study paleo-earthquake records in caves, only few reports could directly link damages to specific recent earthquakes. We mapped before the 2017 M_w 6.6 Bodrum–Kos earthquake the so-far unexplored Korakia Cave on Pserimos island in the Dodecanese (Greece), which is located at the transition between the Aegean and Anatolian region and is known for its strong seismicity. The cave formed along an active normal fault and records numerous broken columns and flowstones sealed by younger speleothems. New $^{230}\text{Th}/\text{U}$ -ages show that paleoseismic events occurred since the formation of the cave, which is older than the limit of the dating method. During a cave visit 2 months after the 2017 M_w 6.6 Bodrum–Kos earthquake we noted that c. 10 cm small stalactites, which were actively growing along fractures in the cave ceiling, have been chipped off by movements along the fractures and were lying on flowstones covered by greenish biofilms. Removal of the broken fragments demonstrated that the chlorophyll pigment below the position of the fragments did not show a colour difference to the surrounding area, which is exposed to the daylight of the cave entrance. The preservation of the photoautotrophic biofilm, which can survive only a few months without daylight, suggests that the stalactites have been broken by the 2017 M_w 6.6 Bodrum–Kos earthquake, which also caused the collapse of several buildings on the island of Kos only 4 km S of Pserimos. We conclude that earthquake capable of causing small shear displacements on fractures can damage speleothems. However, other delicate speleothems including long and slim stalactites remained undamaged.