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Stable isotope sclerochronology of Pleistocene shells of Tridacna from Abu Dhabi (UAE)

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Shells of Tridacna costata Roa-Quiaoit, Kochzius, Jantzen, Zibdah, Richter, 2008, were recently identified from the shallow subtidal zone (up to 10 m deep) off the coastline of Abu Dhabi, on the southern shore of the Arabian Gulf. There are no previous records of this species from the Arabian Gulf although it has been relatively widely reported from Pleistocene deposits of the Red Sea. The shells are in a good state of preservation with little evidence of post mortem degradation or diagenesis. Radiocarbon dating of four separate shells gave an age of >50,000 years. Consequently, these molluscs predate the last glacial maximum and date from a previous flooding episode in the Arabian Gulf, most likely the last interglacial eustatic sea level high at 120 ka.

We studied the oxygen and carbon isotopic composition in sclerochronological transects of two shells, one with three, the other with 14 annual growth increments. The thickness of growth increments is 5 -7 mm, and 10 to 23 samples were obtained from each growth increment. The isotopic composition is compared with modern skeletal aragonite to constrain salinity and temperature of Pleistocene seawater of the Arabian Gulf, and annual variations of these parameters.