Nullarbor rafts and their paleo-environmental significance

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Studies of modern rafts were carried out in order to allow conclusions to be drawn as to the depositional environment of two sets of rafts found in flooded cave passages beneath the Nullarbor Plain. In Warbla Cave, South Australia, a cone of rafts has been located at a site that at present has no air space. In Tommy Grahams Cave, West Australia rafts were found in a speleothem core taken from 24-m depth in a now flooded section. In the core there are several centimeters of compacted rafts found below massive calcite dated at 85,000 BP.

Rafts from the Orient pool at Jenolan Caves, New South Wales were regarded as being typical of a freshwater deposition and rafts from Nurina Cave, Roe Plains, West Australia as rafts depositing on surface of saline water. In both caves, clusters of crystals float on the surface of deep still pools. The depositional environment of the crystal rafts will be described and it will be illustrated that rafts can be both ephemeral and permanent. Rafts have been sampled from both sites and their crystal morphology and growth patterns established by scanning electron microscopy. Chemical analyses and calculated saturation indices show that rafts grow on mineral saturated waters that vary from fresh to hyper-saline.

The minerals in all rafts have been identified using Raman Spectroscopy and the constituent elements have been mapped using energy dispersive spectroscopy. The rusults from these studies will be presented and preliminary re-constructions of the paleo-environments caused raft deposition in the two flooded caves.