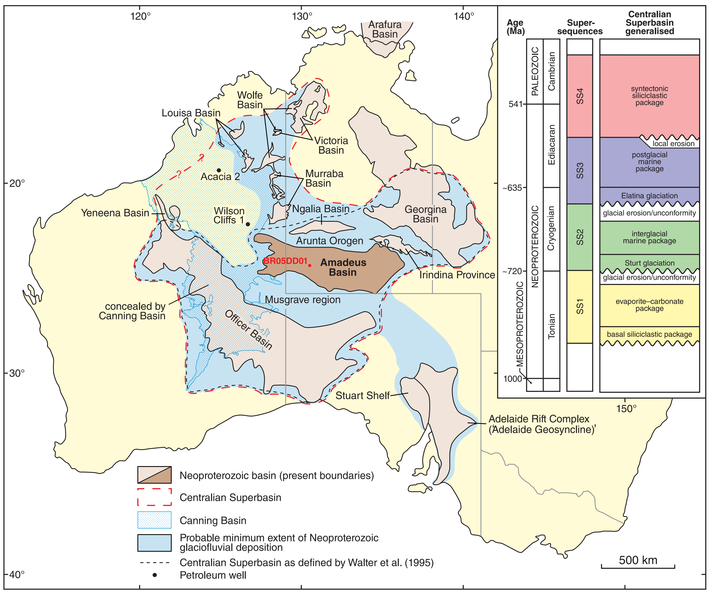
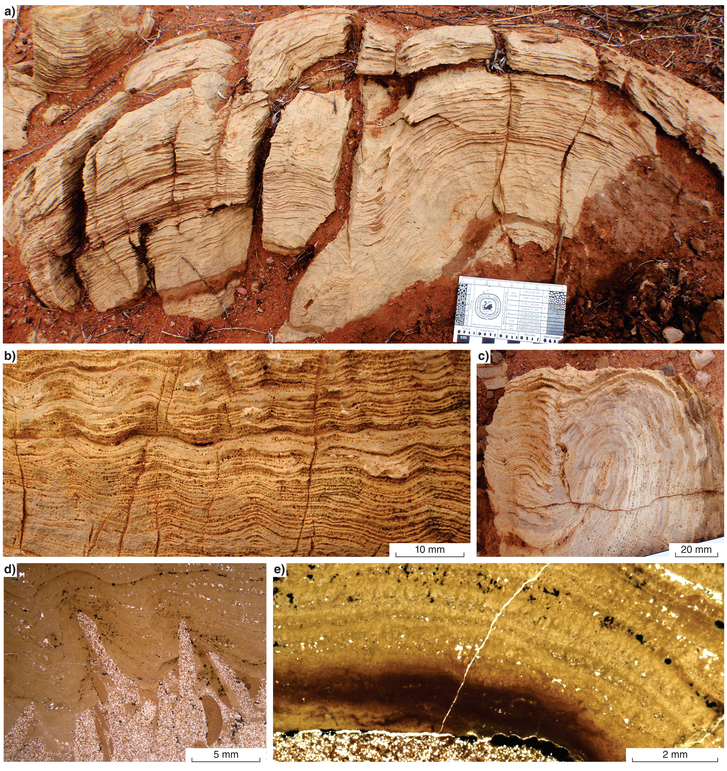
# AMADEUS BASIN

## Biostratigraphic review of the Cryogenian Aralka Formation

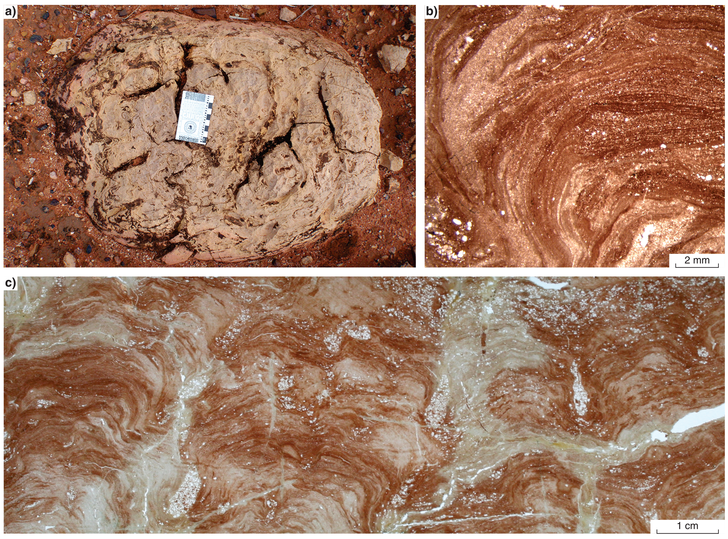
The Cryogenian Aralka Formation, deposited during the interglacial period flanked by the Sturt and Elatina glaciations, is a unique interval for the Earth's biosphere. The formation is predominantly recessive siltstone but includes minor stromatolitic carbonate. It has been included in recent revisions of Neoproterozoic–Cambrian stratigraphy and is now recognised across much of the Amadeus Basin. The discovery of new outcrop and drillhole intersections prompted systematic revision of stromatolites in the Aralka Formation and analysis of their distribution.

A distinct stromatolite assemblage, characterised by the presence of *Tungussia inna* and *Atilanya fennensis*, has been recognised from outcrop and drillhole intersections across the Amadeus Basin. The assemblage also contains other stromatolites, not yet systematically described, that are similar to stromatolites in the Cryogenian Umberatana Group of the Adelaide Rift Complex.



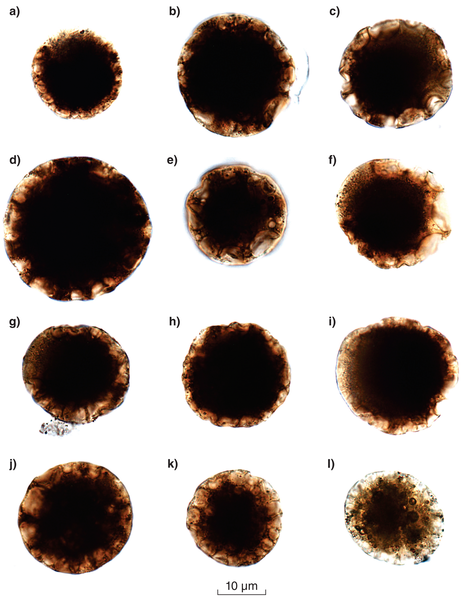




*Atilanya fennensis* Allen, Grey and Haines 2016 (left and below): **a)** typical bioherm at the type locality; **b)** diagnostic wrinkled lamination, a manifestation of the underlying pillared microstructure (see d–e); **c)** nucleation intraclasts are common; **d)** laminae encrust intraclasts and drape down the sides of the clast at the microscale; **e)** microstructure showing the banding into light and dark laminae. Detail within the light laminae reveal micropillars, one of the diagnostic features of this stromatolite

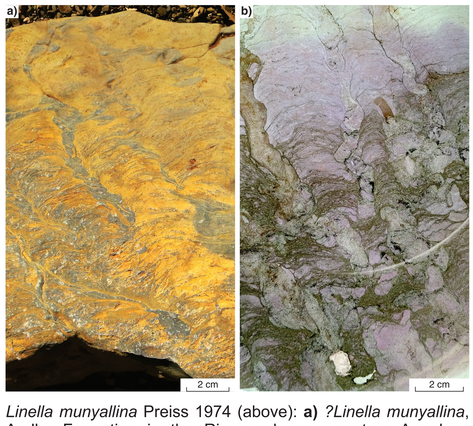



*Tungussia inna* Walter 1972 (above) from the Boord Ridges western Amadeus Basin: **a)** bioherm in plan view displaying typical pink colouration of *T. inna*, at this location; **b,c)** typical microstructure of *T. inna* incontinuous banded lamination with commonly incorporated clastic material

The interglacial Aralka Formation is commonly barren of organic-walled microfossils, but a new species, *Vandalosphaeridium* sp. nov., has been documented from Northern Territory Geological Survey stratigraphic drillhole BR05DD01. The species is abundant in a single sample and, combined with stromatolite data, could prove to be a valuable stratigraphic marker if encountered elsewhere in the basin.




*Vandalosphaeridium* sp. nov. (above), from BR05DD01, 155.28 m, Aralka Formation




*Linella munyallina* Preiss 1974 (above): **a)** *?Linella munyallina*, Aralka Formation in the Ringwood area, eastern Amadeus Basin, branches with bumpy margins and highly variable laminae; **b)** showing comparison with S471, Adelaide University Collection, *Linella munyallina* holotype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AUGUST 2019