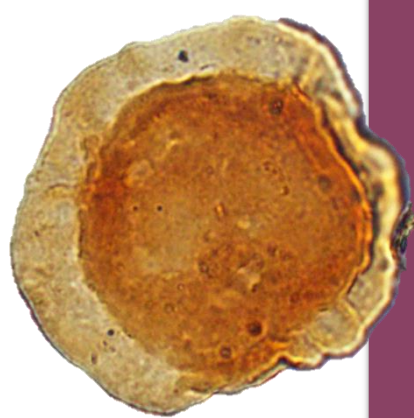


Palynology of the Jurassic – Cretaceous transition, Surat Basin

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Callialasporites dampieri



Cyathidites australis

Project overview

The Gubberamunda Sandstone and Orallo Formation are the last two formations from the Surat Basin to undergo detailed palynological study having fallen between the major projects last century of the Geological Survey of Queensland and Geoscience Australia. This project will bridge the gap (Figure 2) and

- Identify and describe the palynomorphs of the section and plot their stratigraphic distribution and assess changes over time
- Test the existing pan-Australian palynostratigraphic schemes shown in Figure 2 against the data and determine how useful they are in the Surat Basin
- Learn as much as possible about the paleoclimate and paleoflora of the time.

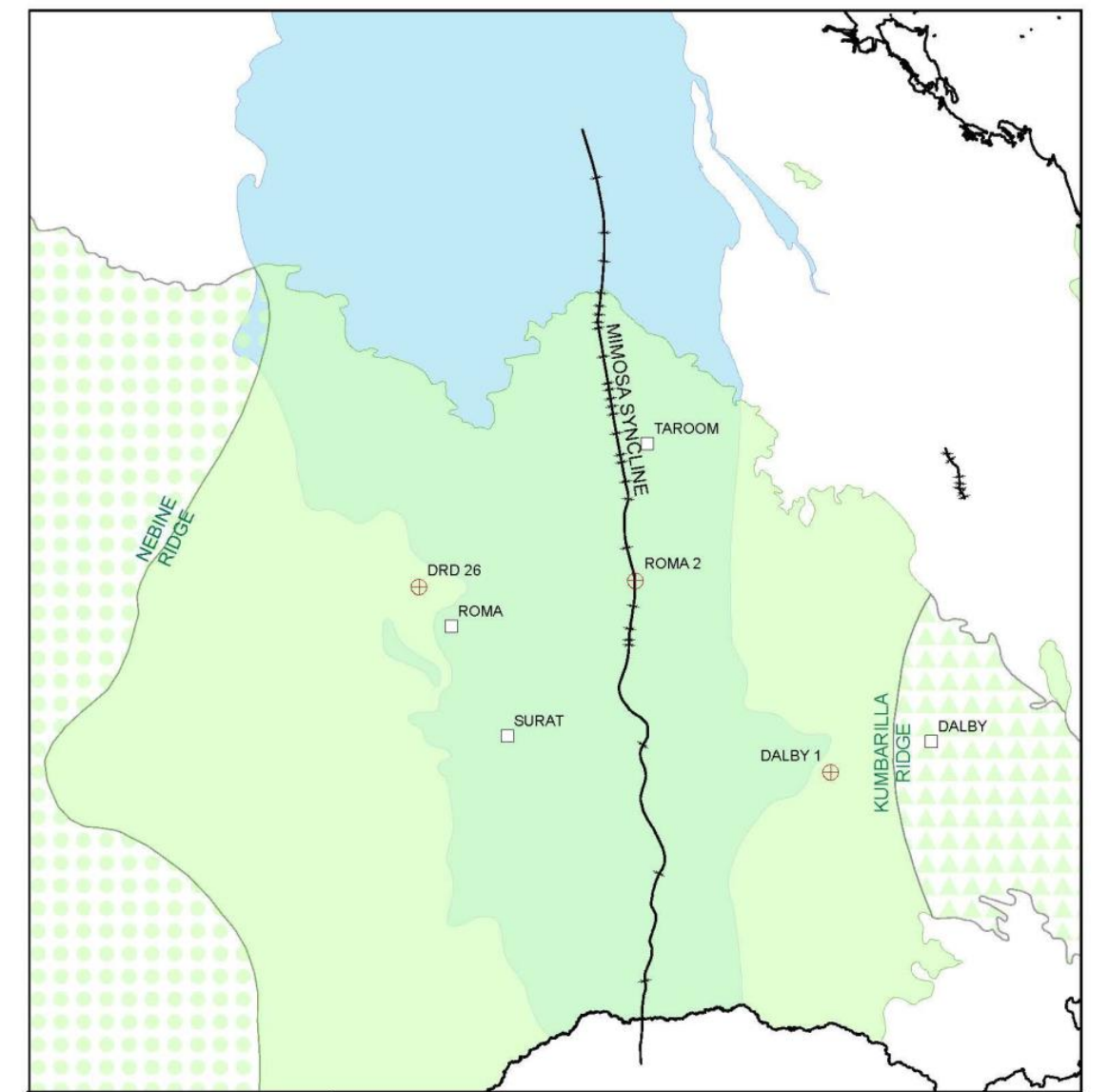


Figure 1: Map showing the locations of the 3 GSQ stratigraphic holes sampled with the Surat Basin in green

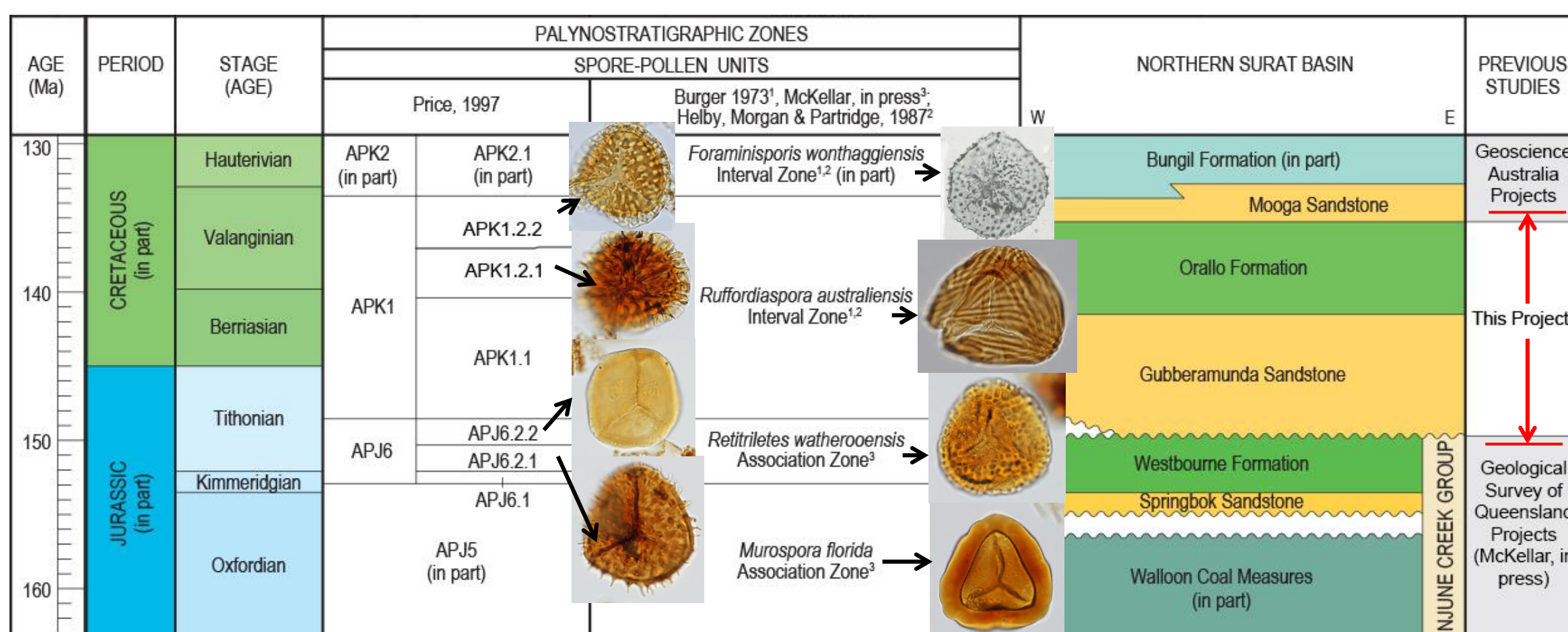
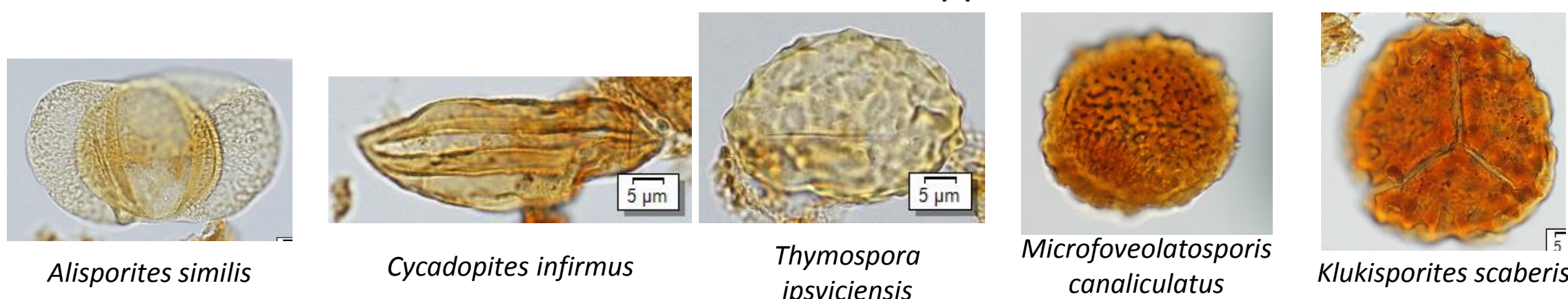


Figure 2: Late Jurassic–Early Cretaceous lithostratigraphy and biostratigraphy. Right hand column shows overlap of the current project and the two earlier Surat Basin projects. Photos are linked to the biozones that their first appearance defines.



Alisporites similis

Cycadopites infirmus

Thymospora ipsviciensis

Microfoveolatosporis canaliculatus

Klukisporites scaberis

Importance

- The Gubberamunda and Mooga Sandstones are regionally significant aquifers.
- The Surat section here represents the most complete record of deposition in Queensland for the Tithonian–Valanginian and so will provide a reference point for less complete, nearby basins.
- Being able to confirm one of Price's subdivisions of the *Ruffordiaspora australiensis* Interval Zone or producing a new one would make differentiating the formations in core and outcrop more reliable.

Some findings so far

- The number of different palynomorphs seen (over 150 already described species with many possible new ones or variants across 108 genera) indicate that this was a very floristically diverse period.
- Based on reworking of palynomorphs the sediments feeding into the Surat were periodically being sourced from sedimentary Permian aged rocks.
- While counts have not yet been performed it appears that the zones of Price as shown in Figure 2 are not correctly aligned to the lithostratigraphy and that some of them may not work at all in the Surat Basin.
- The make up of the palynofloras suggest that the Surat Basin climate at this time was some form of a temperate one.

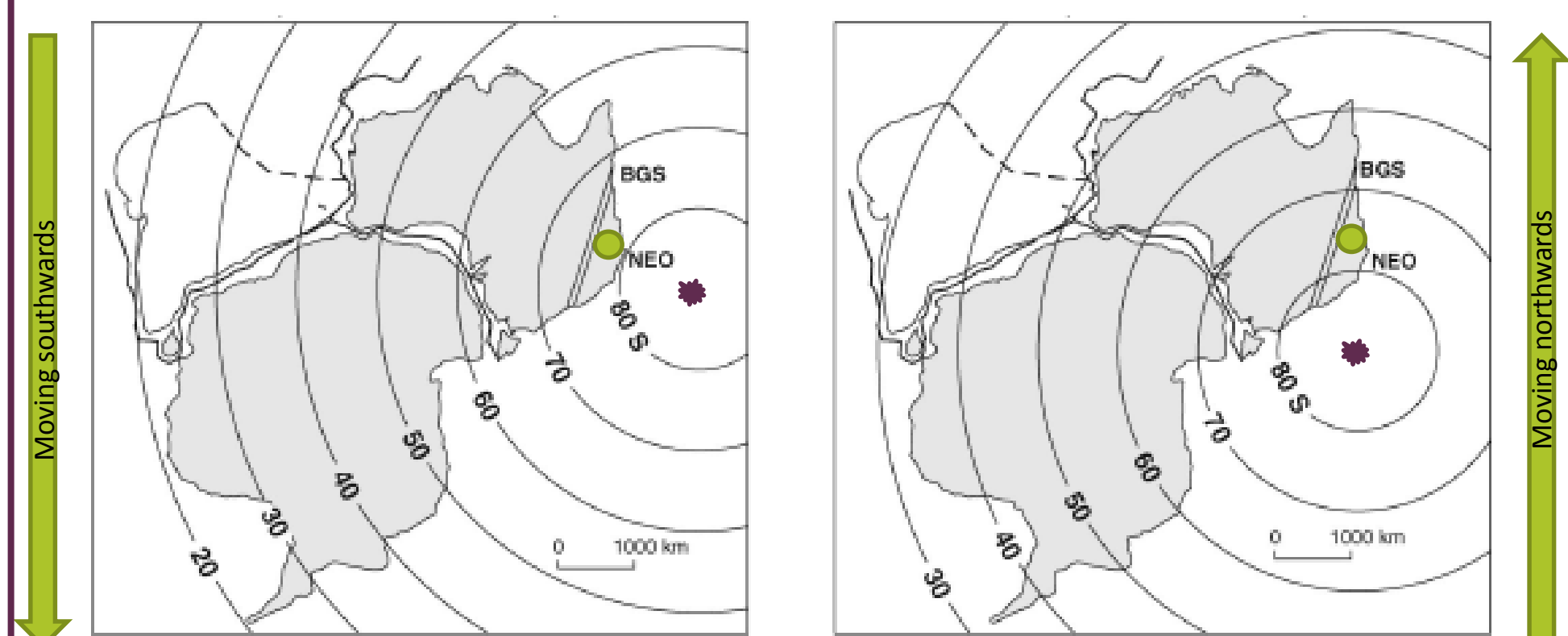


Figure 3: Paleoreconstructions showing the proposed locations of the Surat Basin (green) and the south pole (purple) taken from Klootwijk, 2009. Late Jurassic on the left and Early Cretaceous on the right.

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Reference

Klootwijk C. 2009. Sedimentary basins of eastern Australia: paleomagnetic constraints on geodynamic evolution in a global context. *Australian Journal of Earth Sciences*. 56:273–308.