



**A PALAEOENVIRONMENTAL ANALYSIS OF
THE OSTRACOD FAUNA OF THE EARLY
MIDDLE MIOCENE MORGAN LIMESTONE
AND CADELL MARL, MURRAY BASIN,
SOUTH AUSTRALIA.**

B. J. McHenry B.Sc (Hons).



The University of Adelaide
The Department of Geology and Geophysics

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ABSTRACT

A stratigraphic section through the Early Middle Miocene (Batesfordian) Morgan Limestone and Cadell Marl was measured and sampled at regular intervals and these were picked for Ostracoda. Examination of familial variations through the section and a cluster analysis which discriminates 7 discernible ostracod assemblages has been used to reconstruct the depositional history of the sequence.

These ostracod assemblages appear to reflect a change from inner shelf onshore conditions to inner shelf offshore conditions through the lower Morgan Limestone, deepening to middle shelf depths low in the Cadell Marl. Conditions shallow from the middle of the marl to the top of this unit, this signal being overprinted by fluctuating nutrient conditions producing an alternation of *Maoricolpus* beds and marls. The upper limestone member was deposited on the inner shelf under oscillating nutrient levels.

Foraminiferal dating of the section places the deposition of the Morgan Limestone/Cadell Marl sequence during a time of rising and falling sealevel peaking at the highstand of cycle 2.3 in the Batesfordian stage. This appears to correlate well with the suggested highstand in the lower Cadell Marl (assemblage Cadell 1).

Milankovitch order fluctuations in sea level overprinting the third order Miocene oscillation and associated Batesfordian highstand have produced a cyclicity of lithology from meso-oligotrophic *Celleporaria* limestones to highly eutrophic *Maoricolpus* marls and limestones, with each of these depth/lithology/nutrient associations characterised by a distinctive ostracod assemblage.

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