

**Mid-Cretaceous development of the Eromanga Basin, Queensland, Australia;  
palaeoenvironmental and palaeobiogeographic context  
for newly discovered fossil assemblages**

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The Winton Formation of central Queensland is recognized as a primary sedimentary repository for mid-Cretaceous terrestrial faunas and floras in Australia. However, investigations linking fossil assemblages and contextualizing palaeogeographic and palaeoenvironmental relationships across the Eromanga basin remain limited. Therefore, this study employed a multifaceted approach to better understand the cryptic tectonic setting, palaeogeography and palaeoenvironmental of eastern Australia during the late Mesozoic. Further focus was to interpret the depositional environments and improve stratigraphic correlations between multiple newly discovered fossil localities within the preserved Winton Formation in the Eromanga Basin, including Isisford, Lark Quarry Conservation Park, and Bladensburg National Park. Initial work included U-Pb geochronology and Lu-Hf isotope analysis of detrital zircons recovered from the mid-Cretaceous Winton and Mackunda Formations. Cretaceous-age zircon populations dominate the provenance record and indicate that deposition was largely synchronous with ongoing volcanism to the east (TUCKER et al., 2016). Lu-Hf isotopic data suggest that these zircon populations were sourced from igneous rocks of a mixed juvenile and crustal source, similar to Lu-Hf isotopic systematics for older terranes, which lie within eastern Australian. Results from this study support the hypothesis that the Whitsunday igneous association was the main source of Cretaceous sediment to the Eromanga Basin, and likely for sediment transported across the continent southward and into the Ceduna Delta system offshore South Australia.

Palaeoenvironmental reconstruction included the identification of twenty-three facies types and nine repeated facies associations. This study identified a mosaic of marginal marine to inland continental alluvial depo-centres. These developed synchronously with the final regression of the Eromanga Seaway from central Australia during the early Turonian. This work further demonstrates that the Isisford fauna is part of the lower member of the preserved Winton Formation; whereas, fossil localities around Winton, including Lark Quarry and Bladensburg National Park, are part of the upper member of the Winton Formation (TUCKER et al., 2013). These results permit a more meaningful framework for both regional and global comparisons of the Winton flora and fauna (MANNION et al., 2013; LEAHEY et al., 2015; BELL et al., 2016).

BELL, P.R., 2016. GR, **36**, 473–487.

LEAHEY L.G., 2015. Peer J, 3, e1475.

MANNION P.D. et al., 2013. Zool J Linnean Soc, **168**/1, 98–206.

TUCKER, R.T. et al., 2013. GR, **24**/2, 767–779.

TUCKER, R.T. et al., 2016. GSAB, **128**/9–10, 1461–1480.