

Wordian (Middle Permian) U-Pb CA-IDTIMS isotopic ages from the Lightjack Formation, Canning Basin, Western Australia

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Coal exploration coreholes in the Permian of the Fitzroy Trough (Canning Basin, Western Australia) have intersected thin (<15 cm) ash-fall tuffs in seams from the 30–300-m thick Lightjack Formation. Four of these tuffs within the *Didecitriletes ericianus* spore-pollen zone have yielded high-precision U-Pb zircon CA-IDTIMS ages of 268.63–270.14 Ma, consistent with a Wordian age.

The formation is dominated by siltstone and sandstone, with minor coal and fossiliferous beds near the base, and extends along the major depocentre of the basin (Fitzroy Trough - Gregory Sub-basin), and its margins. The unit spans the Roadian-Wordian-Capitanian based on ammonoids (*Daubichites goochi* and *Bamyaniceras australe*), brachiopods (*Neochonites (Sommeriella) afanasyevae* zone), and palynomorphs (*Dulhuntyispora granulata* to *D. parvithola* zones). Rare conodont genera from the formation include *Vjalovognathus*, *Mesogondolella* and *Hindeodus*.

Tuffs at 57.1 and 58.8 m in exploration corehole Rey-D16C1 on the eastern limb of the Mt Wynne anticline yielded isotopic ages of 268.86 Ma and 269.10 Ma, with permil and sub-permil errors, indicating an early Wordian age (currently 265.8–270 ± 0.7 Ma). A third tuff sample from 77.4 m in a nearby corehole (Rey-LR12C) yielded a 268.63 Ma age. The fourth tuff sample from 210 m in Blackfin Livinga P01 (~64 m above the base of the formation; next to Petaluma 1, ~30 km SW of the other coreholes) is dated at c. 270.14 Ma, essentially at the Roadian-Wordian boundary.