

Integrated Lower Cretaceous stratigraphy from the Aisén Basin, Patagonia, Chile

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The Early Cretaceous is an eventful epoch in the Mesozoic, but data coverage is geographically uneven. New data from underexplored regions, such as South America, help global correlation, our understanding of geologic, biotic and environmental events, and the geologic time scale calibration. The Aisén Basin is a Cretaceous back arc basin in Chilean Patagonia, forming part of the larger Austral Basin. A section at Rio Simpson contains an extended record of Lower Cretaceous formations, suitable for integrated stratigraphic research. This study focuses on fossiliferous strata and zircon-bearing volcanic tuff layers in the Katterfeld Formation, using ammonite biostratigraphy, carbon isotope and Sr isotope stratigraphy and U-Pb radioisotopic dating.

The ammonite fauna is dominated by the endemic genus *Favrella*, represented by three species, of which *F. americana* appears first in the lower Hauterivian, followed by *F. wilkensi* in the Upper Hauterivian. Due to the high paleolatitude, the ammonite fauna is of low diversity and correlation with the Tethyan faunas is difficult. For the first time, an organic carbon isotope curve was developed from this part of the Lower Cretaceous in South America. The $\delta^{13}\text{C}_{\text{org}}$ values from base to the top show an increase from -27‰ to -24‰ and then oscillate around -24.5‰. The pronounced positive shift in the lower part of the section permits correlation with the Late Hauterivian segment in the global curve, known mostly from carbonate carbon analyses of Tethyan sections (FÖLLMI et al., 2006). However, the shift may also be explained by more localised effect of bottom-water upwelling in the Aisén/Austral Basin during the Hauterivian sea-level rise. Two tuff layers yielded zircon U-Pb ages of 129.35 ± 0.05 Ma and 127.52 ± 0.03 Ma. AGUIRRE-URRETA et al. (2015) presented similar ages from a correlative section in the Neuquén Basin, from the base of the Upper Hauterivian and near the Hauterivian/Barremian boundary. Together with other numerical ages reported by VENNARI et al. (2014), the Early Cretaceous timescale can now be improved by new constraints and tie-points from South America.

- AGUIRRE-URRETA, B. et al., 2015. Geol. Magazine, **152**/3, 557–564.
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VENNARI, V.V. et al., 2014. Gondwana Res., **26**/1, 374-385.