

252-8 - Booth No. 100: CARBON ISOTOPE CHEMOSTRATIGRAPHY OF THE LOWER CLASTIC KOOTENAI FORMATION, MT



Wednesday, September 25, 2024



8:00 AM - 5:30 PM



Hall D (Anaheim Convention Center)

Booth No. 100

Abstract

The Kootenai Formation of Western Montana records the Aptian- Albian (121.4Ma-100.5Ma), a significant interval in Earth's history. The Early Cretaceous is notable for a multitude of changes in both the geologic and biotic realm. Significant events that occurred during this time include the tectonic evolution of the Western Interior Basin (WIB) and the displacement of gymnosperms by angiosperms. Given the significance of this time, previous and ongoing research seek to better understand the timing and interactions between these changes. The focus of this study is to refine stratigraphic constraint of the Kootenai Formation using carbon isotope chemostratigraphy. The depositional age of the lower clastic unit of the Kootenai formation has been debated over the past decade. Detrital zircon U-Pb analyses by Laskowski et al. (2013) indicated an Albian age with a U-Pb detrital zircon maximum depositional age (MDA) of 109Ma. However, more recent studies (Finzel and Rosenblume, 2020 and Rosenblume et al. 2021) using LA-ICP-MS-generated detrital zircon U-Pb analyses indicate MDAs of the lower clastic unit as old as Valanginian to Aptian (MDAs ~135-115Ma) with the upper units of the Kootenai having MDAs from Albian (~105 Ma). Detrital zircon U-Pb analyses have generally been limited in the lower units of the Kootenai particularly because syndepositionally formed zircon grains are not common in the lower units (Quin et al. 2018, Finzel and Rosenblume 2020). Additionally, previous flora in the Kootenai suggests predominately Aptian and older ages (Brown 1946). Given the limited geochronologic constraint of the lower clastic unit of the Kootenai formation, addition data is needed. For this study, approximately 60 samples from just above the basal conglomerate to the top of the lower clastic unit were collected and processed to determine bulk organic carbon isotope values. The prior MDAs suggest C isotope excursions such as those associated with OAE1a and even as old as the Valanginian Weissert event could be preserved in the strata of the lower clastic unit. The new stable isotope data will provide an opportunity to refine the age of these Cretaceous units leveraging the existing U-Pb data.

Brown, 1946, *AAPG Bulletin* 30 (2).

Finzel and Rosenblume, 2020, *Tectonics*, 40.

Laskowski et al., 2013, *Tectonics*, 32.

Rosenblume et al, 2021, *Geology*, 49 (3).

Quin et al., 2018, *Geosphere*, 14 (3).

Geological Society of America Abstracts with Programs. Vol. 56, No. 5, 2024
doi: 10.1130/abs/2024AM-404104

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