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High-Resolution Stable Strontium Isotope Records from Middle Ordovician Carbonate rocks.

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Recent advances in analytical techniques have enabled high-precision measurements of stable Sr isotopes ($^{88}Sr/^{86}Sr$), providing new insights into global geochemical cycles. Unlike radiogenic Sr isotopes, stable Sr isotope ratios serve as a novel proxy for understanding carbonate precipitation in the ocean and its relationship to global Sr and C cycles [1, 2].

This study aims to establish a high-resolution stable Sr isotope record from the Middle Ordovician carbonate rocks of the Sino-Korean Block. Carbonate rock samples were from two stratigraphic sections in the central-eastern Korean Peninsula, which have recorded the Middle Darriwilian Isotope Carbon Excursion (MDICE) [3]. A sequential leaching method was applied to selectively extract carbonate minerals from bulk carbonate samples with varying silicate mineral contents. Sr purification was conducted using Eichrom Sr-spec resin (50-100 m) with a vacuum box system (Lafil 400). The Sr recovery rates of the carbonate reference material (JLs-1, limestone) were > 97%. Sr isotope ratios were measured by MC-ICP-MS (Thermo Fisher Scientific Neptune Plus) at the Korea Institute of Geoscience and Mineral Resources (KIGAM). The results for NIST SRM 987 ($^{87}Sr/^{86}Sr = 0.710247 \pm 0.00003$; $^{88/86}Sr = 0.004 \pm 0.03‰$ (2σ)) agree well with reported literature values. The ongoing study will analyze the carbonate rock samples using the confirmed methodologies. The Sr isotope record would provide new insights into marine geochemical evolution during the Middle Ordovician, a period marked by the onset of the main phase of the Great Ordovician Biodiversity Event (GOBE) [4].

[1] Paytan et al. (2021) *Science*, 371, 1346-1350.

[2] Wang et al. (2023) *Nature*, 615, 265-269.

[3] Bang and Lee (2020) *Palaeogeography, Palaeoclimatology, Palaeoecology*, 541, 109534.

[4] Stigall et al. (2019) *Palaeogeography, Palaeoclimatology, Palaeoecology*, 530, 249-270.