

METHODS

- Adhering dirt mechanically removed, and 200-250mg taken for each sample
- Collagen isolation:
 - Demineralization – samples placed in 0.5M HCl for 36-48 hours
 - Rinsed to neutrality with deionized water
 - Humic Extraction – samples placed in 0.1M NaOH for cycles of 30 minutes, and cycles repeated until solution remained clear
 - Rinsed to neutrality with deionized water
 - Collagen Refluxing – samples placed in 0.01M HCl and in the oven for 36 hours
 - Samples frozen for 48 hours, then freeze dried for 48 hours

(Guiry & Szpak, 2021)

ANALYSIS

- Trent University Water Quality Centre – Isoprime visIION IRMS
 - Three-point calibration curve based on USGS40, SRM-23, USDS41a, and USGS63
 - Internal standards used as quality control: SRM-35 (porcine collagen) and SRM-26 (marine fish collagen)
 - Linearity assessed using SRM-26
 - Estimated standard uncertainty for $\delta^{13}\text{C}$ was ± 0.20 per mil, and for $\delta^{15}\text{N}$ ± 0.29 per mil

(Szpak, 2026)

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