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CHONDRICHTHYAN ICHTHYOLITHS SUGGEST UNEVEN GLOBAL DIVERSITY DURING THE LATE TRIASSIC

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The Triassic Period was an important time for chondrichthyans, which underwent a variety of environmental invasions (into fluvial and lacustrine environments) and ecological innovations (*e.g.:* shell-crushing dentitions). Chondrichthyan preservation, mostly being limited to ichthyoliths (mostly dental and dermal denticle debris), differs from other marine vertebrate taxa, which are occasionally preserved as articulated specimens. In contrast to the articulated remains, ichthyoliths can be common elements among biosediments in shallow marine environments, where articulated vertebrates are unlikely to be well-preserved, thus contributing to the overall diversity of the system. Chondrichthyans may therefore be a model taxon for utilizing ichthyoliths to reveal marine vertebrate diversity in deep time.
Ichthyoliths were extracted from Norian (Late Triassic) subtidal sediments from Nevada and New Zealand. These two regions have very few chondrichthyan occurrence records, ichthyolith or otherwise, and were examined in order to compare diversity metrics and paleobiogeographic ranges and patterns between major marine basins through the Triassic.
From Nevadan samples, four chondrichthyan taxa out of eleven vertebrate genera were observed. Three chondrichthyan genera are reported for the first time, suggesting that ichthyoliths may be key for

uncovering diversity patterns in this region. Preliminary extractions from New Zealand suggest that ichthyoliths are exceedingly rare, with very few fish ichthyoliths overall. New Zealand samples have no confirmed chondrichthyans; however, an isolated *Hybodus* was previously reported. Among the total fish diversity, more than half overlap with those observed in Nevada. The non-chondrichthyan taxa from New Zealand include *Gyrolepis*, a cosmopolitan genus, and few endemic taxa. These results suggest that New Zealand vertebrate assemblages were depauperate with only rare occurrences of chondrichthyans relative to other Late Triassic ichthyolith assemblages.

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