

## Rare evidence of shark-on-shark trophic interactions in the fossil record

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Direct evidence of chondrichthyan trophic interactions in the fossil record is largely limited to bite traces on prey items but may also be found within the gut contents of exceptionally well-preserved individuals or as inclusions within coprolites. Shark bite traces are typically observed on durable, bony skeletal elements. Previous publications have shown shark bite traces on skeletal elements of fossil fishes, marine mammals, marine reptiles, and even a pterosaur, offering direct evidence of active predation, failed predation, and/or scavenging. Herein, we describe the first evidence of shark bite traces preserved on cartilaginous vertebral centra of other sharks. Four carcharhiniform centra have been identified from the Neogene Atlantic Coastal Plain, bearing chondrichthyan bite traces, of which two have partial teeth still embedded within them. In one specimen, CMM-V-2700, CT scans showed remodeling of the tissue around two partial teeth embedded in the centrum, indicating that the bitten individual survived the encounter. While shark-on-shark predation is common among living taxa, capturing evidence of these interactions in the fossil record is exceptionally rare.

**Key words:** Chondrichthyes, Carcharhinidae, trophic interaction, shark predation, shark-on-shark, bite traces, trace fossils, Neogene.

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