## GSA Annual Meeting in Indianapolis, Indiana, USA - 2018

Paper No. 80-9
Presentation Time: 10:30 AM

# CAN EVOLUTIONARY ESCALATION DRIVE CHANGES IN PALEOECOLOGICAL STRUCTURE?: A CASE STUDY FROM THE NORIAN STAGE (LATE TRIASSIC) OF WESTERN NEVADA

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Over time, populations of organisms adapt to the conditions that comprise their environment, including interactions between that population and their predators and/or prey. Recognizing the evolutionary and paleoecological influence of these interactions on shallow marine taxa in the rock record is difficult due to the differential preservation of most shelly benthic invertebrates and common predator taxa like vertebrates and arthropods. The former group is often an abundant autochthonous component of sedimentary deposits while the latter is rarely preserved in shallow settings and much of our understanding of their diversity patterns depends on lagerstätte-style preservation in unique conditions. A key paleoecological and evolutionary interval for benthic ecosystems, the Norian Stage of the Late Triassic, is a strong candidate for a biologically-driven ecological transition, in which predator-prey interactions may have escalated and led to global shifts in marine ecosystem structure. Here we present preliminary results for an investigation into the role of evolutionary escalation in driving community-level ecological change using a dual dataset of benthic macrofossils and vertebrate microfossils, and functional morphological characters to relate fossils to likely behaviors.

Extracted microfossil populations suggest that the Early Norian marine environments were more likely to contain small generalist predators than later in the Norian, when populations of teeth contained higher proportions of semi-specialized to specialized features, both for durophagy (shell-crushing) and shearing carnivory. This transition is correlative with a paleoecological shift among shelly benthic populations, which became increasingly dominated by infaunal and cementing taxa during the Norian Stage, and may reflect a local predator population that is more adapted for shell mastication on the sediment surface. While preliminary, these features are largely in agreement with the global record of predator diversity and with changes in benthic invertebrate assemblages in other ocean basins during the Norian Stage. Further research is needed to evaluate temporal and biogeographic patterns of predator radiations and appearances of anti-predator adaptations.

Session No. 80

T37. Global Change: Evolution and Extinctions in the Triassic
Monday, 5 November 2018: 8:00 AM-12:00 PM
Room 136-137 (Indiana Convention Center)
Geological Society of America *Abstracts with Programs.* Vol. 50, No. 6
doi: 10.1130/abs/2018AM-324546