

PHANEROZOIC PARASITISM AND MARINE METAZOAN DIVERSITY – DILUTION VERSUS AMPLIFICATION

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Growing evidence suggests that biodiversity mediates parasite prevalence. We compiled the first global database on occurrences and prevalence of marine parasitism throughout the Phanerozoic and assess the relationship with biodiversity to test if there is support for amplification or dilution of parasitism at the macroevolutionary scale. Median prevalence values by Era are 5% for the Paleozoic, 4% for the Mesozoic, and a significant increase to 10% for the Cenozoic. We calculated Period-level shareholder quorum sub-sampled (SQS) estimates of mean sampled diversity, three-timer (3T) origination rates, and 3T extinction rates for the most abundant host clades in the Paleobiology Database to compare to both occurrences of parasitism and the more informative parasite prevalence values. Generalized linear models (GLM) of parasite occurrences and SQS diversity measures support both the amplification (all taxa pooled, crinoids and blastoids, and mollusks) and dilution hypotheses (arthropods, cnidarians, and bivalves). GLMs of prevalence and SQS diversity measures support the amplification hypothesis (all taxa pooled and mollusks). Though likely scale-dependent, parasitism has increased through the Phanerozoic and clear patterns primarily support the amplification of parasitism with biodiversity in the history of life.