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Consequences of a gelatinous body plan

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Gelatinous zooplankton include taxa of widely differing life histories, trophic positions, sizes, and phylogenies. The diversity spans nearly all marine phyla, ranging from colonial salps that filter microbial prey to large medusae that prey on fish. The “Jelly Ocean Hypothesis” posits that gelatinous zooplankton are increasing globally in abundance. While this hypothesis is still a matter of debate, it raises the question of why we might expect a similar response across such a diverse group of animals. One possible explanation is that the gelatinous body plan itself lends itself to certain characteristics of population dynamics. To test this idea, we indexed zooplankton on a scale from gelatinous to crustacean based on a body carbon to volume ratio. We then examined the time series properties and spatial properties of zooplankton samples as functions of this index. Many of these properties, such as patchiness, cyclicity, and variance, depend significantly on body plan and not on other organizational indices, such as trophic position or size. These results support the argument that similar trends observed across diverse gelatinous zooplankton are a consequence of the gelatinous body plan.

Keywords: gelatinous zooplankton, body plan, jellyfish, crustacean

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