

Different tolerance of jellyfish ephyrae (*Aurelia* sp.1) and fish larvae (*Paralichthys olivaceus*) for nutrient limitations

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Abstract

Over the decades, nutrient (N and P) compositions of many coastal waters have deviated far from the Redfield ratio. In ecological stoichiometry, this nutrient imbalance could transport up food chains and make higher trophic-level organisms suffer from nutrient limitations, including jellyfish and fish. We did experiments to estimate the tolerance of jellyfish ephyrae (*Aurelia* sp.1) and fish larvae (*Paralichthys olivaceus*) for nutrient limitations from three respects of growth, survival, and elemental homeostasis. Nutrient limitations showed significantly negative effects on the growth condition of fish larvae ($P < 0.01$). However, when it comes to jellyfish ephyrae, no significant difference was detected between the nutrient-sufficient treatment and the P-limited treatment ($P > 0.05$). The 10% lethal time of jellyfish ephyrae was much longer than that of fish larvae. In terms of elemental homeostasis, the $1/H$ for each stoichiometry of jellyfish ephyrae was much closer to zero than that of fish larvae, implying that jellyfish ephyrae offered higher abilities than fish larvae to keep chemical compositions constant. Results above indicated that, with regard to the tolerance for nutrient limitations, jellyfish ephyrae could be more competitive than fish larvae. Additionally, the content of amino acids, not fatty acids, offered the just right same pattern with growth conditions of fish larvae among three treatments, suggesting that the content of amino acids could be a limiting factor. This study could provide additional evidence for how the eutrophication promotes the jellyfish populations increasing and draw attention to the amino acids content which played an important role in determining the food quality.

Keywords: ecological stoichiometry, phosphorus limitation, nitrogen limitation, jellyfish ephyrae, fish larvae.

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