
Energy packing of reef fish communities in isolated oceanic islands

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Abstract

Underwater, tropical oceanic islands are generally portrayed as oligotrophic environments, occasionally subsidised in energy from different sources, for instance guano from land, or nutrients from upwelling events. However, we still lack (1) quantitative estimates of the amount of energetic subsidise entering marine communities in isolated tropical oceanic islands, and (2) understanding of the potential drivers for these subsidise. Here I use a theoretical approach based on first principles of energy-mass balance to quantify the fraction of reef-fish carbon consumption that is likely to be dependent from allochthonous sources in oceanic islands all over the globe. For that, I use a meta-analysis of fish respiratory rates combined with a recent global dataset of reef-fish community structure, and satellite-derived data. Preliminary results indicate that oceanic islands in the Tropical Eastern Pacific and central Atlantic are heavily subsidised, primarily through trophic levels that utilise plankton as a major food source. In this talk I will discuss how much of this subsidise can be explained by a number of biotic and abiotic factors, for the entire community and different trophic groups.

Keywords: metabolic theory, coral reefs, energetics, respiration, carbon cycle

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