



## Extreme food webs: Foraging strategies and diets of scavenging amphipods from the ocean's deepest 5 kilometers

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**ABSTRACT:** We explore hypotheses that alternate foraging strategies, diet, or nutrient partitioning could help explain the success of scavenging Lysianassoids (Amphipoda) in hadal oligotrophic trenches (depths of 6-11 km) by examining the nutritional strategies of four lysianassoid species (*Eurythenes gryllus*, *Scopelocheirus schellenbergi*, *Hirondellea dubia*, and *Uristes* sp. nov.) collected with baited traps (6.3-10.8 km) from the oligotrophic Tonga and Kermadec Trenches (southwest Pacific Ocean). Diets and foraging strategies were examined by use of (1) the nascent DNA-based analysis of hindgut contents, which provides a [snapshot] of recently ingested organisms, and (2) natural abundance isotopic signatures, which reflect the source of nutrition and relative trophic position. The scavenging guild exhibits remarkable trophic plasticity, and each amphipod species employs alternate foraging modes, including detritivory or predation, to supplement necrophagy. The nutritional strategies of some species appear to shift with age, depth, and even between trenches. Thus, there is no single ubiquitous hadal food web; rather it is influenced by depth and overlying surface productivity. Isotopic data suggest that coexisting species partition the dietary items, providing evidence of competition among members of the scavenging guild. The extreme foraging flexibility of scavenging amphipods may ultimately contribute to their success in severely foodlimited hadal ecosystems.

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