

Trophic structure and feeding behaviour of two co-occurring species of deep-sea sharks

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Abstract

Two of the most species-rich fish communities in Icelandic waters are found at the southwest and southeast parts of the upper continental slope. In these areas the sympatric black dogfish (*Centroscyllium fabricii*) and great lanternshark (*Etmopterus princeps*), of the family Etmopteridae, are frequently caught in groundfish surveys at depths of 400-1200 m. As a part of a larger ongoing research on the trophic structure of the deepwater ecosystems, the aim of this study is to analyse feeding habits and estimate trophic positions of the two species within these communities. We used stomach content analysis (SCA) and stable isotope analysis (SIA) of nitrogen and carbon. Additionally, mixing models were applied to determine the contribution of groups of potential prey to these sharks' diets. According to SCA, fish were the main food of both species by weight, numbers and frequency of occurrence of prey categories. The proportion of euphausiids and shrimps in stomachs of black dogfish was high, but great lanternshark appears to prey relatively more upon cephalopods. Jellyfish were found in relatively high abundance in both species. In comparison to black dogfish, great lanternshark displayed higher body values of both $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$. Although higher $\delta^{15}\text{N}$ may suggest higher trophic position of great lanternshark, the values for black dogfish were highly variable and partly overlapped those of great lanternshark. Results from mixing models indicated omnivorous pattern of feeding. This study is the first attempt to describe trophic ecology of the Icelandic slope by using stable isotope analysis

Keywords:

trophic structure, stable isotope analysis, deepwater ecosystem, deep-water sharks, *Centroscyllium fabricii*, *Etmopterus princeps*.

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