405

ANTARCTIC TROPHIC COMPLEXITY – A QUESTION OF NICHE WIDTH?

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We apply the concept of niche theory, where separation in a multidimensional niche space allows coexistence, to grasp the complexity associated with the highly diverse Antarctic system. Here we introduce a 3-dimensional index of trophic niche width, which is based on prey size, prey trophic position, and prey mobility that was used to compare and to group 489 mainly omnivorous consumer species of the high Antarctic Weddell Sea shelf. Diet composition of each species was inferred from field observations, stomach content-, stable isotope- and predation analyses. Average body size of resource species was taken from published accounts. Trophic position of resource species was determined by stable nitrogen isotope ratios. The index of trophic niche width reflects common trophic traits within the marine high Antarctic. It indicates that the high trophic complexity of this system results from the high trophic generality of most consumers as well as their ability for vertical niche expansion. Further questions addressed by our niche width measure might be (i) species distribution along environmental gradients, (ii) similarity of coexisting species, (iii) the role of species in community succession and assembly, and (iv) patterns of biodiversity.