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Effects of prey type and quality on *Mnemiopsis leidyi* feeding and carbon assimilation: a trophic biomarker approach

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The invasive success of the ctenophore *Mnemiopsis leidyi* is partly related to its broad diet, which mainly consists of micro-, meso- and ichthyoplankton. Next to gut content analyses, which only provide a snapshot of the diet, grazing experiments and trophic biomarkers contribute to our understanding of *M. leidyi's* feeding ecology. Grazing experiments were executed to determine the feeding rate of *M. leidyi* on *Artemia salina* and *Acartia tonsa* as small crustaceans, and on eggs and larvae of *Dicentrarchus labrax*. No significant differences in *M. leidyi* clearance rates (av. 0.2 ± 0.1 $L.mL_{M.leidyi}^{-1}.h^{-1}$) were observed between prey types or sizes. Secondly, ^{13}C tracer experiments were performed to determine carbon assimilation in *M. leidyi,* by offering enriched diatoms and the above mentioned animal prey as food sources. Highest carbon assimilation was observed for *Acartia* and sea bass larvae, and lowest for *Phaeodactylum*. To further elucidate prey-dependent variation in carbon uptake, the fatty acid composition was investigated, as a proxy for food quality. The consumption of sea bass larvae, characterized by higher levels of DHA (an essential fatty acid), resulted in significantly higher FA concentrations in *M. leidyi*. As *M. leidyi* does not convert excess food into storage lipids, it is likely that growth and reproduction will be enhanced when feeding on high quality food sources. A potential temporal overlap between the occurrence of *M. leidyi* and the high energetic fish larvae (*e.g.* due to global warming) may substantially impact the ichthyoplankton community in areas where *M. leidyi* has been introduced.

Keywords: non-indigenous ctenophore, grazing and tracer experiments, stable isotopes, fatty acids, biomarkers

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