ESTIMATING TURNOVER RATES OF $\delta^{13}C$ AND $\delta^{15}N$ IN MUSCLE, HEART AND LIVER TISSUE OF JUVENILE SAND GOBIES (*POMATOSCHISTUS MINUTUS*)

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Large numbers of marine fish typically enter and remain within estuaries during their juvenile life stage. Stable isotopes of carbon and nitrogen can serve to trace these individual movements due to the food web differences among marine and estuarine habitats. Here, we present the background for the utilization of $\delta^{13}C$ and $\delta^{15}N$ to analyze the migration dynamics of juvenile sand gobies (*Pomatoschistus minutus*), between the North Sea and the Scheldt Estuary. The isotopic turnover of *P. minutus*, defined as the change in isotopic composition due to growth and metabolic tissue replacement, was examined for muscle, liver and heart tissue. A diet switch experiment simulating natural conditions for the Scheldt Estuary was conducted during 90 days. Fish were fed a commercial pellet diet, which was isotopically different from the initial goby tissue $\delta^{13}C$ and $\delta^{15}N$. Chopped polychaetes (*Arenicola* sp.) and mussels (*Mytilus edulis*) were used as control diets to test for effects other than diet. Fish were sacrificed for stable isotope analysis (CF-IRMS) on regular time intervals depending on the diet. Trophic fractionation was estimated for the different tissues and the effect of food deprivation on stable isotope composition was also evaluated. Heart and liver tissues had a faster isotopic turnover than muscle tissue as a result of their higher metabolism. However, growth was found to explain most of the variation in isotopic composition within a single tissue. There was no significant effect of 20 days of food deprivation on $\delta^{13}C$ and $\delta^{15}N$ for the tissues. The isotopic assay of muscle, liver and heart tissue within and among individuals will allow a better delineation of those individuals not in equilibrium with their isotopic environment. Therefore new arrivals in the estuary will be identified on a finer temporal resolution than feasible with muscle tissue alone.