

**Turnover rates of carbon and nitrogen stable isotopes in the amphipod *Gammarus aequicauda*: insights for trophic studies of Mediterranean macrophytodetritus accumulation.**

François REMY<sup>1\*</sup>, Aurélie Melchior<sup>1</sup>, François Darchambeau<sup>2</sup>, Gilles Lepoint<sup>1</sup>

1. MARE Centre, Laboratory of Oceanology, University of Liège, B6c, 4000 Liège, Belgium

2. Chemical Oceanography Unit, University of Liège, Liège, Belgium

(\*François REMY : [francois.remy@ulg.ac.be](mailto:francois.remy@ulg.ac.be) )

A quite diverse and abundant macrofauna assemblage is found in the Mediterranean Sea in exported *Posidonia oceanica* macrophytodétritus accumulations along with meiofauna, microalgae, fungi and bacteria. This study focused on a dominant vagile macroinvertebrate species living and feeding in exported dead *P.oceanica* leaves litter from Calvi Bay (Corsica, France): *Gammarus aequicauda*. Results of gut content observations and stable isotope analysis (SIAR data) showed clearly that *G. aequicauda* is the most important dead *P. oceanica* consumer with up to 50% of dead leaves contribution.

An isotopic turnover experiment was conducted with 3 controlled simultaneous treatments: 1. amphipod feeding for 43 days, 2. Green algae feeding for 30 days and 3. *Posidonia oceanica* litter feeding for 30 days. Individuals (n = 12 to 16) have been sampled every 7 days and whole individual stable isotope analysis have been conducted. An exponential decay regression model and calculations resulted in half-lives for C ranging from 11.72 days (treatment 1) to 51.62 days (treatment 3). Treatment 2 data did not allow us to fit a curve, consequence of a potentially very low turnover rate. For N, no significant increase or decrease of the  $\delta^{15}\text{N}$  values have been observed, and we thus concluded that  $\delta^{15}\text{N}$  was at the equilibrium from the beginning to the end of the experiment. It appears that amphipods feeding on low quality food (high to very high C/N ratio) like algae and Neptune grass dead leaves, show a lower turnover rate for C than amphipods feeding on a high quality animal food (low C/N ratio). Carbon and Nitrogen stable isotope “Trophic Enrichment Factor” (TEF) were calculated for treatments where  $\delta^{13}\text{C}$  or  $\delta^{15}\text{N}$  were at the equilibrium at the end of the experiment. Calculated TEF for nitrogen ranged from  $0.53\text{‰} \pm 0.439$  to  $0.96\text{‰} \pm 0.424$  for treatment 2 and 3 (consistent with detritus-feeder invertebrate values) and was  $2.91\text{‰} \pm 0.558$  for treatment 1 (consistent with predator invertebrate values). For C calculations, a TEF of  $0.81\text{‰} \pm 0.39$  for treatment 1 and a TEF of  $1.19\text{‰} \pm 0.824$  for treatment 3 were calculated.