# Leaf fall impact on diversity and trophic ecology of vagile macrofauna associated with exported *P.oceanica* litter.

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## Introduction

*Posidonia oceanica* **seagrass** meadows produce a huge amount of **detritus** (300 to 2000 g.dry.wt.m$^{-2}$yr$^{-1}$). *P. oceanica* ecosystem presents similar traits with tempered deciduous forest ecosystem (eg: important leaf fall event in the autumn period). **Leaf fall** in *P. oceanica* ecosystem is a major event which influences the exported detritic compartment and its associated **macro-invertebrates**. We tried to assess the influence of leaf fall on the **biodiversity** and **trophic diversity** of *P. oceanica* exported litter macro-invertebrates.

## Methods

- Revellata Bay (STARESO)
- 2 sampling sites, 2 seasons
- **Standardized** samples
- Evaluation **of biodiversity**
- **Isotopic** measurements (IRMS)
- **SIAR** Bayesian mixing model

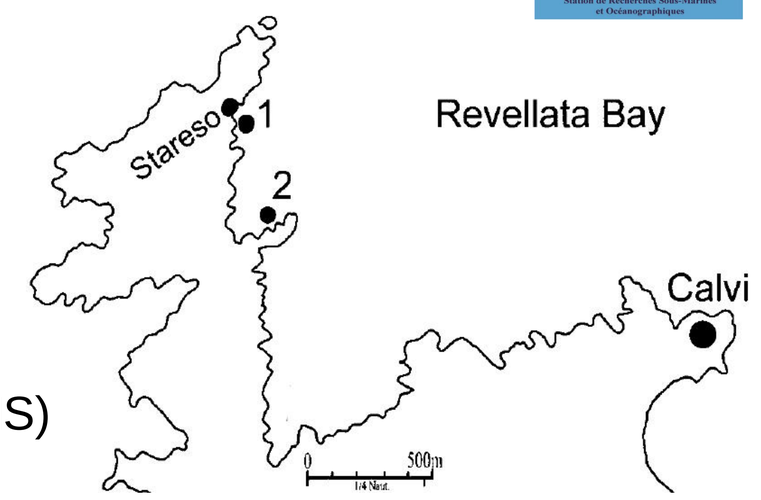


**Fig 1** : location of the sampling sites in Revellata Bay (Calvi, Corsica) 1: STARESO, 2: Oscelluccia

## Results

### A) Biodiversity

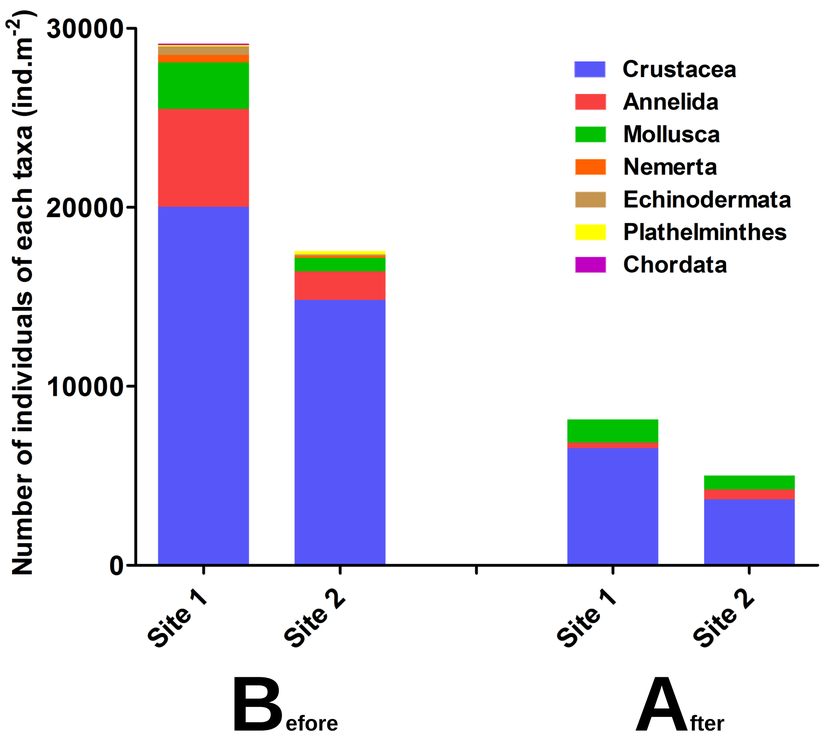


**Fig 2** : number of individuals (ind.m-$^2$) of each taxa at each sampling site before and after leaf fall. B : before leaf fall, A: after leaf fall.

Proportionally more crustaceans at site 2 before leaf fall, and proportionally more crustaceans at site 1 after leaf fall. Proportionally more Annelids than Molluscs before leaf fall and this pattern is inverted after leaf fall. Higher global abundance before leaf fall. Higher biodiversity before leaf fall (**H'**=2,71 and 100 species) than after leaf fall (**H'**=1,38 and 37 species). Higher biodiversity at site 1 before leaf fall, and this pattern is inverted after leaf fall.

### B) Trophic diversity

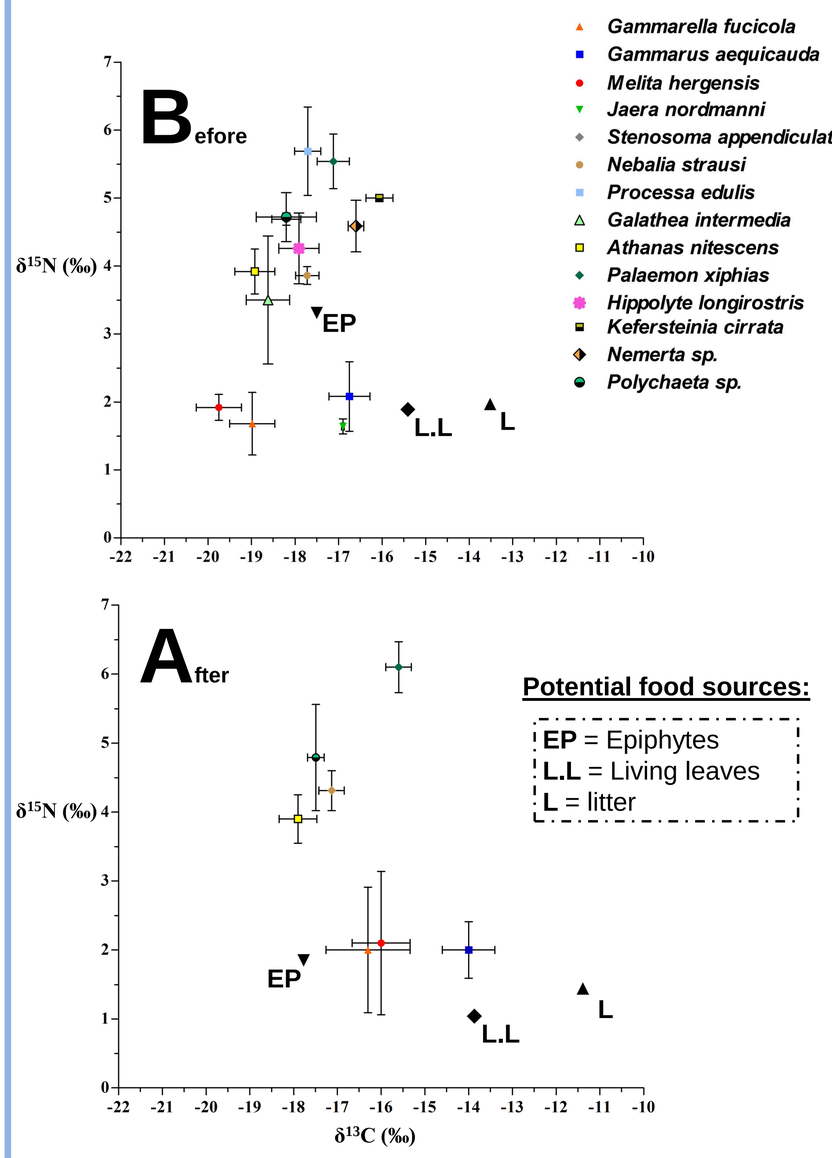


**Fig 3** : graphs showing the isotopic signatures for $^{13}$C and $^{15}$N of the most common macro-invertebrates and the major potential food sources of *P. oceanica* litter (delta form in « per mil », **‰**). B: before leaf fall, A: after leaf fall.

Focus: ***Gammarella fucicola*** (crustacean amphipod).

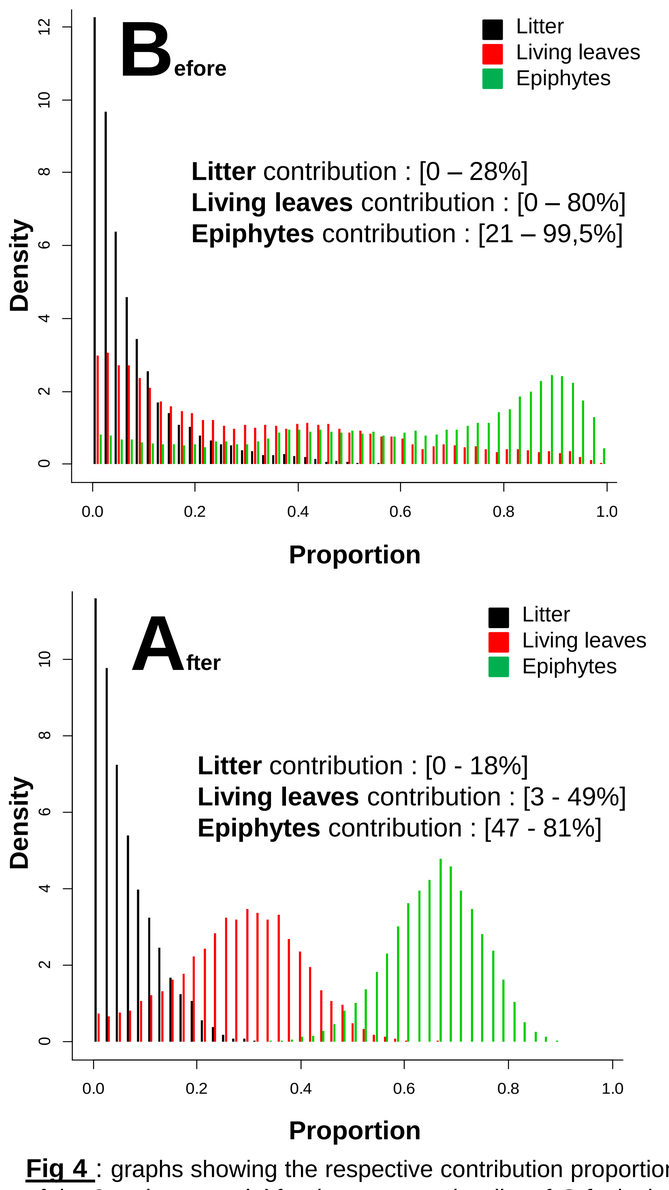


**Fig 4** : graphs showing the respective contribution proportion of the 3 major potential food sources to the diet of *G.fucicola* . The contribution values are the CI 95%. B: before leaf fall, A: after leaf fall. Custom TEF used were 0.2 ± 0.6 ‰ for Δ13C and 1.2 ± 0.5 ‰ for Δ15N (from Michel 2011).

## Discussion

We here show a somewhat **diverse community** (more than 115 species) where crustaceans are dominant, and more precisely, the amphipod ***G. fucicola*** representing up to **55%** of the litter macro-fauna. We also show a community with **low δ$^{15}$N** primary consumers, carnivorous species with **higher δ$^{15}$N**, and omnivorous species with **intermediate δ$^{15}$N** . With the **SIAR** results, we can see that even if the dominant crustacean species **ingest** litter leaves, it seems **not to assimilate** the major part of it's carbon from this food source. *G. fucicola* seems to assimilate it's carbon mainly from epiphytes and to a lesser degree, from living *P. oceanica* leaves. We can also highlight **major abundance and biodiversity differences** between summer (before leaf fall) and autumn (after leaf fall). It's important to see that these huge community modifications **don't seem to affect the diet** of most of the litter macro-invertebrates as the general isotopic signatures pattern remains quite constant.

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