Methods S1: Selectivity indices of Hurlbert and Smith

The index B of Hurlbert (1978, *Ecology*, 59:67-77) and the index FT of Smith (1982, *Ecology*, 63:1675-1681) are also used in the literature to determine the trophic selectivity of organisms. They were calculated as follows:

$$B = 1/\sum(q_i^2/p_i) \tag{S.1}$$

$$FT = \sum \sqrt{(q_i * p_i)} \tag{S.2}$$

where p_i stands for the availability of the resource i in the environment (i.e. the relative abundance in terms of OC content) and q_i stands for the dietary use of this resource i (i.e. the proportion in the diet, in terms of C & N atoms assimilated in the consumer tissues). These two indices measure the similarity between the distribution of resource availability and resource use. To highlight the dissimilarity between these distributions (i.e. the selectivity), we made the same modification of these two indices as for the Proportional Similarity index (PS) of Feinsinger et al. (1981, *Ecology*, 62:27-32):

$$B' = 1 - B \tag{S.3}$$

$$FT' = 1 - FT \tag{S.4}$$

The two selectivity indices B' and FT' thus actually reflect the degree of consumer selectivity and range from 0 (non-selective feeding) to 1 (highly selective feeding). They were calculated for all species (table S1).

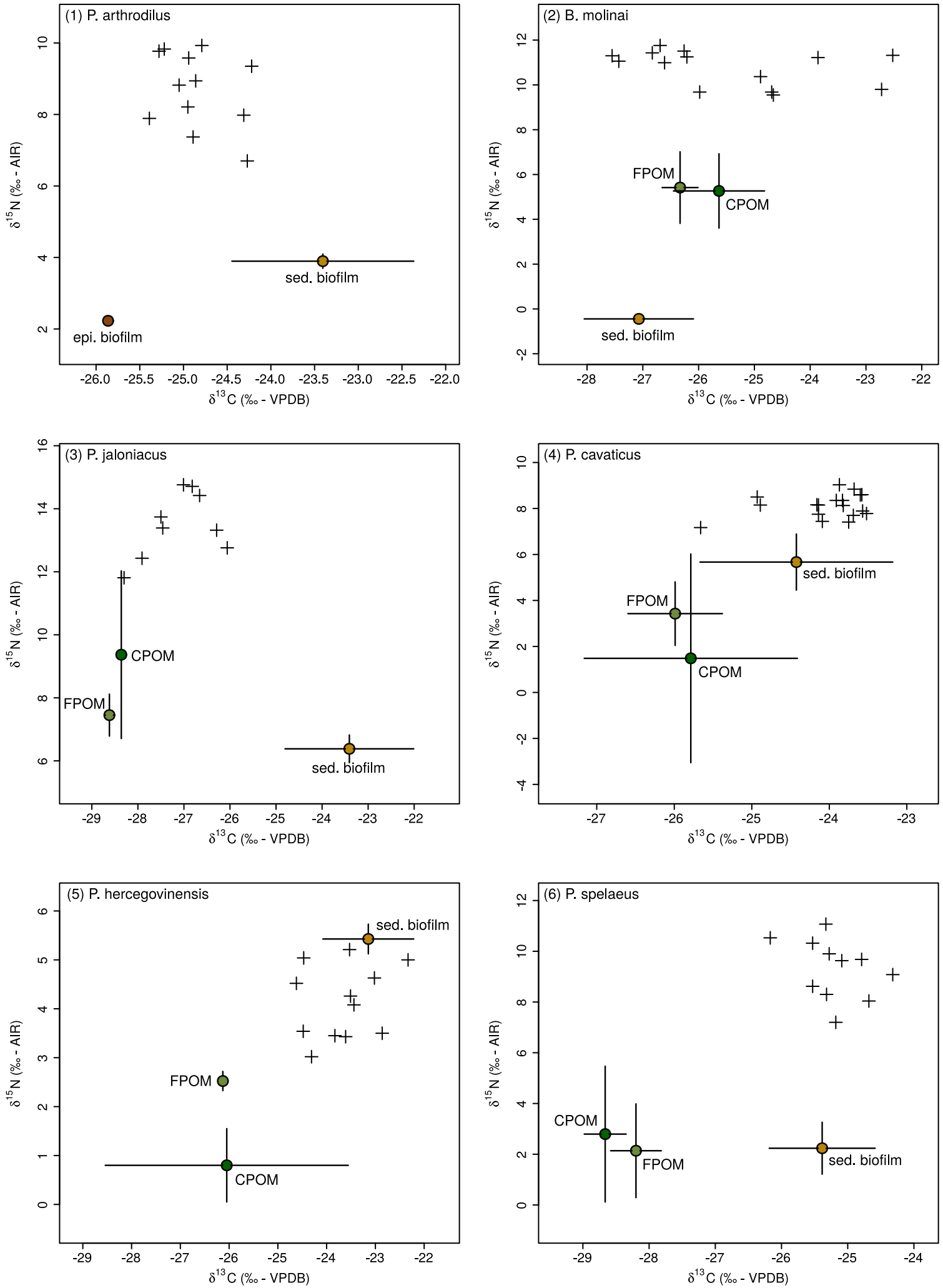
Note S1 : Discussion of the isotopic analyses

For one species (*P. coiffaiti*), the difference between the C isotopic signatures of algae and consumers was not consistent with the discrimination factor (Δ13C = 0.4 $\pm$ 1.3) (see Supplementary Figure S1, site 10). Although previous experimental studies have evidenced that algae are edible by asellids (Moore 1975, Journal of Animal Ecology, 719-730), in this case the discrepancy between algae and *P.coiffaiti* individuals δ13C ($>$ 6 ‰) makes it questionable for algae to be substantially assimilated by these isopods, even if SIAR model outputs a relative contribution of 19% (12% $-$ 25% CI). Based on the literature, we chose to keep algae as a potential source for consumers. Nevertheless, we checked that excluding algae from the analyses did not change the ranking of the contribution of the other resources to the diet and gave alternative values of PS´ (0.375) and RA (16.69 g OC.m^{-2}) congruent with the regression line drawn in Fig. 3a. Moreover, removing this species from the dataset did not alter the relationship between resource availability and trophic selectivity (n=14, PGLS; P-value = 0.004 and R^2 = 0.47).

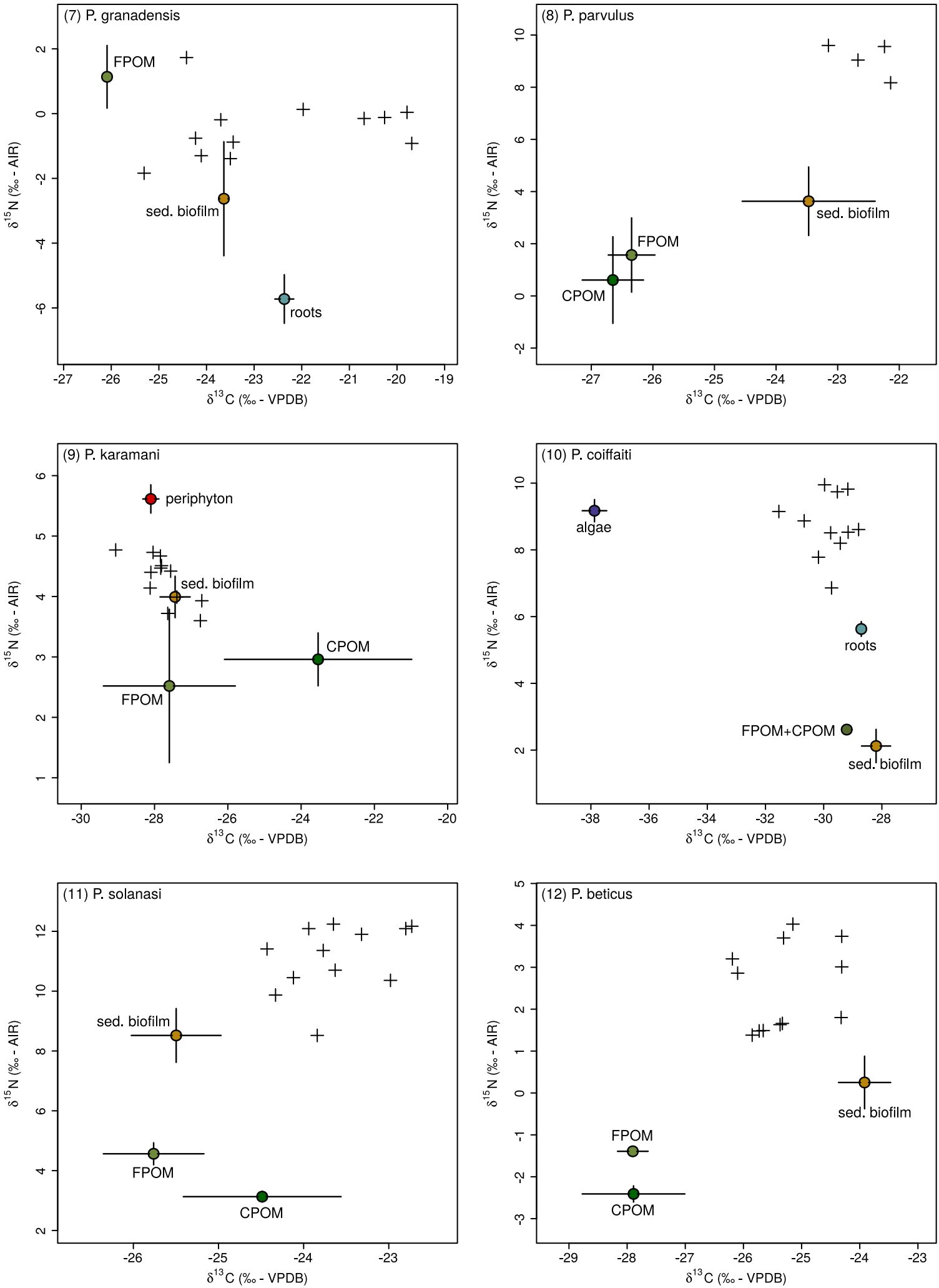
Thus the discrepancy observed in the isoplot of this species did not compromise our conclusions.

For all other species, the qualitative assessment of the isoplot was consistent with the results of the Bayesian mixing model.

(Figure S1, panel A)



(Figure S1, panel B)



(Figure S1, panel C)

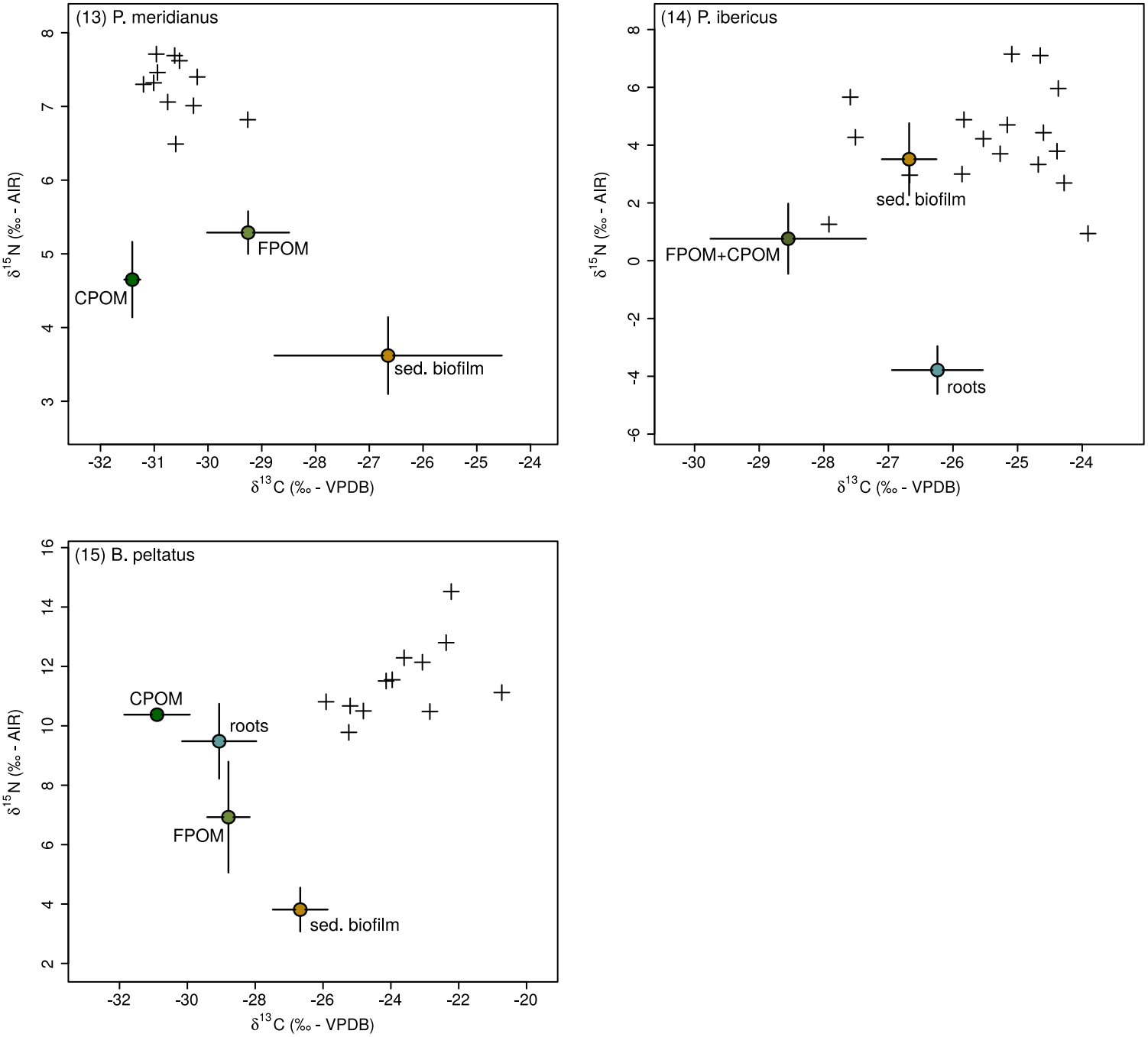


Figure S1: Carbon and nitrogen stable isotope compositions of trophic resources (○) and whole individuals (+) for the 15 isopod species. Species are sorted by increasing energy availability in their respective environments (numbers in brackets correspond to the 'species-environment' codes as in table 1). Color code for trophic resources as in figure 2. sed. biofilm: sedimentary biofilm; epi. biofilm: epicuticular biofilm; FPOM: Fine Particulate Organic Matter; CPOM: Coarse Particulate Organic Matter. Bars represent standard deviations around mean values.