



Feeding ecology and habitat use of toothed cetaceans from the NW Iberian Peninsula inferred from stable isotopes.

Méndez - Fernandez P., Bustamante P., Chauvelon T., Ferreira M., López A., Pierce G., Spitz J., Vingada J., Caurant F.

Marine mammal ecology can be studied through their diet and their feeding habits. A combination of distinct approaches might be a better way to assess population structure. This is why ecological tracers are suitable for studying feeding habits and/or a habitat exploited by the individuals. Here, we use the $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ stable isotopes to compare the toothed cetacean community and their prey in two adjacent areas, the **NW Iberian Peninsula (NWIP)** and the **Bay of Biscay (BB)**.



Fig.1. Map of study area

Organ	Specie	Cetaceans		Prey	
		NWIP	BB	NWIP	BB
Muscle	<i>Phocoena phocoena</i> (Pph)	19	19	<i>Merluccius merluccius</i>	8
	<i>Stenella coeruleoalba</i> (Sco)	21	36	<i>Sardina pilchardus</i>	15
	<i>Tursiops truncatus</i> (Ttr)	9	12	<i>Trachurus trachurus</i>	19
	<i>Delphinus delphis</i> (Dde)	114	126	<i>Micromesistius poutassou</i>	10
	<i>Globicephala melas</i> (Gme)	9	16	<i>Engraulis encrasicolus</i>	5
				<i>Loligo vulgaris</i>	2
				<i>Scomber scombrus</i>	14
				<i>Trisopterus luscus</i>	3

Table 1. Cetacean muscle sample

$\delta^{13}\text{C}$ Habitat tracers

Same habitat segregation in both areas:

- *Sco* the most oceanic signature
- *Gme*, *Ttr* and *Pph* the most neritic
- *Dde* an intermediate position

The NWIP prey shows also a gradient which is clearer than BB:

- *T.luscus*, *E. encrasicolus* and *S. pilchardus* the most neritic signature

In BB this gradient is less clear:

- *T.luscus* and *L.vulgaris* still in a neritic position

NWIP prey have a more widely spread signature and there are more enriched in carbon than cetaceans and BB prey

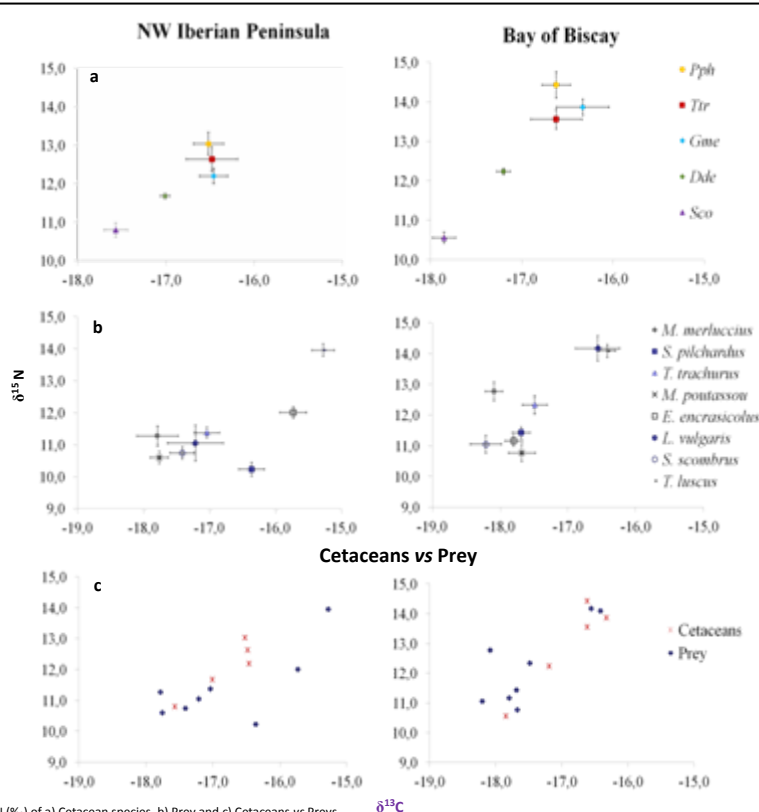


Fig 2. Mean (±se) values of $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ (‰) of a) Cetacean species, b) Prey and c) Cetaceans vs Preys

$\delta^{15}\text{N}$ Trophic level Indicator

Same trophic structure in both areas, but higher values in BB compared to NWIP, except for *Sco*:

- *Sco* the lowest trophic position
- *Gme*, *Ttr* and *Pph* the highest
- *Dde* an intermediate position.

From the NWIP:

- *T.luscus* the highest trophic position
- The other species are not clearly distinguished.

In BB the trophic position is higher for all species (as in Fig 2. a):

- *T.luscus* the highest position
- *L.vulgaris*, *T.trachurus* and *M.merluccius* an intermediate position

In these graphs we wanted to show the different trophic levels between the Cetaceans and Prey, but there is no difference in BB and not too much in NWIP

Conclusions

✓ To sum up, stable isotopes show the same toothed cetacean community structure in the two adjacent areas. However, we didn't find consumers in a clearly higher trophic position than prey.

✓ This study indicates the different complexities of the food web for both areas and their importance when studying the consumer trophic relationships.

✓ Isotopic tracers are a good tool for investigating community structure but this method needs to be combined with other traditional (e.g food analysis) and integrated approaches (e.g other ecological tracers), especially for complex ecosystems.