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Sentinels from the west coast of the Baja California Peninsula: Isotopic niche assessment of male California sea lions

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Knowledge about the trophic ecology of California sea lions (*Zalophus californianus*) in Mexico is based mainly on the analysis of feces from adult females or using pups as maternal isotopic indicators (e.g., Amador-Capitanachi *et al.*, 2020). Access to males is logistically complicated, making them a poorly known portion of the population. Based on subadult males sampled (vibrissae and hair) as part of a mass stranding on the west coast of the Baja California Peninsula, Mexico, in September 2020, we sought to determine their trophic variability, through the evaluation of isotopic niches and long-term series along vibrissae, and their relationship to niche partitioning and interannual environmental variability.

Data for both isotope ratios ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) in **15 vibrissae** (each one cut in 20 segments providing 300 values) showed $\delta^{13}\text{C}$ values between -15.76‰ and -14.15 ‰ obtaining a mean of -14.96‰, while $\delta^{15}\text{N}$ had values between 18.63‰ and 20.53‰ and a mean of 19.58‰. Both ratios showed standard deviations of 0.80 and 0.95, respectively (Table 1).

Table 1. Descriptive statistics of $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ of vibrissae from subadult male *Zalophus californianus*.

	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)
MEAN	-14.96	19.58
VAR	0.65	0.90
SD	0.80	0.95
MAX VALUE	-14.15	20.53
MIN VALUE	-15.76	18.63

These findings in vibrissae provide evidence of interannual feeding patterns of individuals, as shown in Figure 1, based on the growth rate described for this species (Rosas-Hernández *et al.*, 2018).

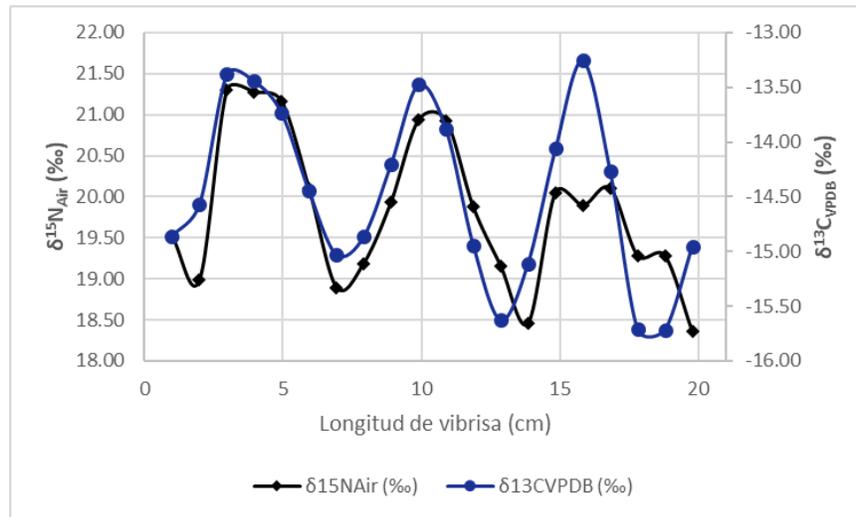


Figure 1. Isotopic profile in the vibrissae of a subadult male California sea lion.

Hair samples (N = 60) strengthened the vibrissae results, observing interindividual variability and thus delimiting the isotopic niche of subadult males. Mean hair values were -15.66‰ $\delta^{13}\text{C}$ and 18.68‰ $\delta^{15}\text{N}$ with a standard deviation of 0.32 and 0.60, respectively. The $\delta^{13}\text{C}$ values had maximum values of -15.34‰ and minimum values of -15.97‰, while the $\delta^{15}\text{N}$ had a maximum value of 19.28‰ and a minimum of 18.08‰ (Table 2). These data were just received, and their analysis are still in process.

Table 2. Descriptive statistics of $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ of hair from subadult male *Zalophus californianus*.

	$\delta^{13}\text{C} (\text{‰})$	$\delta^{15}\text{N} (\text{‰})$
MEAN	-15.66	18.68
VAR	0.09	0.35
SD	0.32	0.60
MAX VALUE	-15.34	19.28
MIN VALUE	-15.97	18.08

LITERATURE CITED

- Amador-Capitanachi, M. J., Moreno-Sánchez, X. G., Ventura-Domínguez, P. D., Juárez-Ruiz, A., González-Rodríguez, E., Gálvez, C., Norris, T., Elorriaga-Verplancken, F. R. 2020. Ecological implications of unprecedented warm water anomalies on interannual prey preferences and foraging areas of Guadalupe fur seals. *Marine Mammal Science*. 36 (4): 1254-1270.
- Rosas-Hernández, M. P., Hernández-Camacho, C. J., González-Rodríguez, E., Auriolles-Gamboa, D. 2018. Vibrissa growth rate in California sea lions based on environmental and isotopic oscillations. *PLOS ONE*. 13 (10): e0204641. DOI: <https://doi.org/10.1371/journal.pone.0204641>