

High Mercury levels: are Arctic seals “what” or “where” they eat?

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Introduction:

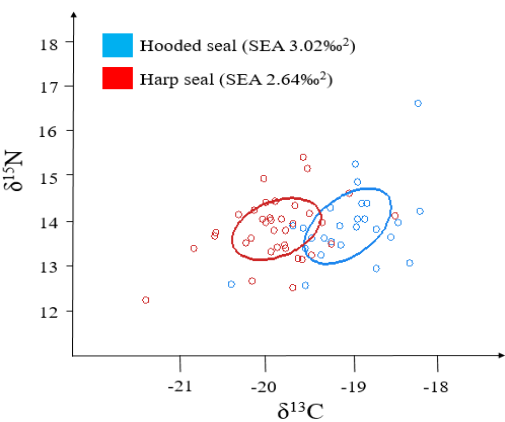
In contrast to other regions of the world or even sympatric terrestrial species, Arctic marine predators continue to accumulate increasing levels of Mercury (Hg) in their tissues. Hg bioaccumulation in Arctic seals may be linked to their particular life style, or to their extreme physiological adaptations, such as a short period of lactation with very fatty milk.



Objective:

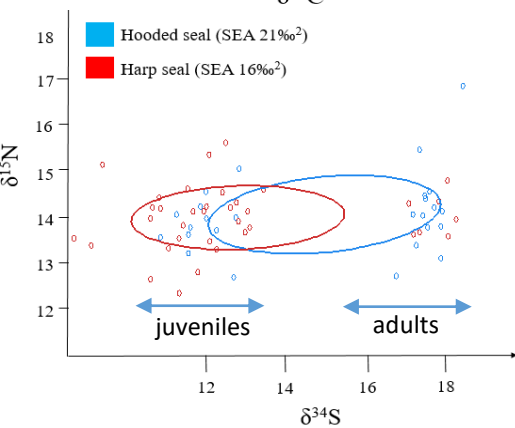
Assess how dietary resources and hunting distribution influence Hg exposure in Arctic true seals, through the integration of isotopic tracers with Hg species-specific profile

Results and Discussion



δ¹⁵N-δ¹³C isospace

- Cc-SEA was larger than that of in 69% of model runs;
 - No overlap (22%).
- This may be due to:**
- Cc wide migrations to warmer sub-Arctic waters compared to Pg that have an exclusively Arctic distribution;
 - Cc hunt for a variety of benthic-pelagic prey (e.g., halibut, redfish, cod and squid) in deep waters (1000m);
 - Pg feed mostly on pelagic schooling fish between 100 and 400m of depth.



δ¹⁵N-δ³⁴S isospace

- Cc-SEA was larger than that of Pg in 85% of model runs;
 - 52% ellipses overlap: two distinct groups along the δ³⁴S axis: the most ³⁴S enriched group: adult individuals, the ³⁴S depleted group: juveniles.
- This may be due to:**
- The shallower hunting behavior of juvenile seals and their reliance on ice food webs.

Conclusions on T-Hg accumulation patterns:

The larger migratory patterns and deep feeding behavior of Cc seem to determine significantly higher levels of T-Hg levels in this species (**3.2±3.6 μg g⁻¹**) with respect to Pg (**1.7±0.9 μg g⁻¹**; U = 322, P = 0.01) as a consequence of (1) the higher number of Hg sources in sub-Arctic waters and (2) Hg remobilization from the sea bottom and its uptake by benthic food webs.

