

Organochlorine contaminants and heavy metals in skin biopsies of the Critically Endangered Common Bottlenose Dolphin *Tursiops truncatus* Gulf of Ambracia subpopulation



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Study area: Gulf of Ambracia (NW Greece)

Identified by ACCOBAMS as an Area of special conservation importance for cetaceans.

Defined as an Important Marine Mammal Area (IMMA) of the Mediterranean Sea.

Semi-enclosed geography, agricultural runoffs containing chemical pesticides and fertilizers, intensive fish farming, and discharges of domestic sewage degrade water quality [1].

The Ambracian Common Bottlenose Dolphin subpopulation



The Gulf hosts one of the highest densities of **Common Bottlenose Dolphins** in the Mediterranean Sea (0.37 animals/km²).

Assessed as CR in 2021, the subpopulation is facing a high risk of local extinction because of:

- high site fidelity year-round, forming a geographically and genetically differentiated population (±150 individuals);
- decline of 1.6% annually over a 10-years period;
- exposure to high levels of pollution [2].



Methods

Skin biopsy sampling

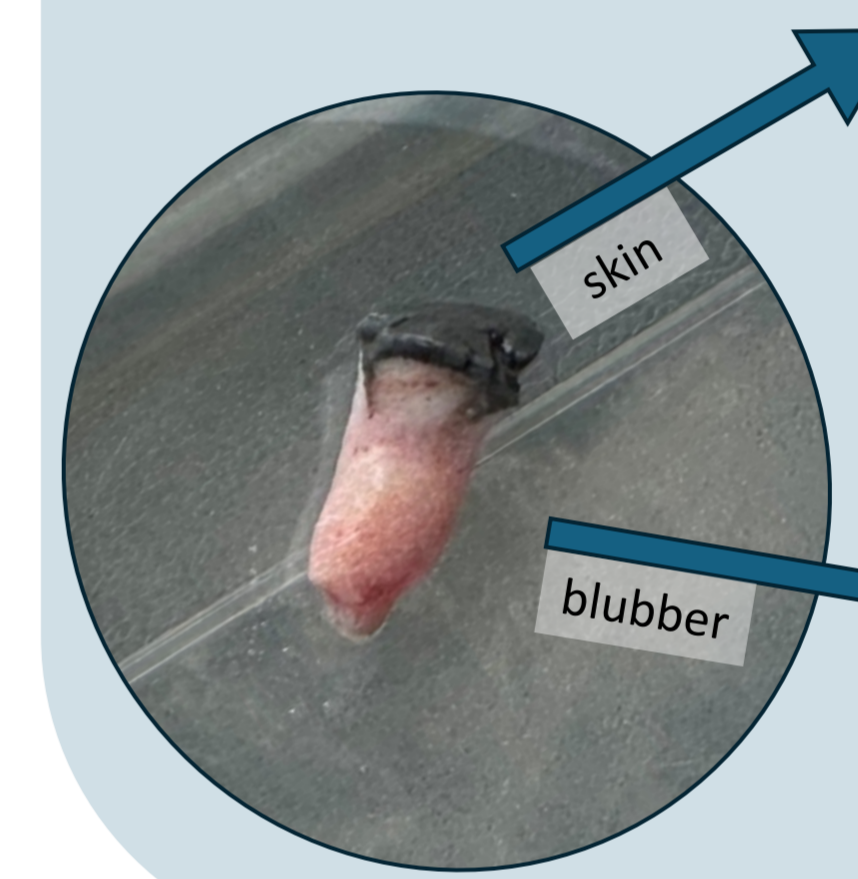
- Non-lethal technique for ecotoxicological analysis
- 7 freeranging specimens sampled
- 1 dead neonate (7TOX)



Data from the photoidentification catalogue allows to identify each animal, assess the minimum estimated age and gain information about pregnancies.

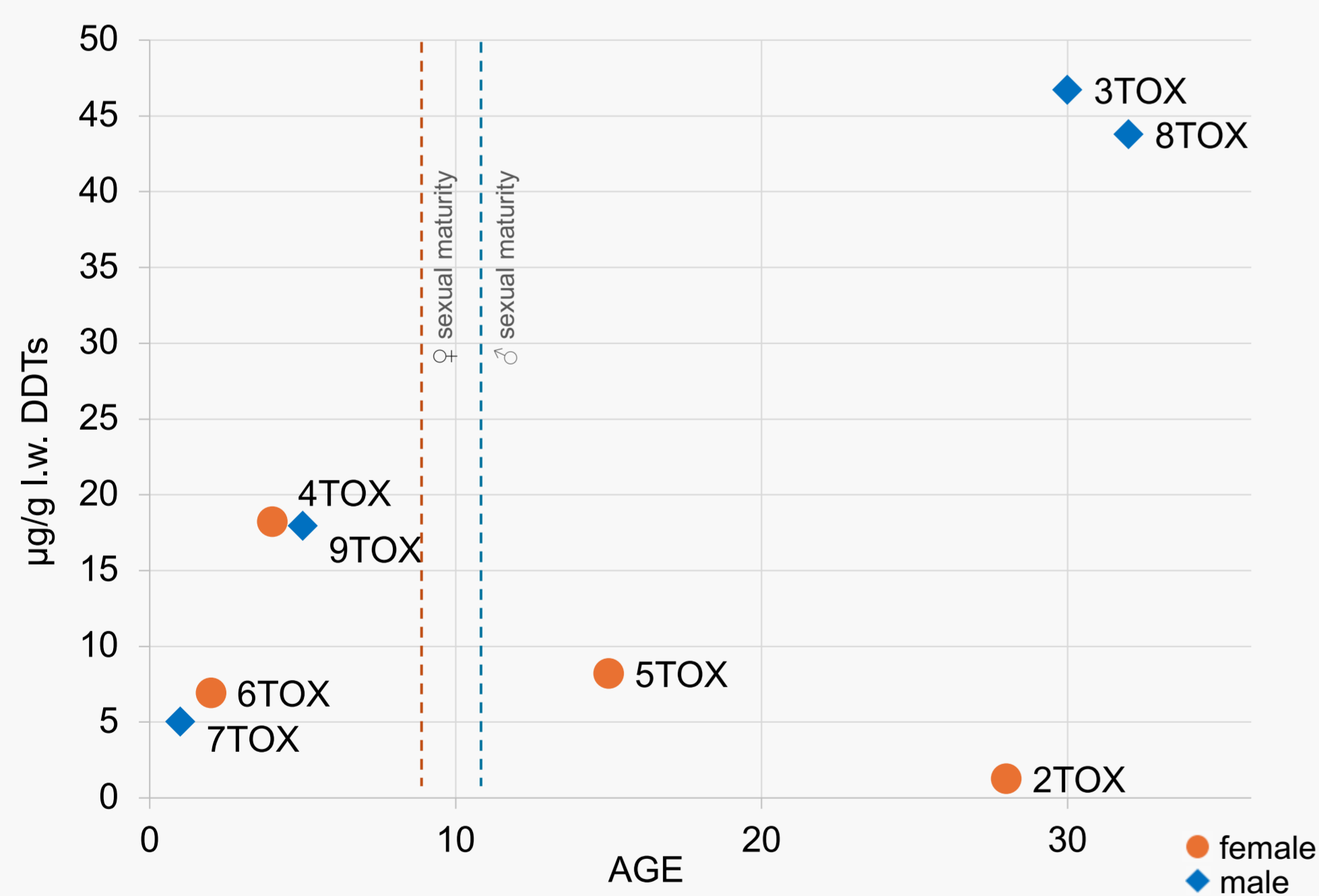
Sex determination following Berube & Palsbøll (1996) [3]

Heavy metal analysis Copper (Cu), Mercury (Hg), Cadmium (Cd), Lead (Pb), following Ancora et al. (2020) [4]



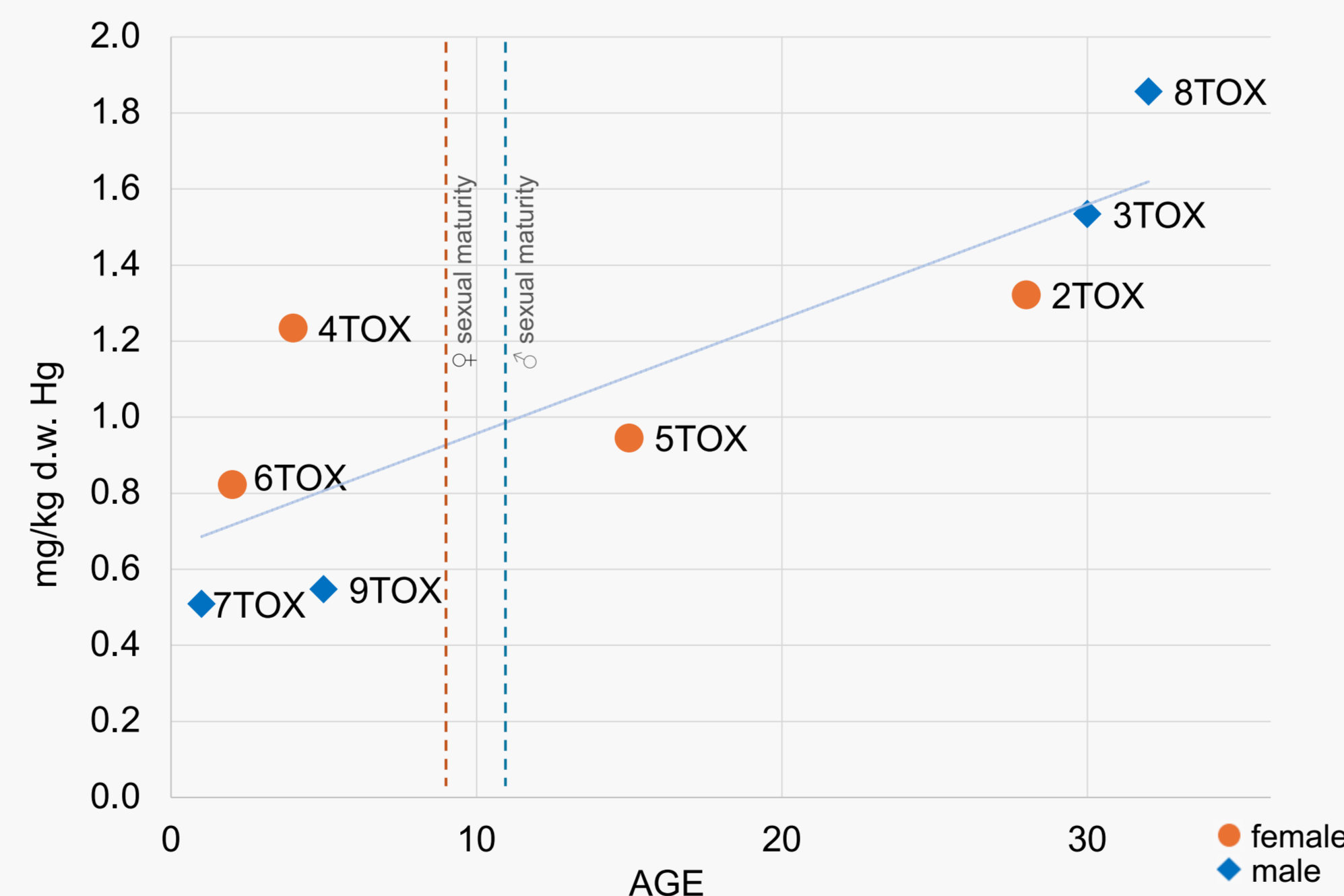
OCs analysis HCB, DDTs, PCBs, following Marsili et al., 2016 [5]

DDTs



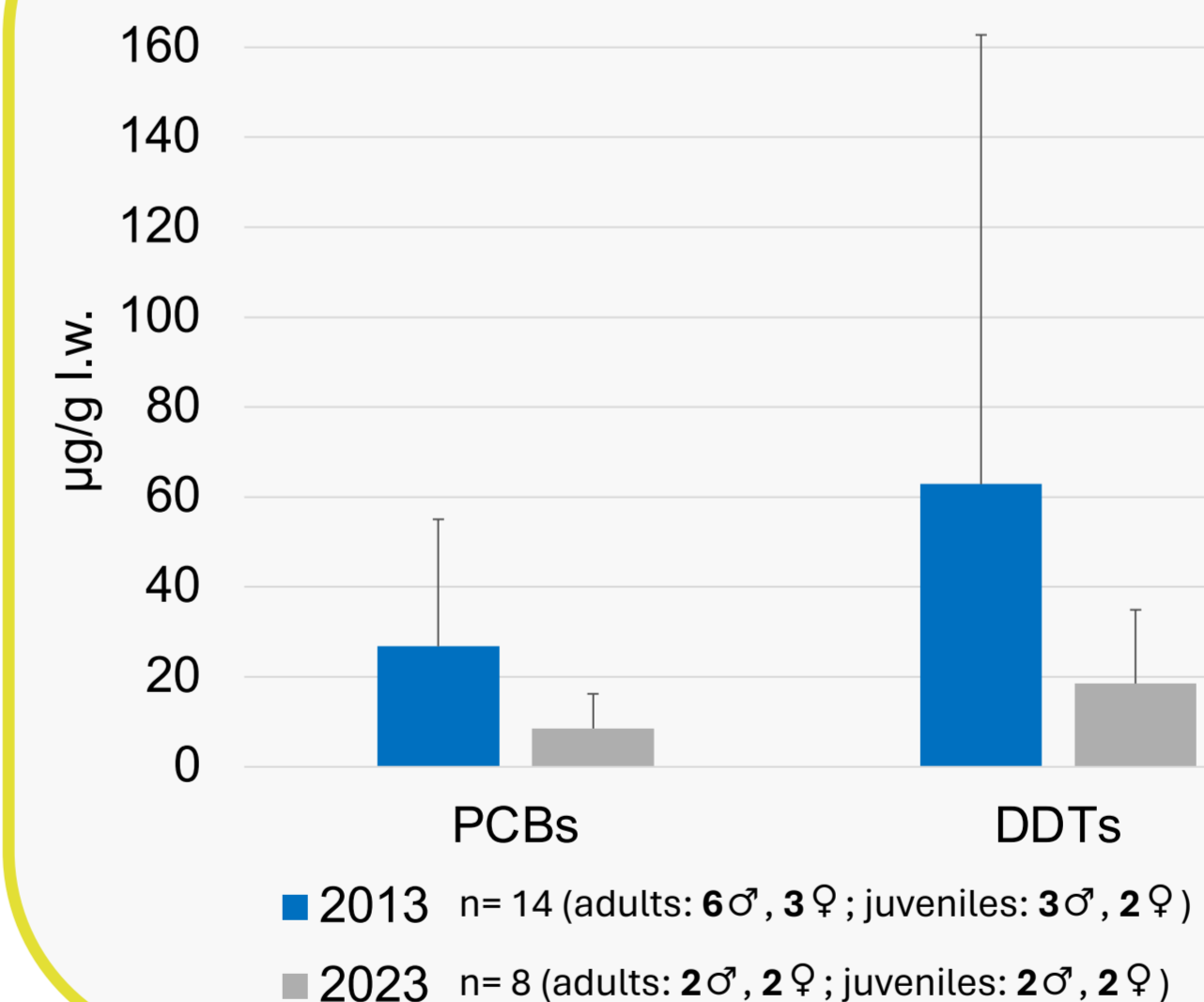
Immature individuals displayed intermediate levels, while adult males harbored the highest concentrations showing a progressive DDT bioaccumulation and biomagnification. Adult females showed the lowest levels supporting the hypothesis of maternal offloading through gestation and lactation (based on photo-id monitoring, at least 4 pregnancies – 2TOX ; 1 pregnancy – 5TOX).

Hg



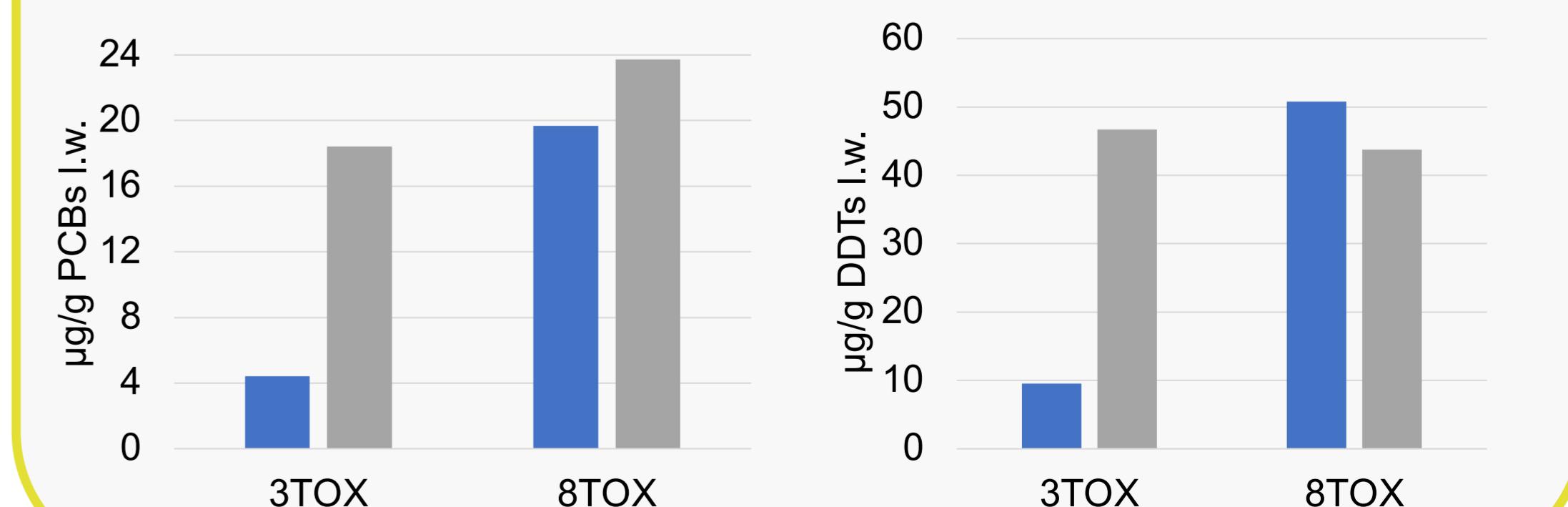
Analysis revealed a statistically significant positive correlation ($p < 0.05$) between mercury (Hg) concentrations and individual age (1 to 33 years), indicating a gradual bioaccumulation of the heavy metal over the lifespan, regardless of sex.

10 years apart



By comparing our findings with those reported by Gonzalvo et al. (2016) [6] it's clear that mean levels of OCs have declined showing a downward trend.

The random resampling of two adults males (3TOX; 8TOX) provided data on the evolution of contamination levels overtime: bioaccumulation in 3TOX and a «plateau» in 8TOX.



THE 2024 SAMPLING CAMPAIGN COULD REVEAL MORE INTERESTING RESULTS