

FINAL REPORT. Assessing feeding ecology and mercury concentrations in four delphinid species in La Guajira to evaluate contamination in the northern portion of the Colombian Caribbean

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The effort to study small cetaceans in the Colombian Caribbean is limited. Similarly, little is known about the ecotoxicological status of delphinid populations in Colombia and the Caribbean. Particularly in La Guajira (northern portion of the Colombian Caribbean), several cetacean species have been reported as transient. However, this area has been impacted by port construction and mining activities. Baseline information about the ecotoxicological status of small delphinids, as top predators, could be the key for conservation of marine habitats in La Guajira. Here, we present a first approach to mercury (Hg) concentrations and the diet of four delphinid species in La Guajira. In total, 29 samples were collected from wild dolphins using the PAXARMS system. Skin samples were analyzed to determine total-Hg using an advanced mercury analyzer (AMA-254). Foraging ecology was also assessed by analyzing $\delta^{15}\text{N}$ stable isotopes (reflecting trophic level) and $\delta^{13}\text{C}$ (reflecting foraging habitats), using an isotopic mass spectrometer. Mercury analyses showed total-Hg concentrations for all species analyzed, including the common dolphin *Delphinus* sp. (mean = $2,481 \pm 462$ ng/g dw; n = 9), Atlantic spotted dolphin *Stenella frontalis* (mean = $4,023 \pm 1,131$ ng/g dw; n = 8), spinner dolphin *S. longirostris* (mean = $4,249 \pm 916$ ng/g dw; n = 2), rough-toothed dolphin *Steno bredanensis* (mean = $16,817 \pm 3,815$ ng/g; n=3), and bottlenose dolphin *Tursiops truncatus* (mean = $5,526 \pm 3,209$ ng g⁻¹ dw; n = 7). Regarding isotopic analyses, all four dolphin species in La Guajira showed pelagic habits (mean $\delta^{13}\text{C}$ *Delphinus* sp. = $-16.37 \pm 0.53\text{‰}$; mean $\delta^{13}\text{C}$ *S. frontalis* = $-15.91 \pm 0.97\text{‰}$; mean $\delta^{13}\text{C}$ *S. longirostris* = $-16.01 \pm 0.53\text{‰}$; mean $\delta^{13}\text{C}$ *S. bredanensis* = $-14.71 \pm 0.17\text{‰}$; and mean $\delta^{13}\text{C}$ *T. truncatus* = $-15.71 \pm 0.41\text{‰}$), feeding on high trophic level prey (mean $\delta^{15}\text{N}$ *Delphinus* sp. = $11.36 \pm 0.82\text{‰}$; mean $\delta^{15}\text{N}$ *S. frontalis* = $11.68 \pm 1.09\text{‰}$; mean $\delta^{15}\text{N}$ *S. longirostris* = $12.16 \pm 0.38\text{‰}$; and mean $\delta^{15}\text{N}$ *S. bredanensis* = $12.76 \pm 0.14\text{‰}$). Mercury concentrations reported here are higher than reported in skin samples of other delphinid species in the Mediterranean, where some cetacean species have been negatively affected by pollution, so they are considered threatened by IUCN, such as *T. truncatus*. La Guajira has been suggested as an important transit and feeding area for dolphins, so these findings bring concerns about the pollution status of fish in Caribbean waters, considering that dolphins are top predators in this region, and that they consume same preys than local people, which have a strong artisanal fishing tradition. Preliminary findings of dolphin potential prey, which are also consumed by local community, showed presence of total-Hg concentrations in muscle and liver of snapper fish *Lutjanus* sp. (mean muscle = 276 ± 160 ng/g dw; mean liver = 242 ± 97 ng/g ; n = 8). This situation calls for continue monitoring the pollutant levels in fish and dolphins in La Guajira to evaluate potential effects of pollution exposure in top predators. I am indebted to the Society for Marine Mammalogy, Universidad de los Andes, the Rufford Foundation, and the Corporation Center of Excellence in Marine Sciences – CEMarin for funding this study. Preliminary results of this research were presented as a talk and a poster during the XVIII Seminario Nacional de Ciencias y Tecnologías del Mar SENALMAR and the SETAC Latin America 13th Biennial Meeting, respectively.