

Nontargeted Screening of Halogenated Organic Compounds in Bottlenose Dolphins (*Tursiops truncatus*) from Rio de Janeiro, Brazil

Mariana B. Alonso^{1,2,3,4}, Keith A. Maruya², Nathan G. Dodder^{1,5}, José Lailson-Brito, Jr.³, Alexandre Azevedo³, Elitieri Santos-Neto³, Joao P. M. Torres⁴, Olaf Malm⁴, Eunha Hoh¹

¹Graduate School of Public Health, San Diego State University, San Diego, CA

²Southern California Coastal Water Research Project, Costa Mesa, CA

³Aquatic Mammals and Bioindicator Laboratory, School of Oceanography, Rio de Janeiro State University, Rio de Janeiro, Brazil

⁴Radioisotopes Laboratory Eduardo Penna Franca, Biophysics Institute Carlos Chagas Filho, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil

⁵San Diego State University Research Foundation, San Diego, CA

ABSTRACT

To catalog the diversity and abundance of halogenated organic compounds (HOCs) accumulating in high trophic marine species from the southwestern Atlantic Ocean, tissue from bottlenose dolphins (*Tursiops truncatus*) stranded or incidentally captured along the coast of Rio de Janeiro, Brazil, were analyzed by a nontargeted approach based on GCXGC/TOF-MS. A total of 158 individual HOCs from 32 different structural classes were detected in the blubber of 4 adult male *T. truncatus*. Nearly 90% of the detected compounds are not routinely monitored in the environment. DDT-related and mirex/dechlorane-related compounds were the most abundant classes of anthropogenic origin. Methoxy-brominated diphenyl ethers (MeO-BDEs) and chlorinated methyl- and dimethyl bipyrroles (MBPs and DMBPs) were the most abundant natural products. Reported for the first time in southwestern Atlantic cetaceans and in contrast to North American marine mammals, chlorinated MBPs and DMBPs were more abundant than their brominated and/or mixed halogenated counterparts. HOC profiles in coastal *T. truncatus* from Brazil and California revealed a distinct difference, with a higher abundance of MeO-BDEs, mirex/dechloranes and chlorinated bipyrroles in the Brazilian dolphins. Thirty-six percent of the detected HOCs had an unknown structure. These results suggest broad geographical differences in the patterns of bioaccumulative chemicals found in the marine environment and indicate the need to develop more complete catalogs of HOCs from various marine environments.

Due to distribution restrictions, the full-text version of this article is available by request only.

Please contact pubrequest@sccwrp.org to request a copy.