Human-made wetlands have an important value as alternative feeding sites for birds such as Slender-billed Gull (Ramírez et al. 2012). Image courtesy of Carlos Gutiérrez Expósito.

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THE FEATURE PAPER:


This paper is an example of the potential of stable isotopes of mercury to value-add to traditional C and N isotopes to trace important processes in the field. Mass-independent fractionation of mercury isotopes associated with photodegradation can impart unique Hg isotopic fingerprints on certain food sources and habitats that are retained in highly mobile organisms. In addition to understanding the sources and fate of this toxic metal in ecosystems, as analytical challenges are overcome this tracer could become a standard part of the isotope tool kit for more general trophic studies with broad potential application.

Abstract

We combined N, C, and Hg stable isotope measurements to identify the most important factors that influence MeHg accumulation in fish from the northern Gulf of Mexico (nGOM), and to determine if coastal species residing in the Mississippi River (MR) plume and migratory oceanic species derive their MeHg from the same, or different, sources. In six coastal species and two oceanic species (blackfin and yellowfin tuna), trophic position as measured by $\delta^{15}$N explained most of the variance in $\log[\text{MeHg}]$ ($r^2 \sim 0.8$), but coastal species and tuna fell along distinct, nearly parallel lines with significantly different intercepts. The tuna also had significantly higher $\delta^{202}$Hg (0.2-0.5‰) and $\Delta^{201}$Hg (~1.5‰) than the coastal fish ($\delta^{202}$Hg = 0 to -1.0‰; $\Delta^{201}$Hg ~0.4‰). The observations can be best explained by largely disconnected food webs rooted in different baseline $\delta^{15}$N signatures (MR-plume vs oceanic) and isotopically distinct MeHg sources, with oceanic MeHg having undergone substantial photodegradation (~50%) before entering the base of the food web. Given the MR’s large, productive footprint in the nGOM and the potential for exporting prey and MeHg to the adjacent oligotrophic GOM, the disconnected food webs and different MeHg sources are consistent with recent evidence in other systems of important oceanic MeHg sources.
WHAT’S NEW IN STABLE ISOTOPE ECOLOGY?

The following list cites recently published papers that use and/or apply stable isotopes from internationally-recognized peer-reviewed publishers. Our focus is on those related to trophic ecology and food webs, animal movements and migration, contaminant tracing, and other technical aspects and implications for ecological studies.

BRITISH ECOLOGICAL SOCIETY (BES)


ECOLOGICAL SOCIETY OF AMERICA (ESA)


**PUBLIC LIBRARY OF SCIENCE (PLOS)**


Sept-Dec 2012, Bulletin of the SINLAB 1(3)


Ouyang, F., Men, X., Yang, B., Su, J., Zhang, Y., Zhao, Z., and Ge, F. 2012. **Maize benefits the predatory beetle, Propylea japonica (Thunberg), to provide potential to enhance biological control for aphids in cotton.** *PLoS ONE* 7(9): e44379. doi: 10.1371/journal.pone.0044379


