

Stable isotope measurements can assist in the traceability of products derived from crocodiles

Julián Gamboa-Delgado¹, Paulino Ponce-Campos^{*2}, Sandra G. Pérez-Martínez¹, Juan M. Pacheco-Vega³, David Villarreal-Cavazos¹

¹Programa Maricultura, Departamento de Ecología, Facultad de Ciencias Biológicas, Universidad Autónoma de Nuevo León. San Nicolás de los Garza, Nuevo León, México
(julian.gamboadlg@uanl.edu.mx, sandraptz18@gmail.com, david.villarrealcv@uanl.edu.mx)

²Bosque Tropical, Investigación para la Conservación de la Naturaleza, Misión San Antonio, Torre 4a-2. Colonia Plaza Guadalupe, Zapopan, Jalisco, México (poncecp@hotmail.com)

³Escuela Nacional de Ingeniería Pesquera, Universidad Autónoma de Nayarit. Nayarit, México.
(pachecovjm@yahoo.com.mx)

Abstract: One fifth of reptile species are currently threatened with extinction due to poaching, trafficking, and habitat loss. Crocodilian species are predators playing crucial ecological roles in their respective niches and are also endangered since several products derived from these reptiles have important commercial value. The present study examined the application of dual stable isotope analysis as a tool to identify the origin of skin and meat derived from wild and farmed crocodiles. Scutes and muscle samples were obtained from wild and farmed crocodiles *Crocodylus acutus* (n=14) and *C. moreletii* (n=9). The isotopic values in sampled scutes were significantly different between wild and farmed organisms, and $\delta^{15}\text{N}$ values showed higher differences than $\delta^{13}\text{C}$ values between both groups of animals. When both values were integrated under a discriminant analysis, a significant difference was observed, hence indicating the dual isotopic values can be effectively used as a tool to support traceability protocols designed to identify the origin of crocodile skins. Two specimens of *C. acutus* were maintained under controlled dietary conditions to obtain an indicator of the turnover rate of carbon and nitrogen in scutes. Different tissues were also sampled as a mean to obtain reference isotopic values, in particular for skin and muscle. The tissues and organs analyzed from these two individuals showed decreasing $\delta^{13}\text{C}$ values as follows: liver > dermis > scutes > heart > intestine > blood > muscle. For $\delta^{15}\text{N}$ values, the corresponding order was dermis > liver > muscle > blood > heart > scutes > intestine.

Keywords: Vulnerable reptiles, Crocodiles, Stable isotopes, Biomarkers, Traceability, Wildlife

Type of presentation: Poster

Thematic area: Socio-economic issues (Industry and International trade)