“Color Change in Crocodylians: A Response to Environmental Conditions”

Abstract:

Many species alter skin color to varying degrees and by different mechanisms. Here, we show that some crocodylians modify skin coloration in response to changing light and environmental conditions. Members of the genus Crocodylus transitioned from dark enclosures, lightened substantially when placed in white enclosures. The Gavialids showed an opposite response, lightening under darker conditions, while Alligatorids showed no changes. Observed color changes were rapid and reversible, occurring within 60-90 minutes. The response is optically-mediated and modulated by serum α-melanocyte-stimulating hormone (α-MSH), resulting in redistribution of melanocytes within melanophores. Injection of crocodiles with α-MSH caused the skin to lighten. These results represent a novel description of color change in crocodylians, and have important phylogenetic implications. The data support the inclusion of the Malay gharial in the Family Gavialidae, and the shift of the slender-snout crocodile from the genus Crocodylus to the monophyletic genus Mecistops.