

## Identifying Stomach Parasitemia in Three New World Crocodilians

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*Female Crocodylus acutus in Belize.*

Since 2008, I have been investigating the effects of parasites on the American Crocodile (*Crocodylus acutus*) and the Morelet's Crocodile (*Crocodylus moreletii*) in Belize. Crocodilian populations around the world face population declines and extinction due to climate change, habitat loss, and increasing environmental pollution. Continual stress to survive in a rapidly changing environment is negatively affecting their physiology and immunity and increasing their susceptibility to parasites due to factors altering the host-parasite relationship. This cascade of events has resulted in epidemic mortality of crocodilian species, pushing them to the brink of extinction.

This past summer, I analyzed helminth parasitism in 12 crocodiles between two and nine feet in length via stomach flushing. Helminths are parasitic worms that live inside the host, often causing weakness or disease. The crocodiles I assessed had either been recently relocated to the American Crocodile Education Sanctuary (ACES), or were crocodiles our field team captured in the wild along rivers or lagoons. We captured crocodiles using a noose or a crocodile trap created by ACES. After securing the crocodile's snout with a double noose, I would grip the head and mouth so the jaws could be taped by another team member. We would then restrain the crocodile on a wooden plank and place a vinyl tube down the crocodile's esophagus all the way to its stomach. Pressurized water would be introduced into the tube and then my colleagues and I would massage the crocodile's stomach. The crocodile would then be tipped forward and all its stomach contents would be caught in a strainer for later analysis in the laboratory.



*Left: Christina Marisa Tellez (right) and a team member (left) performing a health assessment on a seven-foot Crocodylus acutus. Right: Team members preparing to flush the stomach of a Crocodylus acutus.*

An interesting observation of our study was the low parasite prevalence in these crocodiles. Out of 12 crocodiles, only four showed signs of stomach parasites, and these four contained very few parasites. The parasitized crocodiles were between six and nine feet in length. The diet of crocodiles of this size consists mainly of fish, blue crabs, and medium-sized mammals, thus there is an abundance of prey that could serve as intermediate hosts for the parasites. It is generally hypothesized that the larger the animal, the more parasites it can harbor. The lack of parasitemia in the crocodiles we sampled indicates possible environmental perturbation. Many studies have shown that heavy metals or chemical effluent can hinder parasite transmission, thus parasites can be used as bioindicators of the stability of the environment and the health of the host. Further investigation is needed to understand the lack of parasitemia in the crocodiles in Belize and its correlation to ecosystem perturbation.



Left: *Crocodylus moreletii* in Belize. Right: Preparing for a dissection at the American Crocodile Education Sanctuary to determine if parasites had prevented a *Crocodylus acutus* egg clutch from hatching.

In addition to continuing my research in Belize, I plan to collect samples with collaborators in southern Mexico from three crocodylian species: *Crocodylus acutus*, *Crocodylus moreletii*, and the Spectacled Caiman (*Caiman crocodylus crocodiles*). I anticipate my research will assist biologists and government wildlife agencies in distinguishing the detrimental factors affecting particular crocodylian populations that would otherwise go undetected. These studies may also provide valuable information about other species living in the same ecosystem.



Christina Marisa Tellez photographing two wild *Crocodylus acutus* on Ambergris Caye, Belize.