

WONDERFUL WORLD OF CROCODILIANS!

Crocodilians are one of the oldest lineages of wildlife on earth, descended from Archosaurs about ~240 million years ago. Over evolutionary time, they have developed some unique adaptations that has allowed them to survive various climatic changes and mass extinctions in which other organisms have gone extinct. So get ready to get a load of croc on some basic facts in the wonderful world of crocodilians!

- There are currently 28 species of crocodilians in the world. Interestingly, the ancient Egyptians KNEW there were 2 different species of Nile crocodiles, but European colonists ignored the subtle differences the Egyptians saw and clumped the two species into one. It wasn't until 2011 that the 2 species were "re-discovered" thanks to genetics!



- Given the results of genetics, new cryptic species of crocodilians are being discovered, and many will be considered Endangered or Critically Endangered immediately given threats of habitat loss, pollution, or illegal hunting
- What is the crocodile's closest living relative- BIRDS!!!! When you look at the genetics, physiology, morphology, parasitology, and immunology, the science supports that crocodiles and birds are each other's closest living relatives, both descending from Archosaurs.
- Crocodile vocalization starts in the egg. Hatchlings chirp inside the egg to coordinate hatching, and alert the mother to dig them out. Mother will then transport hatchlings in her jaw to the water's edge.
- Distress calls produced by juvenile crocodiles alerts crocodiles in the vicinity to come to their aid.

General Anatomy....

- Crocs have 5 front toes, and 4 back toes on their feet.
- Crocs swim by the propulsion of their tail. Their tail is very strong and will be used for defense during fights.
- The crocodile's anatomy is built for spending most of the time in water, not on land. However, they can walk on land (Morelet's crocodiles are known to travel great distances to new bodies of water) and have been recorded launching at 11mph!
- The crocodile ear canal is connected across the skull granting them excellent directional hearing, and a hearing range comparable to mammals and birds.
- The crocodile eardrum is protected by a muscular flap that can open and close.
- Crocodiles have a "third" eyelid called the nictating membrane. It covers the eye of the crocodile while submerged underwater to protect its eyes, and possibly giving the crocodile some vision to maneuver under water.
- Although crocodilian vision is worse than humans, the crocodilian eye is a striking adaptation for their lifestyle: maximum clarity all along the visual horizon (or water's edge or shoreline). This is because the fovea inside the retina of the eye is a horizontal streak instead of a round spot (like most mammals), which allows crocodilians to scan shoreline without moving their head, increasing their stealth and camouflage in approaching prey.
- Crocodiles have dots on the ventral side of their body known as Integumentary Sensory Organs (ISOs). ISOs can detect changes in pH, salinity, and movement in the water, which likely helps crocs predate while submerged under water.
- Crocodiles have a reflective membrane inside of their eye, the retinal *tapetum lucidum*, which gives them excellent night vision, and gives off the red-eyeshine during nocturnal surveys.
- Crocodiles have the strongest bite force in the world: 3,000-5,000 lbs/sq²!
- After Komodo Dragons, crocodilians have the strongest innate immune system in the world.



- Crocodilians regulate body temperature by basking in the sun. Their mouths are kept open to keep the brain from overheating, while the rest of their body heats up.
- Crocodilians have a 4 -chambered heart, similar to mammals. Interestingly, their heart can “change” into a 3-chamber heart when the Crocodilians dive due to the Foramen of Panizza. This interconnecting piece unique in Crocodilians allows the mixing of blood, which can be advantageous for a diving reptile. It is this unique aperture that allows crocodilians to hold their breath for long periods of time.
- Osteoderms, which are the keeled scales on the back of crocodilians, have 2 functions: 1) protection (it’s their own armor), and 2) heat absorption.
- Do you like parasites? Probably not, but crocodilians LOVE having parasites! For one, stomach parasites of crocodilians help break down prey in the crocs stomach (with their venom! Yes, nematode parasites have venom!). Secondly, parasites absorb heavy metal toxins crocodilians accumulate alleviating crocs from heavy metal toxicity! And three, parasites likely help strengthen the immune system of crocodilians (they have the second strongest immune system after Komodo Dragons). The healthier the croc or alligator, the more parasites it has and they love it!



Above information was provided by **Crocodile Research Coalition**
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