

Green Anaconda
Eunectes murinus

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Introduction

The green anaconda is a predominantly aquatic snake that inhabits the wet tropical regions of South America. It is notorious for its large size and astounding capabilities as a formidable predator. Also called water boas, green anacondas are arguably the largest snakes in the world: although the reticulated python is longer, the anaconda out competes it on the basis of girth and sheer mass (Murphy, 1997). Mature females can reach up to 32 feet in length and weigh up to 550 lbs, while the males grow up to 20 feet long and weigh around 235 lbs (Pinney, 1991). The systematics of the green anaconda is as follows (Murphy, 1997):

Kingdom Animalia
Phylum Chordata
Class Reptilia
Order Squamata
Suborder Serpentes
Family Boidae
Subfamily Boinae
Genus *Eunectes*
Species *murinus*

There are four species of anaconda: *E. beniensis*, *E. deschauenseei*, *E. murinus* and *E. notaeus*. The most researched and well known of these is the *Eunectes murinus*, or the green anaconda. The other species include the yellow anaconda, the Deschauense's anaconda, and the Barbour's anaconda (Pinney, 1991). Like other snakes, anacondas are most likely derived from lizard ancestors: they contain traces of pelvic and hind limbs (Pinney, 1991). However, unlike more advanced snakes that have one elongated lung, anacondas have two functioning lungs (Pinney, 1991). It is possible that anacondas diverged from ancient boa constrictors due to competition of food sources during the Pleistocene era (Murphy, 1997). Although much of the biology and behavior of the

anaconda is unknown, it still remains one of the most elusive and magnificent creatures in the animal kingdom.

Habitat and Range

Eunectes murinus often dwells in the marshes, lakes, and rivers in South America, particularly around the Amazon, Orinoco, Parana and Uruguay river basins, ranging all the way from Venezuela to as far down as northern Argentina (Thorbjarnarson, 1995). In areas of Venezuela and Columbia, they also inhabit the treeless prairies – called *llanos* – that become flooded during certain parts of the year (Rivas, 2001). During the dry seasons, *E. murinus* has been seen to use caves under the tree roots lining the riverbanks as shelter (Thorbjarnarson, 1995). Completely solitary creatures, anacondas are very cryptic in their natural habitats. Along with their green skin and oval-shaped patterns, *E. murinus* camouflages itself under the mud, muck and floating vegetation of the river water. The genus of the anaconda *Eunectes* translates as “good swimmer” – and as accordingly, anacondas are often submerged, with only its eyes and nostrils peeking out over the surface of the water (Thorbjarnarson, 1995). Anacondas normally display habitat fidelity and have well-defined home ranges that only vary slightly during different times of the year (Thorbjarnarson, 1995).

Physical Features as Adaptations for Predation

Possibly one of the best ways to discuss the physical features of *Eunectes murinus* is to illustrate them in the context of what anacondas were evolutionarily designed to do: kill prey. As part of the boa constrictor family, anacondas subdue their prey by coiling their large, powerful bodies around their victims and constricting, or squeezing, them until the prey suffocates. As a predator, the design of the anaconda is artful: the skull

bones are held loosely by muscle and skin, and the lower jaw is not fused to the upper jaw and is surrounded by massive muscles, thereby giving the anaconda an extremely powerful bite as well as the ability to swallow large prey bigger than the diameter of its mouth. The skin around the mouth is also very thick and can stretch around the entire body of the prey. The jaws also have more than a hundred razor sharp teeth, all curved towards the back of the throat (Murphy, 1997). This prevents prey from pulling away and escaping the anaconda's grasp. It is important to note that the anaconda's teeth are not used for biting or chewing, nor are they venomous; they are simply a means for grasping and holding prey.

But the anaconda does not only use its mouth to capture prey, it uses its entire body. The numerous short vertebrae along the snake's spine create a very flexible body, allowing it to coil around the prey and constrict it. Furthermore, the anacondas rely on specialized senses to detect prey. *E. murinus* may have slightly underdeveloped vision, but it has specialized sensory organs called pit organs along their lips that sense heat from warm-blooded animals, allowing them to detect nearby prey even in the dark. Furthermore, a sensory organ called the Jacobson's organ located in the roof of the mouth reads chemical cues in the air collected by the snake's flickering forked tongue (Place, et al, 2006). While anacondas lack an external ear structure, anacondas can still detect sounds and vibrations through the ground and underwater through their sensitive skin (Pinney, 1991). As one can see, from its teeth, to its jaws, skull, muscles, spine and skin, the anaconda's physical features are intricately coordinated and specifically designed to maximize its abilities as a predator.

Feeding Habits and Diet

Green anacondas are considered to be sit and wait predators and are specialized for aquatic hunting (Rivas and Owens, 2001). The size of targeted prey is determined by the relation of the diameter of the prey to the diameter of the snake's head (Murphy, 1997). The anaconda lies submerged underwater, with only its eyes and nostrils above water (Thorbjarnarson, 1995). Sensing the prey through vibrations in the water, the anaconda waits until the prey is close enough to attack. With the prey within striking range, the anaconda bites to hold the prey, and then rapidly throws coils of its muscular body around the prey, allowing for constriction. The prey is killed by suffocation, cutting off of circulation, or by snapping of the animal's spine or neck (Murphy, 1997). *E. murinus* has also been seen to hold their prey underwater until drowning occurs (Thorbjarnarson, 1995). As discussed earlier, the anaconda does not bite or chew the prey, but rather swallows it whole: normally head first, as the head poses the largest threat to the anaconda. Anacondas typically feed on deer, pigs, birds, turtles, capybara, caiman and even jaguars (Thorbjarnarson, 1995). Depending on the large size the swallowed prey, *E. murinus* can go without feeding for several months. The low metabolic rate of the anaconda also allows it to survive long periods of time without food (Murphy, 1997). In fact, through natural selection, the anaconda has been able to survive unpredictable circumstances, such as droughts, cold spells and declines in prey populations, by not having to feed for long periods of time (Murphy, 1997). However, one motivation for successful feeding for the anaconda is sexual reproduction. Hunting for prey during mating season is important because successful feeding positively correlates with successful mating (Thorbjarnarson, 1995).

Reproductive Behavior

The mating system of the anaconda is quite interesting and complex. *Eunectes murinus* shows the largest sexual size dimorphism (SSD) of any snake: the females are much larger than the male (Rivas and Burghardt, 2001). The female anaconda secretes pheromones to attract many males (Rivas and Burghardt, 2001). During the later part of the dry season, usually in March, several males form breeding aggregations around a single female. When multiple males congregate around a solitary female, they form a “mating ball” that can include up to more than a dozen males for one female (Thorbjarnason, 2005). These mating balls can occur in shallow water and can last for weeks (Thorbjarnason, 2005). The males swarm the female, attempting to insert their hemipenes, or copulatory organs, into the female’s cloaca. The males use their tiny hind limbs, reduced from an ancient lizard ancestor, as clawed spurs to stimulate the female during mating (Rivas, 2001). Males also rub their chins on the female’s body and flick their tongues to pick up her scent in order to prepare for copulation (Murphy, 1997). A successful male will leave a waxy plug in the female’s cloaca, preventing fertilization of other male’s sperm. Once the female is pregnant, she cannot feed for the entire gestational period, which is about six to seven months (Murphy, 1997). Anacondas are oviparous: they retain their eggs until they hatch and give birth to live young (Rivas and Burghardt, 2001). The number of offspring ranges from 20 to 100 young (Pinney, 1991). *E. murinus* does not exhibit any parental care (Rivas, 2001). However, to ensure proper development of the embryos inside their body, gravid females often times bask in the sun on an island of dry habitat in order to raise their body temperature and speed up embryonic growth (Thorbjarnarson, 1995).

Mating also affects feeding: females exhibit two forms of cannibalism, in which females sometimes kill and eat smaller males after mating and also eat stillborn offspring (Rivas and Owens, 2000). Females most likely eat males to obtain as much nutrients as possible before they stop feeding, and stillborns provide nutrients for the female after her long period of fasting.

Conclusion

Today, although anacondas are not on the endangered list, human exploitation is the biggest threat to anacondas, as they are not very prone to predation in the wild. They are often displayed in zoos or are bred in captivity. Keeping an anaconda as a pet is highly discouraged, as anacondas can be more aggressive and hostile compared to a boa or python. Anaconda skins are also sometimes used as leather (Murphy, 1997). Some Amazonian tribes reportedly use anaconda fat as a folk medicine for respiratory problems (Pinney, 1991). While attacks on humans are often speculated and feared, in actuality they are extremely rare. Most of the time, *E. murinus* bites a human in self-defense or by mistake and then releases it (Rivas and Owens, 2001). Portrayal of anacondas in popular culture as vicious fiends deters further understanding of these enigmatic and misunderstood creatures, but field studies of the giant snake increase awareness and shed light on new information. *Eunectes murinus* can continue to flourish in the South American river basins as long as habitat destruction and human exploitation are kept at bay. Anacondas are giants among us and should be respected and revered as the evolutionary masterpieces that they are.

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