

# God's Miraculous Snakes!



**Rhinoscaphophis**



**Mangrove Snake**



**Tentacled Snake**

All animals were created by Father God, the Lord Jesus Christ, and the Holy Spirit  
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I give ALL of the glory to my Father God, the Lord Jesus Christ, and the Holy Spirit for the collection of books which He has written, for the illustrations, materials, and lessons - ALL of which would not have been possible without Him. He instructed me to put the copyright in my name and I have obeyed.

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Psalm 115:1

"<sup>1</sup> Not to us, LORD, not to us  
but to your name be the glory,  
because of your love and faithfulness." (NIV)

Snakes are reptiles. There are about 3,400 species of snakes in the world. They have no arms and have no legs. The regulation of body temperatures for all living creatures is called - THERMOREGULATION. Different types of animals do this in different ways, some internally and some externally. Reptiles DO NOT have the ability to internally regulate their own body temperature. They must use external sources around them to maintain their body heat, for example, direct sunlight or basking on sun heated rock surfaces. This external process means they are ECTOTHERMIC or cold-blooded. As a result, they must move from place to place to keep those warm environmental conditions going. When their bodies reach the warm temperatures that their body requires, they have the energy to hunt and digest their food. If they become cold, they become sluggish. Snakes that live in warm places are active all of the time. Others that live in changing climates – hibernate in winter.





**Brown Water Snake**

**These snakes are basking in the sun to stay warm.**



**Cotton Mouth Water Moccasin**



**A snake's eyes have no lids. They are covered with a transparent layer of skin. Each time they shed the rest of their skin, they shed this too.**

**Snakes that are active in daylight, usually have round pupils like this Black Snake.**





Some that are active at night, have an eye like a cat with a slitted pupil that gets larger in the dark, but closes in bright light. Look at the slitted eye of this Burmese Python.

Those snakes with horizontal pupils, (meaning running from side to side), like the Twig Snake shown below, have pupils that allow more light from left to right, rather than from above and below. Their pupils shield the eyes from the harsh sun. Those with horizontal pupils almost look like a key hole.



Twig Snake  
Photo courtesy  
of Johan  
Marais, African  
Snakebite  
Institute



Snake vision depends on the type of snake, whether or not it's on the alert, and its natural habitat. Snakes that hunt during the day have exceptional eyesight – like False Water Cobras. Those that live mainly underground rely more on their sense of hearing and smell, for example, Pine Snakes. Snakes CAN constrict the blood vessels in their eyes when threatened to give them slightly better vision. This is similar to a human being squinting to see better.



**False Water Cobra**



**Northern Pine Snake**



Snakes DO have a set of regular nostrils which they use to breathe, and they DO take in airborne odors, but there is also ANOTHER sensory organ called the VOMERONASAL organ. It is a group of sensory cells that are enclosed in a capsule made of cartilage that is in contact with the base of the nasal cavity. This organ notices odor laden particles and has more sensory neurons than a snake's regular nostrils. The 2 openings leading to the organ are in the snake's palate, meaning the roof of its mouth. A snake flicks its forked tongue back and forth as a behavior used to seek sensory input. When it does this, it picks up odor particles from the air or ground. The snake retracts its tongue into its mouth, and the odor particles that are contained on each side of its tongue are then transferred to the 2 ducts within the snake's palate which lead to the vomeronasal organ. Its brain very quickly processes these scents whether they come from the right or left side of its forked tongue. It determines the direction of the odor and this allows it to follow scents for mating, trailing, and attacking prey in the correct direction. Snakes also use this sensory method when eating and when choosing a shelter. The vomeronasal organ can differentiate between the sexual pheromones coming from each snake's OWN species and also the odors that come from its prey.

Some snakes, those that hunt in the dark, have a miraculously sensitive organ near each nostril - an indentation with a thin membrane covering it called a HEAT PIT. A heat pit is able to detect even the slightest changes in temperature within about 16 inches away. All warm-blooded animals radiate heat from their bodies. Remember, these warm-blooded animals are usually a snake's prey and a snake's heat pit can detect their body heat. It can detect where its prey is, the warmest part of the prey, and the best place to strike to kill it. Pit Vipers and Pythons are examples of snakes that use this method of detection.



**Cotton Mouth Water Moccasin**  
(Belonging to a group called Pit  
Vipers) This is a venomous snake.



**Green Tree Python**  
This snake squeezes its prey  
to death and is called a  
Constrictor.



**Snakes DO NOT unhinge their jaws to eat large prey. They have a flexible ligament that connects the lower and upper jaw so that it can stretch to accommodate large prey.**



**University of Cincinnati Professor Bruce Jayne, studied wild specimens captured and euthanized in Florida. Using what looks like a bucket, he is demonstrating that a Burmese Python can open its mouth VERY WIDE in order to swallow prey. Photo courtesy of Professor Bruce Jayne, University of Cincinnati used with permission.**

**This is a picture of a wild Burmese Python regurgitating (or vomiting) an adult white-tailed deer in Everglades National Park. Photo courtesy of Ian Bartoszek used with permission from Bruce Jayne.**





Snakes have beautiful scales in all kinds of different colors and patterns. Their scales ARE NOT slimy. They use their different scale patterns to blend in or CAMOUFLAGE themselves within their environments. Snakes must travel along rough terrain, so their scales are made of a tough substance called KERATIN. This is the same material human fingernails and hair are made of.



**Tan Copperhead**



**Orange and White Copperhead**



**Southern Pacific Rattlesnake**





**Florida Rough Green Snake**



**Northern Water Snake**





**California Kingsnake**



**Orange Corn Snake**



Just like all animals who have babies - snakes grow. When you grew as a child, your clothes soon became too small for you and you needed new ones. Snakes have the same problem with their skin. As they grow, when the old skin becomes too tight, they form new skin over the old skin. A layer of fluid is created between their old and new skin which keeps the old skin stretchy. It also contains hormones. Once the new skin is complete, they rub against something hard to break the old skin at their head area. They literally crawl right out of the old skin and reveal the new skin that was formed underneath. They leave the old skin behind. This whole process is called **MOLTING**.





Snakes molt for other reasons too, such as when they have been injured and need healing. They also molt when hormonal changes take place and snakes are ready to find a mate, lay eggs, or give birth. That layer of hormonal fluid between the old and new skin can be detected by a male snake and lets him know that a female is ready to mate.

Sometimes when you take a walk on a trail, you can find old snake skins that have been left behind. Amazingly, some bird species will use the old skins that snakes leave behind and weave them into their nests. Medlin & Risch of Arkansas University, have found it is used to keep predators away from the nests.





There are 3 ways that snakes give birth to their young depending on the species. 1. Oviparous, [ō-vīp-uh-rŭs] which means they lay eggs. About 70% of all snakes use this method. Males fertilize the eggs within the female's body. Rat Snakes, Grass Snakes, King Cobras, Cobras, Pythons, and Mambas are some that fall into this egg laying category. Most snakes that live in warm places usually lay about 20 to 30 eggs, but Pythons usually lay about 100 eggs! Most snakes of this type, abandon the eggs after hatching and when the babies emerge - they are on their own. The King Cobra however, builds a nest, incubates the eggs, and also stays for a while after hatching.

Below: In the Florida Everglades, Burmese Pythons have been killed in the wild. They have been autopsied and confirmed pregnancies. Look at how many eggs there are and their size! Remember, you are only seeing a portion of the actual size of the mother and her eggs.



**2. Viviparous [Vī-vĭp-uh-rŭs] snakes feed their young through an umbilical cord, placenta, or yolk sac attached to the young INTERNALLY similar to the way mammals do. Then their babies are born alive in a membrane. This live bearing method is usually characteristic of snakes that are large and powerful, venomous snakes, those whose habitat is limited (for instance an aquatic habitat), and those that are in high altitudes or climates where eggs would be at risk of the cold. Boa Constrictors and Green Anacondas are among these types of snakes. Amazingly, this method of giving birth does not limit the amount of babies born at one time. In fact, Boa Constrictors can have as many as about 65 babies.**



**Rosy Boa**



**Rosy Boa**



**3. Ovoviviparous [ō-vō-vī-vĭp-uh-rus] male snakes fertilize the eggs within the female and the developing eggs grow INTERNALLY and they also hatch INSIDE the female's body. Then the baby is born alive with no shell. The shell is reabsorbed by the mother. Rattlesnakes are among those that do this.**



**Eastern Diamondback Rattlesnake**



All snakes are predators and most have teeth, but not all. The African Egg Eating Snake has no teeth. It eats its eggs whole. In fact, teeth would actually get in the way of how it eats its food. Some snakes are venomous (meaning they can inject poisonous toxins into their prey) and some cannot. The type, arrangement, and number of teeth vary according to the particular species. There are 4 types of snake teeth:

1. Aglyphous teeth [pronounced äg-lī-fūs] – Most snakes have aglyphous teeth. These teeth are thin, long, cone shaped, and sharp. There is one row in the bottom jaw and two rows in the upper jaw. They all face backwards towards the back of the snake's mouth to prevent their prey from escaping. In some species, these teeth are not readily visible – they are hidden in the snake's gums. If a snake has ALL aglyphous teeth, then it has no fangs to deliver venom. Some types of aglyphous snakes are: Bull Snakes, Rat Snakes, North American Kingsnakes, and Boa Constrictors (because Boas squeeze their prey to death instead.)



**Bull Snake**



**Kingsnake**



**Black Rat Snake**

2. Solenoglyphous [ Sō-la-nō-glī-fūs] teeth – These are large fangs at the front of a snake's mouth. These fangs are hinged and can fold back and retract into a snake's jaw and then suddenly project out to grab prey. They are hollow so that venom can flow through them like a hypodermic needle going right into the victim's flesh. Solenoglyphus snakes - strike, inject venom, back-off, and wait for their victim to die. Examples of snakes with these type of fangs are Vipers such as Rattlesnakes.



**Southern Pacific Rattlesnake**



**Coiled Timber Rattlesnake**



3. Proteroglyphous teeth [prō-tair-ah-glī-fūs] - These fangs are also in the front of the mouth, but they cannot fold up like the solenoglyphous fangs. As a result, they are much shorter – only about one third of the size of solenoglyphous fangs. Snakes that have these fangs, just strike and hold on - injecting more and more venom. They do not release the victim. Mambas, Cobras, Coral Snakes, and Sea Snakes are just some of the snakes that are proteroglyphous.

Texas Coral Snake



King Cobra

4. **Opisthoglyphous teeth** [ŏ-pĭs-tho-glĭ-fŭs] – These fangs are located near the back of a snake's mouth. Snakes with these types of fangs - strike, then hang on, until the venom is delivered into its prey. Deadly Twig Snakes (with no anti-venom available) and deadly Boomslangs [pronounced Booim slung's] have opisthoglyphous teeth. This word spelled "Boomslang" is actually pronounced [Booim slung], it is a South Afrikaans word - "Booim" means tree and "slung" means snake.



**Twig Snake Fangs Photo courtesy of Johan Marais, African Snakebite Institute**



# What does venom do to a snake's victim?

How venom works depends on the type of snake.

1. Some venoms contain neurotoxins, meaning they are poisons that affect the nervous system. These toxins prevent neurons in the brain from sending signals to other parts of the body. This means the victim is paralyzed.
2. Hemotoxins ("hemo," meaning blood in the Latin and toxins = poisons in the blood) They affect the blood of an animal by causing its red blood cells to explode, it can cause blood clotting, and can lower the blood pressure to dangerous levels. This is very painful.
3. Myotoxins cause death to body tissues (such as muscles) called "necrosis." They also cause muscle contraction.

**The Center for Disease Control says that of the estimated 7,000 to 8,000 people who are bitten by venomous snakes in the U.S. each year, only approximately 5 die. The chances of a fatality are lower IF you act quickly. Here are some tips to help you.**



## How to Prevent Snake Bites

- Prepare in advance and LEARN about the snakes who live in the area where you live or travel to.
- Carry a cell phone in case of an emergency.
- BE CAREFUL - Areas near water sources like rivers, lakes, and streams, rock crevices, grass that's thick and tall, and hiding under debris or other objects are a snake's favorite hideouts.
- Wear sturdy high topped shoes in snake country to protect your ankles.
- Pay attention and watch where you put your feet. Snakes sometimes will sun themselves in the middle of a sunny trail.
- If you see a snake, back away from it slowly and find another way around the area. Don't touch it.
- Don't walk trails at night.
- Designated biking and walking trails are there for your protection – STICK TO THE TRAIL.
- Don't put your hands and feet into hidden areas such as: rock crevices, holes, under rocks, under a wood pile, or other debris where you can't see them.
- Pets should ALWAYS be on a leash.
- If you are in Rattlesnake country, listen for the warning sign that it gives – the sound of a rattle and get out of that area.

## **“Signs and Symptoms of Snake Bites**

- **If you are walking in high water, you may feel a bite, but not know that you were bitten by a snake. You may think it is another kind of bite or scratch. Pay attention to the following snake bite signs and symptoms.**
- **Depending on the type of snake, the signs and symptoms may include:**
- **A pair of puncture marks at the wound**
- **Redness and swelling around the bite**
- **Severe pain at the site of the bite**
- **Nausea and vomiting**
- **Labored breathing (in extreme cases, breathing may stop altogether)**
- **Disturbed vision**
- **Increased salivation and sweating**
- **Numbness or tingling around your face and/or limbs” (CDC, 2022)**



## **What You SHOULD and SHOULD NOT DO if YOU or SOMEONE ELSE is BITTEN by a SNAKE**

- **Try to remember the color and shape of the head of the snake, which can help with treatment of the snake bite. DON'T pick it up or try to catch it.**
- **Have the person sit down with the bite below the level of the heart.**
- **Keep the person who was bitten calm. This will slow down the spread of venom if the snake is poisonous.**
- **Do not wait for symptoms to show up - CALL 911 IMMEDIATELY FOR DIRECTIONS UNTIL MEDICS ARRIVE.**
- **Do not apply a tourniquet, which means using a band, cloth, or belt to cut off circulation.**
- **Do not cut the wound with a knife.**
- **Do not attempt to suck out the venom.**
- **Don't apply ice to the wound or put the wound in water.**
- **Don't drink alcohol, caffeinated beverages, or take any medications. These will speed up the venom going through the circulatory system.**
- **Remove watches and rings before swelling starts.**

**“After a natural disaster, snakes may have been forced from their natural habitats and move into areas where they would not normally be seen or expected. When you return to your home, be cautious of snakes that may have sought shelter in your home. If you see a snake in your home, immediately call the animal control agency in your county.” (CDC, 2022)**



If you need help with learning and reading God CAN help you.  
Let us pray.

Just say, Lord Jesus the Christ,  
I've made so many mistakes I must confess.  
I repent of them now and turn from them.  
I no longer want that mess.

Lord Jesus, I believe you are the Son of God  
and believe in your resurrection.  
I want to be a child of God  
and receive your love and affection.

Lord Jesus the Christ, be my Savior.  
Come into my heart.  
Cleanse me now of all unrighteousness  
and give me a brand-new start.

I ask for the baptism of the Holy Spirit  
and the baptism by Holy fire too.  
I WANT to be changed and to do the RIGHT things.  
I need help from you.

Please help me to read, write, and do my math.  
I want to start learning today.  
I want my life to take a turn  
and start in a whole new way.

Thank you Lord Jesus for helping me to learn.  
I KNOW you can help make my ability,  
greater than anyone ever imagined  
and bring back my self-respect and dignity.

I ask this in the name of the Lord Jesus the Christ.  
I say "Amen" and make it sure.  
Now I'll start learning the RIGHT way.  
I KNOW Lord Jesus, YOU are the door.

AMEN!



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Isaiah 61:11

"11 For as the soil makes the  
sprout come up and a  
garden causes seeds to grow,  
so the Sovereign LORD will make  
righteousness and praise spring up  
before all nations." (NIV)

