

# Aestivation

## Aestivation

Like hibernation, aestivation is a state of torpor, commonly compared to a deep sleep or dormancy. However, animals aestivate to escape extremely high temperatures and/or extremely dry conditions, times when food and water may be scarce.

During aestivation, the animal's breathing and heart rates slow. Unlike hibernation, when low ambient temperatures require many hibernating animals to utilize energy from stored foods or body fats in order to maintain a minimum body temperature, aestivating animals don't require much food. Generally, during aestivation, animals won't move, eat, or grow.

### Who Aestivates?

Both land-dwelling and aquatic animals—from fish to insects to amphibians and reptiles to mammals—may aestivate. Some examples of animals that aestivate include lungfish, bees, earthworms, [frogs](#), salamanders, [newts](#), snails, mud turtles, snakes, lizards, and hedgehogs. The only primate known to aestivate is the also the only tropical mammal known to aestivate: the Madagascan fat-tailed dwarf lemur. This lemur aestivates, often in the hollow of a tree, during the several months of the dry season each year, when its food sources are extremely scarce.

Most animals who aestivate bury themselves under the ground, a great insulator from the heat, waiting for the wet season or cooler temperatures. Some dig their own burrows; other utilize burrows left empty by previous tenants. Underground burrows often have a higher level of relative humidity, reducing water losses due to evaporation.

Aestivation may last from hours to months, depending upon the species. For example, snails may aestivate only during the hot hours of the day. They will try to escape from the heat by moving high into vegetation and will protect themselves from water loss by secreting a membrane that acts as a cork in the opening of their shells. Lungfish, on the other hand, can aestivate for many years at a time. They will bury themselves in the mud of dried-up lake beds and wait for enough rain or runoff to once again form a lake.

Because reptiles are cold-blooded, their body temperatures are dependent upon the ambient temperature. The extremely high temperatures of summer, along with a lack of water, may force many reptiles for aestivate during the hottest, driest months of the summer in order to survive.

## **Desert Tortoise**

As their name would imply, desert tortoises have evolved to tolerate the dry heat of deserts. However, they will aestivate during the hottest, driest months of the summer, usually in burrows but sometimes in the cool shade under rock piles. In the extreme dry heat of the Mohave Desert, desert tortoises are most active from February to May. They will spend the remainder of the long, dry summer aestivating. In the (relatively) cooler Sonoran Desert, the monsoon rains allow desert tortoises to be most active from July to October.

## **Couch's Spadefoot Toad**

Many of us have heard it following the monsoon rains: a strange, incessant sound that lies somewhere between the bleating of a lamb and the quacking of a duck. The vibrations of the rain on the ground are the spadefoot toad's cue that the complete inactivity of aestivation is over and a fleeting breeding season can begin. Immediately after they exit their burrows, the males sit at the edge of pools of water, calling loudly to females.

Although spadefoot toads may exit their dens during a brief monsoon storm to eat, breeding will only occur if there have been sufficient rains. The spadefoot can eat enough in one evening to satisfy its energy requirements for an entire year! One favorite food is flying termites, also attracted by the monsoon rains.

A female Couch's spadefoot will lay up to 3,000 eggs, each of which has the quickest development of any frog or toad in America: the eggs can hatch within 15 (up to 36) hours and tadpoles can metamorphose into froglets within 9 (14 on average) days. This speed is absolutely essential for the eggs to become froglets, as water holes can dry up very quickly in the desert.

For those eggs that made it to the froglet stage, another challenge awaits. Although adults can burrow right back into the ground in order to avoid the potentially fatal drying heat of the summer following breeding and a good meal, the froglets must spend several days on the surface in the moistest places they can find, looking for food. After eating their fill, they will use the sickle-shaped, spade-like knobs on their hind feet to burrow into the ground—aestivating until the monsoon arrives the following year.

As animals have evolved, they have adapted to desert climates in many different ways. For some animals, aestivation is the only way they can survive the hot, dry summers of the desert southwest. In fact, some animals that would be active during the summer if they lived in more temperate areas will aestivate if they live here.