

Leopard gecko

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The **leopard gecko** (*Eublepharis macularius*) is a crepuscular ground-dwelling lizard naturally found in the deserts of Asia and throughout Pakistan, to parts of northern India. Unlike most geckos, leopard geckos possess movable eyelids. It has become a well-established and popular pet in captivity.

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Taxonomy

Leopard geckos were first described as a species by zoologist Edward Blyth in 1854 as *Eublepharis macularius*.^[1] The generic name *Eublepharis* is a combination of the Greek words *Eu* (good), and *blephar* (eyelid), as having eyelids is the primary characteristic that distinguishes members of this subfamily from other geckos, along with a lack of lamellae, bumpy skin, and nocturnal behavior.^[2] The specific name, *macularius*, derives from the Latin word *macula* meaning "spot" or "blemish", referring to the animal's natural spotted markings. Leopard geckos are related to many different geckos including the African fat-tailed gecko. There are four species however that are exceptionally closely related to the leopard gecko, one of which was previously included as a subspecies of leopard gecko: In addition, there are five subspecies of leopard gecko;

Distribution

The native habitat of the leopard gecko is the rocky, dry grassland and desert regions of south-Asian Afghanistan, Pakistan, north-west India, and some parts of Iran. Winter temperatures in these areas can be

Leopard gecko



A female leopard gecko.

Conservation status

Not Evaluated

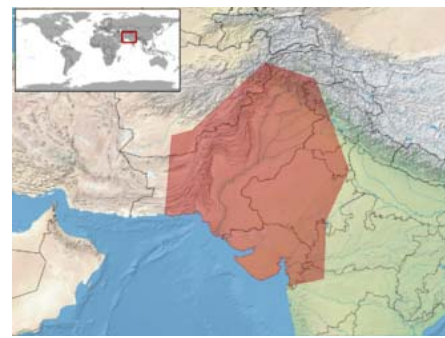
Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Reptilia
Order:	Squamata
Suborder:	Lacertilia
Family:	Eublepharidae
Genus:	Eublepharis
Species:	<i>E. macularius</i>

Binomial name

Eublepharis macularius

Blyth, 1854



quite low, below 10 °C (50 °F), forcing the animals underground into semi-hibernation, called *brumation*, living on fat reserves. Leopard geckos are crepuscular reptiles; they are limited to the burrows during the day but become active at dawn and dusk when the temperature is favorable.^[3] These geckos are solitary, and do not usually live with other animals.^[4]

Diet

Leopard geckos feed on crickets, roaches, wax worms, mealworms, super worms, other insects, earth worms, pinky mice (although these have fatty livers). In captivity, most individuals will prefer hunting food themselves. The majority of captive leopard geckos will also refuse to eat dead prey. Crickets are the most common food source to give them in captivity, as they can hunt them in their enclosure the way they would in their natural environment, though mealworms and certain species of roach are also common. When food is scarce in the desert, they can rely on their ability to store excess fat in their tails. Sufficient calcium and vitamin D3 is also very important for their diet: How they obtain it in the wild is still unknown, although they likely receive this from their varied prey of moths, spiders, ants, and other insects. In captivity, it is near impossible to completely duplicate the diet they will have in the wild, so the most nutritious insects known are offered, usually dusted with a fine calcium powder with added vitamin D3 and sometimes gut loaded by feeding. Their keen sense of smell and sight allows them to search for food in the wild, so they will stalk their prey somewhat like an actual leopard will, moving their tail, and then striking when they are satisfied.^[4]

Characteristics

Leopard geckos are large for a gecko. Hatchlings tend to be 6.5 to 8.4 cm (2.6 to 3.3 inches) in length and weighing about 3 grams while the adult geckos are about 20.5 to 27.5 cm (8.1 to 11 inches) in length and weight about 45 to 65 grams.

Those found in the wild typically have a darker, dull, and drab coloration than those kept in captivity as pets. Those in captivity generally have an assortment of skin colors and patterns. The skin of a leopard gecko is very durable, which provides protection from the rough sand and rocky hills terrain of their dry environment. Their dorsal side is covered with small bumps, which gives a rough texture and appearance while their ventral side is thin, transparent, and smooth. Like all reptiles, leopard geckos shed their skin. In the few days before the shedding, the skin will turn color to a translucent whitish gray.^[5] Adults shed an average of once a month, while juveniles will sometimes shed twice as much.^[6] The gecko will eat its old skin after shedding, revealing a brighter colored one. There are two theories of why leopard geckos do this. One is that in the wild leopard geckos eat their shed skin so there is no trace that the leopard gecko was there.^[5] The other theory is that eating the shed skin is a means for obtaining protein and other vitamins for growth.^[6]



Close up of a juvenile leopard gecko.

Leopard geckos are ectothermic. They absorb warmth and energy during the day as they are sleeping, so they can hunt and digest food at night. In addition, they have short legs, which enable them to be quick and agile while their small nails allow them to climb twigs and rocks. Leopard geckos have openings on either side of their head as ears. A tympanic membrane covers and protects it. They use their ears to locate their prey. Healthy leopard geckos have thick, fleshy tails; a thin tail is an indication that the gecko is not healthy and may be lacking nutrition. Although, when in captivity, the tail can be fattened by the feeding of waxworms (wax moth larvae), these worms are typically too fatty for the gecko to get the nutritional value it needs. They can also be fed "pinkys", a one-day-old mouse to fatten up the tail, but again, these are very low in nutritional value.^[7] Breeders recommend coating crickets in a nutritional powder before serving them either live or dead. Leopard geckos' thick tails can regenerate when lost; however, the regenerated tails appear stumpy and never have the same appearance as the original tail.^[4]



A leopard gecko that lost and grew back its tail.

Unlike many other geckos, but like other *Eublepharis*, their toes do not have adhesive lamellae, so they cannot climb smooth vertical walls.

Teeth

Leopard geckos are polyphyodonts and able to replace each of their 100 teeth every 3 to 4 months.^[8] Next to the full grown tooth there is a small replacement tooth developing from

the odontogenic stem cell in the dental lamina.^[9]



A leopard gecko shedding its skin. The gecko eats its skin after shedding. Click the file link in the upper right of this description for the full resolution video.

Defense mechanisms

Leopard geckos have predators such as snakes, foxes and other large reptiles. Their keen sense of hearing and sight help them escape from them during the night. Along with their exceptional sight and hearing abilities, their skin helps camouflage themselves from their predators. Their sense of taste and smell also helps them with survival. The shedding of their skin also removes any scent markers left behind for potential predators to discover. They also stay in underground holes and burrows during the daytime, not only to avoid the heat, but to also avoid the risk of getting eaten.^[4]

Leopard geckos also have the ability to voluntarily detach their tails if it is attacked, grabbed by the tail, bitten during copulation, or nipped by another during feeding. This is called caudal autotomy. After autotomy the tail can continue to twitch for as long as 30 minutes, allowing the gecko to escape from its predator.^{[10][11]} The tail is large and at least in one related species (*Christinus marmoratus*) it has been reported that the tail-less fleeing gecko makes for a quicker getaway.^[12] Fractures in the tailbone allow the tail to separate easily and rapid vasoconstriction allows the gecko to suffer minimal blood loss. This detaching of the tail causes a high level of stress on the gecko due to the loss of the valuable storage of fat it once had.^[13] It will start to regenerate its tail immediately because it is needed for survival. A lost tail may increase the chance of sickness in the gecko and in some cases kill it, but this is very rare.^[4] Regenerated tails often retain similar colors to the original tail [though there will most likely be a wide variance from the vibrancy and patterns of the original], however they are often smooth and lack the rigid qualities and length of a normal tail. The tail will also be shorter and often fatter than the previous tail.

Sexual dimorphism

Sexual dimorphism is defined as a phenotypic difference between males and females of a species. It can be commonly found in animals, such as the leopard gecko and other reptiles.^[14] It exists in adult males and females, but can be difficult to determine in young geckos. The underside of a gecko truly determines the sex of the gecko. Males have pre-anal pores and hemipenal bulges while females have smaller pores and do not have external bulges.^[4]

Males can determine the sex of other leopard geckos by smelling pheromones on their skin. Males respond to males with aggressive behavior while they demonstrate courtship behavior towards females.

Towards other males, the male would raise itself up from the ground, extend his limbs, and arch his back with the swelling of the tongue in aggression. He will then make short dashes and quick, vigorous bites, which



An adult male leopard gecko

frequently lacerate the skin and sometimes severely injure his opponent. Males behave the same way towards females while they are shedding their skin. Before and after the shedding of the skin, the males still express courtship behavior towards the females.^[15]

Reproduction

Leopard geckos are also known to have temperature-dependent sex determination (TSD). Research shows that more females can be produced in predominantly cool temperatures (about 26–30 °C (79–86 °F)) and very warm temperatures (about 34–35 °C (93–95 °F)). It was recorded that males can be produced at the intermediate temperatures (about 31–33 °C (88–91 °F)). Females born in the higher temperatures differed from those who were born in the lower temperatures hormonally and behaviorally. Those born in the warmer temperatures expressed more aggressive behavior.^[16] These are known as "hot females" and are often determined to be infertile.

Leopard geckos will breed typically in the summer. Females can store sperm over the course of their breeding season, so they can produce up to three clutches from one or two copulations, therefore, the male is not needed for reproductive success after the first or second copulation.^[17] Once the female has mated and received sperm, she will need an abundance of calcium for health and to ensure that the eggs calcify properly. She can lay about six to eight clutches, which consists of two eggs in each clutch. They will normally lay two eggs approximately 21 to 28 days after mating. After 45 to 60 days, droplets of moisture will appear on the shell and the shell will begin to shrink and partially collapse. These are indications that the eggs will hatch. Baby leopard geckos will have an "egg tooth", a calcareous tip at the end of its snout to help break their egg shell. Their "egg tooth" will fall off within one to two days. In addition to this, their skin will usually shed within 24 hours of hatching. The leopard gecko hatchling will not be able to eat until after the first shedding.^[4]

Conditions and diseases

Captive born and bred leopard geckos do not carry any diseases that are transmissible to humans. Salmonella is not an issue, because they live in a dry environment and the disease usually occurs in aquatic or semi-aquatic species kept in unsanitary housing conditions.^[18] However, there are several common diseases that leopard geckos may experience.

- Gastroenteritis, caused by bacterial or protozoan (especially Coccidia) infection brought on by such things as unsanitary conditions, can lead to symptoms such as diarrhea. As a result, geckos may present with watery and/or bloody stool. Normally the stool is dry and well-formed with a small white portion. It is contagious and can be spread easily. Other symptoms of the disease include weight loss, a skinny tail, undigested cricket masses. If it is not treated, the gecko will stop eating, become dehydrated and scrawny, and possibly die.^[4]
- Metabolic bone disease or MBD is a nutritional deficiency caused by a lack of calcium and vitamin D₃ in the diet. Calcium and vitamin D₃ are critical for proper bone formation during development and for proper calcification of eggs for a pregnant female. Geckos with MBD will experience symptoms such as weakness, bones becoming spongy, deformities in their limbs and spine, twitching or tremors, and a lack of appetite. Recovering from this disease can be very difficult.^[4]
- Anorexia in leopard geckos can be caused by stress, unsanitary conditions, nutritional diseases, or other diseases. Anorexic leopard geckos appear thin, develop an extremely thin tail, become weak and sluggish, stop eating, and usually die if untreated.^[4]

- Dysecdysis is a condition in which a leopard gecko has problems shedding its skin due to poor nutrition, lack of humidity and moisture, and poor care. Incompletely shed skin will appear as dry patches on various areas of the body such as the head, eyes, limbs, and tail. Leopard geckos with this condition may develop eye problems, have difficulty in walking, and noticeable constricting bands of old skin around their limbs. If the condition is not treated, it could lead to infection.^[4]
- Pneumonia is a severe respiratory tract infection that can be caused by bacteria in the lungs. Leopard geckos may be susceptible to this if their environment is too cool and humid thus compromising their immune system. Mucus bubbles appear in the nostril area of geckos with pneumonia, and they have difficulty breathing. The problem is usually resolved when the environment temperature rises to about 82 to 85 °F (28 to 29 °C).^[4]
- Sand impactions and prolapse can occasionally occur. This condition may result if a leopard gecko ingests sand or other substrates they live on.^[4]

Leopard geckos as a pet

Leopard geckos are one of the most popular reptile pets. They are possibly the first domesticated lizard species.^{[19][20]} Their small size, robustness, and relatively easy care makes them a good "beginner" reptile pet.^[21] They breed easily in captivity, so most sold today are captive-bred rather than wild-caught.

Selecting a leopard gecko

Choosing the "right" leopard gecko mainly depends on personal preferences. Most leopard geckos are captive-bred and can be bought from pet stores or breeders themselves. When selecting one, it is best to consider the:

- **Size** - New born hatchlings are usually 6.5 to 8.4 cm long and can grow to an average size of 11 inches. For beginners, it is recommended that immature leopard geckos between the sizes 4 to 6 inches are the best. If you want a bigger and more robust lizard, a retired breeder is recommended.
- **Gender** - The gender of the lizard is very important. Although both male and female lizards are equally nice to have, adult male lizards need be separated because they will fight and injure each other. If you are looking to breed leopard geckos or keep multiple ones in a single habitat, than females are able to live together and there should only be one male per every 10 to 20 females.
- **Morphs/Variations** - There are many varieties of leopard geckos that also range in various prices. There are normal (cheapest), jungle, striped, reverse stripe, patternless, etc. These patterns can also come in different colors normal, high yellow, orange/tangerine, white, lavender, ghost(faded colors), melanistic (predominately black with any white pattern), and amelanistic (albino, genetically lacks melanin). Deciding which lizard to get depends on which pattern and color you like most however you must look breeder for the more exotic ones.
- **Health** - The health of the lizard is probably the most important factor when deciding which lizard to get. 1. The body outline should be smooth, there should be no hipbones visible, and have a rounded tail. A wrinkled tail does not mean it is unhealthy but it can mean that it has not been fed for an extended period of time. 2. The mouth, when closed, should appear even, with no jutting upper or lower jaw. 3. They should have an even number of fingers/toes and not have any missing or swollen. 4.

Eyes should be even in size. Avoid geckos with small eyes or large big-eyes. 5. Check its fecal matter for consistency. Their feces should be semiformed, somewhat pelleted in shape, and also be dark with whiteish urates. pale, light-colored, yellow-orangeish, pasty, and runny feces all means that the lizard may have some kind of disease.^[19]

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External links

- Leopard Gecko Wiki – Great resource for Leopard Gecko information (http://www.leopardgeckowiki.com)
- Leopard Gecko Care and Information (http://www.leopardgeckos.co.za)
- Leopard Gecko Caresheet (http://www.londongeckos.co.uk/?page_id=8)
- Leopard Gecko Pedigree Database (http://www.leolineage.com/)
- "Breeding of the Leopard Gecko" (http://www.marthastewart.com/924659/breeding-leopard-gecko) (VIDEO). *marthastewart.com*.



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