

# Cohabitation of Leopard Geckos

This is a brief introduction to the cohabitation of leopard geckos and should serve as a starting point of research, rather than a sole source. Cohabitation requires a lot of work, both in structure of the enclosure as well as monitoring the animals' behaviour, and because of this it should be reserved for only the most experienced of keepers. Keepers new to the species should not attempt cohabitation as they lack experience with the small nuances of leopard gecko behaviour and may mistake undesirable behaviour for normal behaviour. Cohabitation when done incorrectly can lead to serious injury and death of one if not all animals involved. That all being said, when done correctly and the keeper is vigilant it is possible to successfully cohabitate leopard geckos; however, it's important to note that **even doing so properly does not guarantee the safety of the leopard geckos.**

## **Do They Benefit From Having Friends?**

This is a highly debated topic. Some say that cohabitation is a great form of enrichment and social stimulation while others claim that they cannot form bonds and therefore the benefits of cohabitation are for the keeper rather than the animal. In truth, the research around the communal living of leopard geckos is ongoing both in captivity as well as in their natural habitat, and it is important for a keeper to research both sides before coming to their decision on whether or not this is a method of keeping they wish to participate in.

Due to a lack of studies on the specific topic of cohabitation, it's important to research various other topics that include the cohabitation of leopard geckos in order to obtain as much information as possible on their behaviour towards one another until a specific paper is released about this subject.

'Social Experience Affects Territorial and Reproductive Behaviours in Male Leopard Geckos *Eublepharis Macularius*' is a study on the behaviour of male leopard geckos and their behaviour during courtship of female leopard geckos based on whether they were naive (housed in isolation prior to introduction to a female) or experienced (housed with females prior to being observed for the experiment) and tells us a fair bit about the different interactions between leopard geckos dependent on how they are housed, as well as a bit of their overall behaviour even when away from other geckos. **Please note is it not recommended to house male and female leopard geckos together outside of breeding purposes, specifically the mating process only.** While the experiment focused on courtship and territorial behaviours it did note that the male leopard geckos who had been housed with multiple females appeared more active when separated and placed in a 'neutral zone'. These males also displayed more confident courtship behaviours with female leopard

geckos, and displayed more territory marking when placed within the neutral zone. The naive males who had been housed solely in isolation however appeared to display less territorial and courtship behaviours but most importantly (for this topic, not the experiment itself) they appeared to be more 'flighty' when placed within the neutral zone. While there have been studies linking anxiety to mammals who are housed in isolation the same has not been done (yet) for most reptiles. It is important to note that this behaviour, though not the purpose of the experiment and therefore not recorded extensively, was observed with leopard geckos as well to some degree. This could possibly point to the cohabitation of leopard geckos somehow lessening possible anxiety.

There is another commonly cited paper, 'Leopard Gecko *Eublepharis Macularius* From Pakistan', which speaks specifically (although briefly) on observed colonies of wild leopard geckos. It states how they are seen in burrows together in large groups, only to later scatter once night hits, or how large colonies have been seen in urban areas, hiding in man made objects and areas such as pipes and stone walls. It touches on how large groups of subadults exist, with geckos of various ages living together until they begin to reach sexual maturity. Once this happens the males begin to fight for territory, with one becoming the winner. This winning male leopard gecko becomes the dominant gecko of the group, pushing all other males out so it is only him and females, fighting off any males that try to invade his territory in any way. This paper is commonly used when speaking on behalf of cohabitation as it clearly shows observed colonies, however when you look into it further it is very vague. Leopard geckos are crepuscular with a nocturnal bias in the wild, especially during the hotter summer months, meaning they are awake during twilight hours and throughout the night. While they have been observed sleeping in groups in burrows during the day, it clearly states that they separate and scatter during the night implying little to no interaction during waking hours. It also states that they are found in man made objects and areas, speculatively this could be due to urbanization and the clearing of their natural habitat, causing them to adapt to this way of living. So while this paper does strongly suggest that they can, and will, live in groups, it does little in the ways of explaining why this may be or elaborating further on whether or not it is beneficial to replicate this in captivity.

While these studies exist it's important to note that not only do they lack a focus on the specific aspect of cohabitation of leopard geckos, they also lack a focus of long term cohabitation of leopard geckos in captivity. How an animal behaves in their natural habitat is not always how they behave in captivity. The leopard gecko, for example, is crepuscular in nature but shows cathemeral behaviour in captivity, showing that the conditions that captive reptiles are kept in versus those they would have in the wild can cause variations in some aspects of their behavior.

It is widely known through generations of keeping these creatures that they tend to show more aggressive behaviours towards one another when housed together in captivity. Keepers who have successfully cohabitated multiples of this species have noted that,

occasionally, after some time one if not both of the geckos would turn on each other. Geckos that have lived together in peaceful harmony for over a decade or even decades have one day suddenly begun to show signs of aggression and mistrust. Whether this is due to poor keeping, outdated practices, the personalities of the individuals, or something else entirely, we can't say for sure. It could be that for whatever reason these animals do better in isolation when kept in captivity, or it could be that our ways of keeping them are not quite right and therefore creates stressors unknown to us that cause distrust between the animals.

Until further research is done on this specific topic, no one can say with absolute certainty whether or not keeping these animals in multiples truly benefits or hinders them overall in captivity. While there may be some benefits and some negatives, overall there is no clear conclusion. This is why it is imperative that a keeper who chooses to cohabitate is very familiar with leopard gecko behaviours and mannerisms so that they may quickly pick up on any signs of possible aggression or distrust that could lead to further negative consequences.

## **How Many Geckos Can I Cohab Together?**

There are generally two categories of cohabitation in regards to numbers of leopard geckos housed together. You can have groups of 2-3 individuals, or you can have groups of 4 or more. It is recommended to keep smaller groups of 2-3 when cohabitating as it allows the keeper to more easily monitor the geckos health, properly house the geckos due to spatial limitations, as well as observe behaviour and interactions between the geckos. When you house 4 or more geckos together it then gets more difficult to properly keep track of whose feces is whose, as well as vigilantly monitor interactions between each, leaving open a possibility of early signs of aggression and mistrust to go unnoticed, or for a situation to escalate very quickly if one were to arise.

**It is recommended that only females be housed together.**

Two males will fight over territory as that is their nature, and while a male and a female can potentially live in harmony it will result in regular breeding. This not only adds to the saturation of the pet industry by creating more unintentional offspring, but is also very hard on the female's body. leading to a shortened lifespan and premature death due to possible laying complications. Females can lay unfertilized eggs on occasion; however, in many cases they will simply reabsorb the egg before it is fully formed. By housing a female with a male it leads to fertilized eggs being formed, and these cannot be reabsorbed by the female and instead must be laid. When laying they lose a lot of their calcium and other nutrient stores because their body prioritizes the eggs. Not only does the female become nutrient deficient but there is also the added risk of egg binding, where the egg cannot be properly passed and instead gets 'stuck', this is a potentially fatal occurrence and requires

immediate emergency veterinary care. This can also lead to ruptured egg follicles and a number of other egg-related issues that are typically life threatening. Even breeders, provided they are reputable, will not house a male and female leopard gecko together outside of designated pairing sessions, and females are typically never paired more than every other breeding season to allow the gecko to recuperate for well over a year.

## How to Safely Introduce Your Geckos to Each Other

Before you start keeping your geckos together it is important to first introduce them to one another in a safe way to prevent as much defensive behaviour as possible once they're housed together. This takes time and requires patience by the keeper but is a very important process that can prevent possible and avoidable altercations between the geckos. It is important to note that all geckos being introduced, especially with the intention of cohabitation, should be **of the same age and same size** to avoid the larger/older gecko immediately assuming a dominant position within the group, which can lead to acts of aggression down the line. It is also important that all geckos go through a quarantine stage and a full veterinary exam prior to introduction to ensure good health.

- Step 1) Getting Them Used To Each Others' Scent:** Leopard geckos like many animals rely heavily on their sense of smell to determine what is food, what is their territory, and what is another's territory. In order to begin getting your geckos used to each other you must get them used to the others' scents so that they are less likely to see the other gecko(s) as a threat. This can be done by occasionally swapping decor between enclosures so that the geckos slowly get used to the unfamiliar scent and do not associate it with anything negative but simply see it as something that coexists.
- Step 2) Brief Introduction Periods:** After an extended period of time where the geckos are getting used to new scents and no longer show any prolonged interest in items from the other enclosure(s) then you can begin to introduce the geckos in a **neutral zone**, such as a play pen, for short periods of time (5-10 minutes) while being closely monitored. This neutral zone should be thoroughly cleaned between uses to avoid any leftover scents so that it feels like a new area for all geckos upon each use. Any decor items used in this area should also be fully cleaned to remove scents and should be rearranged to keep the area "new" and neutral. This creates an 'even playing field' where all geckos involved are experiencing a new space that has not been claimed by any one gecko. Keep in mind that dominant behaviour is common amongst this species and is perfectly normal, however remove all geckos if aggressive behaviour is displayed.
- Step 3) Extended Introduction Periods:** Similar to Step 2, this step focuses on placing the geckos in a neutral area and allowing them to interact with one another but now



for an extended period of time (10-20 minutes) to ensure good relationships between all geckos. You should only move on to this step once the geckos no longer show defensive behaviour towards one another in step 2, and are instead calmly coexisting in the neutral zone. This step is to further healthy relationships between the geckos before putting them in their permanent home together, allowing them to get used to spending more time together rather than just the brief intervals used in the previous step.

**Step 4) Adding Geckos To The Communal Enclosure:** This is when the geckos are finally added to their permanent home. While there are few steps involved it is important that you take your time and don't rush any of the steps. Ideally this **whole process should take multiple months** before finally coming to the last step. Once the geckos have been thoroughly introduced, are calm around each other, and seem to have healthy relationships, you can add them to their more permanent home. Be sure to **use a thoroughly cleaned or brand new enclosure** as any **preexisting enclosures will smell like the original gecko housed in it, and will cause fights over territory** (as the original gecko would have claimed this as their own territory already).

## Enclosure Size and Setup

The recommended enclosure size for a single adult leopard gecko is 36"x18"x18" / 90cm x 45cm x 45cm following Germany's keeping standards, as it is a country well known for its focus on up to date reptile keeping and welfare; in Austria the legal minimum is even larger and is another country with great standards. To house multiple geckos together you must have an even larger enclosure to accommodate the extra animal and it is important to ensure you have proper space to do so, as well as find a manufacturer that can accommodate larger, custom enclosures. While it is true that there is no such thing as too big for a single leopard gecko (simply too bare) the same is not always said about cohabitating leopard geckos. Some keepers believe if the enclosure is too big then each gecko will create its own territory, causing them to avoid each other and often leading to fights when they do end up face to face. With this mentality, it is better to instead keep them in an enclosure that allows for the geckos to get some distance between each other if needed, but still allows for regular interaction so as to maintain healthy relationships and to avoid the creation of separate territories. Unfortunately due to the little information around cohabitation we cannot say for sure whether or not these ideals are true, as there are many keepers who also believe that bigger is still better even with multiple geckos and have successfully housed them in larger than recommended enclosures. It is also important that the enclosure is set up in a way that allows for the geckos to each have their own hiding spot if they so choose. While most do end up sharing hides, it's important to give them the opportunity to get away from the other(s).

**Minimum Enclosure Size:** 40"x20"x16" / 100cm x 50cm x 40cm (LxWxH) is the Austrian legal **minimum requirement for one to two adult leopard geckos**. Austria's legal minimum space added per additional gecko is 310sqin/0.2m<sup>2</sup> of foot space. Using this we can then say that the recommended minimum size enclosure for **2-3 leopard geckos** would roughly be **47"x24"x16" / 120cm x 60cm x 40 cm** and for **3-4 it would be 60"x24"x16" / 150cm x 60cm x 40cm** and so forth. Note here that it is recommended to only keep groups of 2-3 as mentioned above.

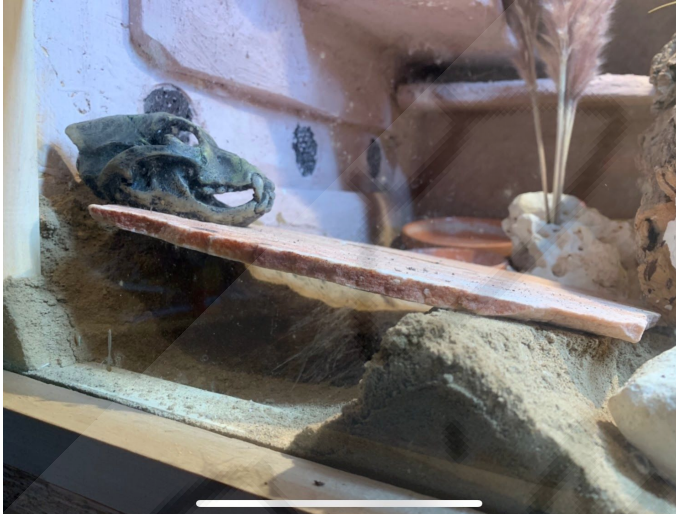
**Minimum Hide Requirement:** 1 warm hide **per gecko**, 1 cool hide **per gecko**, 1 moist hide **per gecko**. It's important to provide at least one of each of the three main hides per gecko as it allows for them to separate while still using the desired type of hide if need be. This way if a gecko would like to avoid the others, but would also like to use a warm hide then they are able to do so. Of course this is just a minimum requirement and it's always best to add even more.

**Minimum Dish Requirement:** Similar to the hides above it is recommended to have one water bowl **per gecko** and one calcium dish **per gecko**.

It is also **important to make use of all available space of the enclosure**, including height. Ledged backgrounds for climbing, branches, logs, cork, and various other climbing devices are an absolute must when cohabitating geckos. Not only do they provide enrichment and exercise but they also provide another way for the geckos to avoid each other if need be. Just like humans sharing a living space, sometimes they just need a break from one another. Below are some images of Eva Meißner's enclosure which measures roughly 59"x24"x24" / 150cm x 60cm x 60cm and houses three geckos. Due to the length it has two warm zones (please see Heat & Heat Sources file for more information on heating) and is a great example of just how **full** an enclosure should be for cohabitation.









## Important Leopard Gecko Behaviour to Note

**Tail Wave:** A defensive pose where the gecko will raise its tail high and slowly wave it back and forth. Seen as a 'back off' signal that can be used prior to an act of aggression (warning) or fleeing (bluffing). Tail waving is important to note as it occurs when there is some form of altercation between the two geckos, whether it be mild annoyance or the start of a much more severe and ongoing problem between the two.

**Tail Vibration:** Tail flicks back and forth very quickly, can be used while in a defensive position but is commonly used when hunting (to distract prey) or when excited. If being used during a defensive position the tail will be raised high with the head low, if being used as a sign of excitement or during hunting then the tail will be held low.

**High Posture:** Standing tall with stiff limbs, sometimes an arched back. Defensive pose to intimidate predators and opponents. 'Standoffish' pose.

**Chirping:** Used to communicate with one another, not to be mistaken with vocalization.

**Vocalization:** 'Screaming' commonly used as a defense tactic by young geckos to confuse whatever they view as a threat. Very effective and loud, used less as the gecko ages but can still occur with adults who are physically unable to escape or fight back either due to ailment or poor physical condition.

**Freezing:** Laying low to the ground, unmoving, to try and remain unnoticed. Defensive pose.

**Backing Up:** Defensive tactic used before escape, can be a sign of submission as well.

**Escape:** Quickly retreat during an altercation, may also try to climb to a higher area in order to get away from threat. Escape is more common in adults (just as vocalization is more common in juveniles,) and must be taken seriously. If one of the geckos is constantly trying to escape the other it could mean that an altercation occurred where the escaping gecko no longer feels safe around the other and instead sees them as a threat.

**Tail Drop:** A gecko may drop its tail if it feels threatened but can't escape, is severely stressed, or some sort of injury occurs to the tail. Even if the drop isn't caused directly by cohabitation it is imperative that the gecko who dropped their tail is separated while healing.

**Glass Surfing:** Can be a sign of stress or that the gecko wants out of the enclosure. Very important to note as the stressor may be the other gecko.

**Biting:** Act of aggression and is a territorial behaviour.

**Nipping:** Biting without the intent to do harm. Usually used as a way to display dominance or annoyance.



**Chasing:** Can be a display of dominance in mild cases, usually a form of aggression due to territorial behaviour and should always be treated as an act of aggression out of precaution.

**Laying On Top of Another:** Can be a sign of dominance if done continuously and with the same gecko on top/making a point to be on top.

## **Dominance vs Aggression and When to Intervene**

The words “dominance” and “aggression: are commonly used interchangeably but they mean very different things and it is important to understand these two words and the behaviour associated with each.

**Dominance** is when one creature obtains temporary priority access to resources without the use of aggression. This is usually obtained through many means such as motivation, persuasion, bribing, bluffing, or argumentation, and is a normal relationship to occur within leopard gecko groups as the species has been regularly observed with hierarchical systems when living in colonies. A relatable example would be parents in a family unit holding dominance over their offspring due to their experience in problem solving, as well as their age. It is also common in these sorts of social situations for the lower standing gecko to even appoint another gecko as dominant, similar to picking a ‘leader’. A good thing to keep in mind at all times is that dominance is not a personality characteristic but is instead a description of the relationship between two or more geckos and in a healthy hierarchy dominance isn’t always assigned to just one gecko but instead shifts back and forth between all geckos depending on the situation.

**Aggression** on the other hand is when one or more of the geckos begin to push too much and begins to harm the other geckos involved. A hierarchy based on aggression is very unstable and will result in fighting as the lower ranking geckos (unable to leave due to being kept in captivity) will either eventually begin to fight back against the aggressor or will be killed by the aggressor. This is why it is so important to observe how the geckos interact with each other. What body language is used by the dominant gecko during the observed interaction? What is the body language of the lower ranking gecko in response? Did the dominant gecko cause harm to the other? Did the other appear frightened? While maintaining dominance is important in hierarchical systems, it must be done in a respectful way in order to maintain trust and understanding between all geckos. If one gecko is constantly preventing others not only from eating before them, but eating in general (one gecko appears healthy or possibly overweight while the others appear underweight) then that gecko has crossed the line from dominance to aggression. If two geckos get into an altercation and one nips at the other to tell them to ‘back off’ then that is an act of dominance, however if the gecko instead bites forcefully with clear intent to harm then it is an act of aggression. Acts of aggression eventually lead to lower ranking geckos fighting

back and it is in these cases that you hear of the death of one if not all geckos involved and is why you must be vigilant in observation and act as soon as you see warning signs as opposed to after it escalates.

**If any signs of aggression appear then the aggressor must be separated immediately.** Once this occurs you must continue to watch any geckos that are still housed together to ensure that one of the remaining geckos (assuming more than 2 were housed together to begin with,) doesn't become a new aggressor due to pent up frustration. Just a reminder: **signs of aggression aren't always biting**. It could be lower ranking geckos being unable to maintain a healthy weight due to resources not being shared, it could be how lower ranking geckos appear more anxious in general or it could even be when they appear fearful when around the aggressor.

### **Final Note**

We do not advocate or recommend the cohabitation of leopard geckos in any way, shape, or form. It is **always** safest for the leopard gecko to house them alone.

## Sources

'Social Experience Affects Territorial and Reproductive Behaviours in Male Leopard Geckos Eublepharis Macularius' by Jon T Sakata, Ajay Gupta, Chien-Pei Chuang, David Crews  
<https://doi.org/10.1006/anbe.2001.1952>

'Leopard Gecko Eublepharis Macularius From Pakistan' by Muhammad Sharif Khan  
[https://www.researchgate.net/publication/304381063\\_leopard\\_gecko\\_Eublepharis\\_macularius\\_from\\_Pakistan?fbclid=IwAR1-SxhsNTzfQDGxdyNBtOifHh5fMcL01Bdtoc9TobpreFXhkTOR5uZsxxrk](https://www.researchgate.net/publication/304381063_leopard_gecko_Eublepharis_macularius_from_Pakistan?fbclid=IwAR1-SxhsNTzfQDGxdyNBtOifHh5fMcL01Bdtoc9TobpreFXhkTOR5uZsxxrk)

'Mindestanforderungen an die Haltung von Reptilien vom 10. Januar 1997' (German)  
[https://www.bmel.de/SharedDocs/Downloads/DE/\\_Tiere/Tierschutz/Gutachten-Leitlinien/HaltungReptilien.pdf;jsessionid=45ED538A7AF135B9F1A7F3AB5F65E9F8.internet2842?\\_\\_blob=publicationFile&v=2&fbclid=IwAR2ng1w6tLhijlF16yRdfniAnLdbjiXYnYBT4YpmavLXv1tGhY3JpOkjhAc](https://www.bmel.de/SharedDocs/Downloads/DE/_Tiere/Tierschutz/Gutachten-Leitlinien/HaltungReptilien.pdf;jsessionid=45ED538A7AF135B9F1A7F3AB5F65E9F8.internet2842?__blob=publicationFile&v=2&fbclid=IwAR2ng1w6tLhijlF16yRdfniAnLdbjiXYnYBT4YpmavLXv1tGhY3JpOkjhAc)

'Austrian Animal Husbandry Ordinance' (German)  
[https://www.vetmeduni.ac.at/fileadmin/\\_migrated/content\\_uploads/Anlage\\_3\\_Reptilien\\_2012.pdf?fbclid=IwAR3vRpgVIKHysX3sMwl7xyFvTq7NOp4wygdl4XMWjYgcjmqtv3mkPGQgmv8](https://www.vetmeduni.ac.at/fileadmin/_migrated/content_uploads/Anlage_3_Reptilien_2012.pdf?fbclid=IwAR3vRpgVIKHysX3sMwl7xyFvTq7NOp4wygdl4XMWjYgcjmqtv3mkPGQgmv8)

'Ontogenetic Switch Between Alternative Antipredatory Strategies In The Leopard Gecko (Eublepharis Macularius): Defensive Threat or Escape' by Eva Landová, Jitka Lásková, Stěpanka Kadochová, Veronika Musilová  
[https://www.researchgate.net/publication/257388046\\_Ontogenetic\\_switch\\_between\\_alternative\\_antipredatory\\_strategies\\_in\\_the\\_leopard\\_gecko\\_Eublepharis\\_macularius\\_Defensive\\_threat\\_versus\\_escape](https://www.researchgate.net/publication/257388046_Ontogenetic_switch_between_alternative_antipredatory_strategies_in_the_leopard_gecko_Eublepharis_macularius_Defensive_threat_versus_escape)

'Critical Reasoning---on Aggression and Dominance' by Roger Abrantes  
<https://ethology.eu/critical-reasoning-on-aggression-and-dominance/>