

Your First CHAMELEON

by Bill Strand



A Publication of the
CHAMELEON BREEDER PODCAST

Welcome!

This book was specifically written for those who would like a no-nonsense crash course in chameleon husbandry. The goal of this mini book is to present the basics in a form that can be absorbed within 30 minutes. This will get you started on the right path, but only gets you started. There is a lot to know! The purpose of this book is not to give you all the answers, but to let you know the right questions you should be asking.

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The Chameleon Breeder Podcast

In 2015 the first podcast dedicated to keeping and breeding chameleons was launched. This weekly infusion of chameleon talk continues to gain momentum and popularity. When it launched, it spent a number of weeks on the iTunes New & Noteworthy charts and has become a favorite companion for long commutes and cage cleaning days. With tutorials, discussions, and interviews, this podcast seeks to strengthen the chameleon community through sharing what we know and bringing up discussion of the things we don't yet know! We explore all aspects of chameleons here. Join us as we every Friday as we "Learn, Understand, And Pass it On."

This book is a companion to the podcast and gives a quick shot of the best basic chameleon information to get you started!

The Chameleon Breeder Podcast can be found on iTunes and online at <http://www.chameleonbreeder.com> or via the dedicated iPhone/iPad Chameleon Breeder Podcast App.



The Author

Bill Strand is the host of the Chameleon Breeder Podcast and has been involved with chameleon husbandry in some form or another for almost four decades. He has enjoyed the quiet simplicity of having a single Jackson's Chameleon to the invigorating pace of running a large scale breeding facility. He was an original co-founder of the Chameleons! eZine (www.chameleonnews.com) and led the South Bay Chameleon Keepers group (SBCK) in Southern California. In 2013 he founded the Dragon Strand caging company that specializes in enclosures that meet the needs of chameleons. Both Dragon Strand and the Chameleon Breeder Podcast reflect his continued involvement in not only the keeping and breeding of chameleons, but to build the chameleon community. He may be reached at Bill@chameleonbreeder.com.



Dragon Strand Chameleon Cages

All expenses involved with the creation of this book in multiple formats were covered by the Dragon Strand chameleon caging company. Dragon Strand specializes in chameleon caging from standard screen to display quality clear sides to rack compatible breeder cages with opaque sides. Every cage is rust proof and has a drainage tray available. The product line includes wide format caging and the unique, patent-pending Dragon Ledges which allow the mounting of branches and potted plants on the screen side.

Learn more about Dragon Strand at <http://dragonstrand.com>



Warning!

Chameleon care is so much more complicated than what a booklet like this can cover. I dedicate entire podcast episodes to subjects that are summarized into a couple sentences here! If you run into conflicting information in your research just remember that conflicting information is often just different facets of the core truth. When we distill an immensely complicated subject into one sound bite of advice we have to generalize. This book is a severe generalization! I spend 30 to 60 minutes a week on the podcast talking about the nuances of chameleon care and even that is not all there is to the story!

Let's start with some Frequently Asked Questions!

How hard is a chameleon to keep? One thing to face up front is that chameleons take a bit of set up expense, preparation, and require daily maintenance. But if you get set up properly and get plugged into the community it really isn't that hard to keep a chameleon healthy for a long life. They require more expense and time than the average reptile pet so get a chameleon only if only a chameleon will do!

How long do chameleons live? Smaller chameleons such as Carpet Chameleons and Pygmy Chameleons may live two to three years. Medium size chameleons such as Veiled, Panther and Jackson's Chameleons may live five to seven years. Large Chameleons such as Meller's and Parson's Chameleons may live 15 to 20 years. The more we learn about husbandry the longer they are living in captivity so I look forward to these numbers becoming obsolete!

Can I hold or tame my chameleon? Yes, chameleons may be held. But don't expect your chameleon to like being held. Different chameleons take to holding differently. Most tolerate handling, many hate it, and very rare individuals actually seem to enjoy having their humans take them out. Stack the odds in your favor by getting a captive bred chameleon, but, still, recognize that chameleons, at the most basic level, are not social animals.

Can chameleons live together? The simple answer is no. Some people, for various reasons, want very much to have this be a yes and will tell you yes (especially if it means you will buy a second chameleon from them). Still, no... don't do it. I know you see pictures of them together. I know you see them together in pet stores. And, unfortunately, beginning breeders will say it is fine because they do it. Still...NO.

Will my chameleon get lonely? No. Chameleons have a much different social structure than we do. Getting them a "friend" in the same cage will actually cause stress and complicate the situation.

Should I get a baby or an adult? The age of the chameleon is less important than whether they are captive bred or wild caught. Adults are more likely to be wild-caught meaning they will be more difficult to acclimate and will probably have parasites and life injuries. Captive bred chameleons, whether baby or adult, will be more used to humans and should have reduced or no parasites. A three month old baby chameleon is typically stable enough to go to a new home and should be able to be raised without issue. A well started (typically three months or older) captive bred chameleon is the ideal starting point.

Should I get a male or a female? Male and female chameleons are the same as far as pet potential. A lone female chameleon may produce infertile eggs, but if she is healthy these should be passed without issue.



Male Blue Panther Chameleon, Nosy Be
(*Furcifer pardalis*, Blue phase)



Male Carpet Chameleon
(*Furcifer lateralis*)



Male Natal Midlands Dwarf Chameleon
(*Bradypodion thamnobates*)



This simple cage has a tube UVB light on top, a heat lamp to the right, a store bought water dripper, plenty of plant cover and a variety of branches.
(Male *Kinyongia multituberculata*)



Whether your cage is simple or elaborate, give your chameleons an area to warm up, cool down, and a place to hide. A functional cage can be beautiful as well! (Male *Furcifer pardalis*, *Ambilobe* morph)



House chameleons together only for a limited time such as for breeding purposes.
(*Furcifer pardalis*, *Ambilobe* morph)

Enclosures

The most general purpose chameleon cage for a chameleon the size of an adult Panther, Veiled, or Jackson's Chameleon would be the all screen 24" x 24" x 48" tall cage. But the bigger the cage the better! The enclosure must be big enough so that the chameleon may move freely from a warm corner with a basking light to a cooler area. (This is known as a temperature "gradient"). Chameleons are horizontal animals so you can go lower in height but you then must go wider. Screen cages will work for most cases as most chameleons, once warmed up, are comfortable in the same temperature ranges we humans are comfortable in.

If your house stays cold or very dry then you will have to consider glass or solid side enclosures to keep in the heat and/or humidity. Cages that have solid sides and back are useful in any environment to keep mist from spraying out of the cage.

The cardinal rule in enclosure environments is this: The bigger the enclosure the more temperature/humidity gradients can be created. Gradients allow the chameleon to take care of himself. The more your chameleon can take care of himself the less you have to worry.

When setting up your enclosure interior, have a number of horizontal perching areas linked by vertical or diagonal climbing branches. Branch diameters can range from where the chameleon can just encircle the branch with its foot to where it can get half way around. This provides a nice variety of arboreal pathways. Branches can be secured with zip ties, a hot glue gun, push pins through the screen, or Dragon Ledge supports which can hold potted plants as well.

Enclosure placement in your house is important. Avoid drafty areas and areas where they might be harassed (or just checked out) by other pets. Chameleons derive security from height so you can take advantage of this by placing the cage on a dresser and making the highest perching branch at least at your head level. **The height of the cage itself is less important than the height of the perching branch relative to the action outside the cage.**

When you are starting out there is no reason to put any soil, wood chips, or moss on the floor. A bare floor is easiest to clean and a substrate usually has little benefit for a chameleon.

Cohabitation

Although many sellers and, unfortunately, some breeders, will sell you a pair of chameleons and say they can live together, this is setting you up for potential trouble before you are ready to recognize it. Chameleons may not be aggressive in an obvious manner towards each other, but they do play power games and over time in this stressful environment the loser may grow up slower and with a weakened immune system. Early death is a possible result. Stress weakens the immune system over the long term so people do not connect the health issue with the cohabitation. Yes, people will claim they have done it. But don't do it yourself until you have enough chameleon experience under your belt that you can recognize the subtle signs that they are not getting along. Bring them together just for mating. All three of you will be much happier.

Lighting

Chameleons acquire several things from unfiltered sunlight: visual lighting, heat, and invisible ultraviolet (UVB) rays. Unfiltered natural sunlight is best for supplying these needs, but there are acceptable lighting solutions for indoor keeping.

Visual Light: A 6500K fluorescent bulb from any home improvement store will provide visual lighting needs. You will want to keep a bright environment for both the chameleon's sake and your enjoyment of the cage. T5HO bulbs are ideal in most cases.

Heat: A basking bulb can be as simple as a 50-75 Watt incandescent bulb. Place this bulb to ensure the chameleon cannot touch the bulb and that the chameleon can move in and out of the heat. Make sure you can hold your hand at the closest perch point inside the enclosure to the bulb without discomfort for a couple of minutes. Chameleons will burn themselves if the light is too hot! Except for large chameleons, a screen top counts as a perch point. And, for Veiled Chameleon owners especially, take into account the top height of your veiled chameleon's casque! Chameleons will burn their back and heads trying to warm their body. Remember that they have no concept of the "sun" being close enough to burn them!

UVB: A sufficient UVB source is critical. Currently, linear fluorescent T5HO lighting technology is the most effective. Whichever bulb you get, read the specifications and make sure you place perching branches in the effective range. UVB will not pass through window glass so even if your chameleon gets a comfortable morning warm-up with sunlight through a window they are not getting UVB for their bone development. UVB allows your chameleon to manufacture his own Vitamin D3.

An effective UVB set-up is to use an Arcadia 12% UVB T5 high output linear fluorescent bulb in a dual bulb fixture with a 6500K natural light bulb placed on the cage screen top panel shining directly on the basking branch 9" away. You may use a 6% bulb if it is in a single bulb reflector.

Night Lighting: Though red or blue lights are often sold with chameleons for a night light, do not use them at night. The light will disrupt your chameleon's sleep.

Timing: Appliance timers can be used to automatically turn on and off your lights. A 12 hour on/off cycle is a good start for daylight and your basking bulb can be timed off if afternoons are warm in your home.



Chameleons will enjoy basking in natural sunlight



This male Veiled Chameleon has been severely burned on his back and casque. The gray areas are burns.



This male Jackson's Chameleon (T. jacksonii xantholophus) is rehydrating after being shipped to its new keeper.

Watering

The greatest husbandry challenge of chameleons is keeping them well hydrated. Living in trees, they have not developed recognition of standing water. A bowl of water will most likely be ignored. You will need to provide a daily misting of the leaves and a water drip. Chameleons will drink the water droplets off the leaves. At a minimum, watering may be done by hand with a spray bottle misting the leaves or by poking a small hole in a cup and placing it, full of water, on top of the enclosure. Make sure it takes at least 15 minutes for the cup to empty. The most reliable and recommended hydration method is an automatic misting system.

Observe your chameleon drinking. If a chameleon rushes in to get water then the chameleon is probably dehydrated and you will need to ensure that your watering sessions are either more frequent and/or longer. Spray in the morning and evening, at a minimum, with the drip going during the day.

The best investment you can make is an automated misting system!

Hydration is critical to the chameleon's health. Do not cut corners in this area.

Feeding

The common staple food of captive chameleons is crickets. These are available at most pet stores that sell reptiles and they come in many different sizes. A standard community guideline on cricket feeder size is to feed the chameleon crickets that are a length equal to the distance between the ends of the chameleon's eyes. You will see them chomp down larger insects, but err on the side of smaller. You can't go wrong with feeding a few small items versus one large item that may intimidate or even fight back.

With only one chameleon, your best bet is to buy crickets and other food items (diversity is key for nutritional health) from local pet stores. Independent reptile stores are your best bet for good pricing and variety of food, but national chains such as Petco and PetSmart also carry insect feeders.

Babies and juveniles up to nine months can be fed every day. Up until the chameleon is full grown, and for gravid females, I feed as much as they will eat. Once they are full grown (and not gravid) I suggest five food items every other day. Crickets, and other feeder insects commonly available, are low in calcium so supplementation, as described in the nutrition section, is important.



A male Usambara Three-Horned Chameleon (*Trioceros deremensis*) enjoying a snack. Even wild-caught chameleons will tame down to eat from your hand, though it may take time and patience on your part.

Feeding Strategies

You will need to offer food in a way that the chameleon will find the food. Most of the food items available to us are nocturnal (come out at night) and like to hide in the enclosure so they cannot be just released and hope that they will be eaten. You will have to hand feed, do controlled release, or cup feed. Hand feeding is where you hold the feeder for the chameleon to shoot at. This is great fun, but has the drawback that shy chameleons will either not eat or else they will not eat enough. Controlled release is where you release a feeder or two on the inside screen wall until the chameleon zaps them and then you release a couple more when the chameleon is ready. Cup feeding is when you put the feeders in a cup that prevents the insect from climbing out and place the cup where the chameleon can have easy access. I, personally, hand feed or control release the first two feeders and then cup feed the rest. This gives me the opportunity to observe eating each time to verify that the chameleon is looking and acting healthy.

What next?

Establish a routine. Make a schedule for feeding, watering, enclosure cleaning, sunning, and taking care of feeder insects. There is a lot of work involved in chameleon keeping, but it is manageable if each one of the tasks is scheduled out. Make no mistake, you have chosen a high maintenance animal! But if you dive in and do it right, you will be rewarded with a fascinating experience.



A superworm (*Zophobas*) has been released to climb up the cage side. This technique can inspire hesitant eaters. (Male *Kinyongia multituberculata*)



Most chameleons will take to cup feeding. These feeders are lightly dusted with a mineral powder. (Male *Kinyongia multituberculata*)

An avid chameleon keeper soon becomes an insect keeper. Even if you have one chameleon and buy ten crickets at a time from the corner pet store, you will learn bugs! This is the natural progression because, like with you, nutrition is critical to keeping a chameleon healthy.

Gutloading. Getting minerals, vitamins, and nutrients into your chameleon starts with gut-loading your feeder insects. This means that you spend a couple days feeding your feeder crickets/superworms/etc...with grains, fruits, and vegetables before feeding them to the chameleon. And, yes, a couple days of rehabilitation is usually necessary for your feeders. Chances are that the feeders you bought from the pet store were not fed well at all. If they are lucky they got some carrots for moisture. Unfortunately, if you feed your chameleon right when you get home with the insects from the pet store, then you are feeding your pet an empty shell devoid of what your chameleon needs to survive.

To combat malnutrition, place your feeders in a container and give them gutload to eat for three days. Then you can feel comfortable that when your chameleon chomps down he is getting what he needs. One of the first things to do is research gutloads. There are many recipes available and I'll give you a very simple introduction recipe to tide you over. Put the wet parts on one plate and the dry on another to avoid spoiling.

Wet: Collard greens, Carrots, Sweet potatoes, Apple slices

Dry: Wheat germ, bee pollen, dry nonfat milk, alfalfa

I make it a point to mix up my ingredients and cycle in oranges, squash, papaya and whatever is in season. Commercial gutloads are available and I cycle through these as well.

You will have to change out food frequently to avoid spoiling. With feeder insects, fresh food and clean holding bins are critical!

Supplements. Most of our feeder insects are high in phosphorus which creates an imbalance relative to the calcium in your chameleon. To combat this, commercial mineral powders are available which will provide more calcium and D3 to your chameleon.

Since every set-up will be different it is impossible to give a universal supplementation schedule. If you are buying a captive bred chameleon just ask your breeder for their recommendation of supplementation and UVB. With a basking branch that places the top of the chameleon within 6 inches of a T5 UVB bulb your chameleon should be generating enough vitamin D3 that you will be able to use a supplement that has no D3. It is common practice to give a chameleon calcium with D3 once every week or two just to make sure, but the ideal D3 "top off" would be a couple hours of natural unfiltered sunlight every weekend.

To supplement with a powder, place the feeders in a bag or cup with a small amount of powder, gently shake the bag/cup to lightly coat the feeder, and then feed it to your chameleon. Over supplementation can lead to as many problems as supplementation can prevent so do not think more is better and overdo it. Too little calcium and vitamin D3 will produce, among other problems, Metabolic Bone Disease (MBD). In MBD, bones do not have enough calcium to grow and harden. They can be "rubbery" and will break easily. This results in weak legs, broken jaws and curved spines. Too much calcium and/or D3 can create organ failure and edema (excess fluid in the body). The challenge with D3 is that if you go to a dietary D3 approach you are bypassing the chameleon's natural D3 limitation checks and balances. It is best to rely on UVB as much as possible for your chameleon's D3 levels.

Variety. Now we come to the part where things get interesting. Chameleons enjoy a variety of food. You will quickly find yourself learning about many insects. Typical chameleon keepers find themselves going through crickets, superworms (Zophobas), various species of roaches (dubias are most common), praying mantises, blue bottle flies, house flies, black soldier flies, grasshoppers, butterflies, silkworms, waxworms, mealworms, fruit flies, bean beetles, walking sticks, etc... Never doubt you are on quite the adventure!

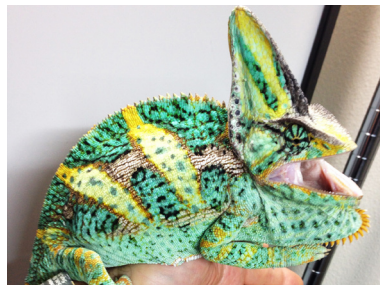


This cricket holding plastic bin has egg crates for hiding and a rich variety of wet and dry gutload

The most common species of chameleon in the pet trade are Panther Chameleons, Veiled Chameleons, and Jackson's Chameleons. These three are good to start off with because they are the best known and are commonly available as captive bred. The Jackson's Chameleon is also available as wild-caught, but resist a cheaper price tag when purchasing a chameleon that will be with you for many years if started in top health. There are many other species that come and go in the market. Which ever species you decide, do the proper research into their husbandry before you bring them home!

Veiled Chameleon (*Chamaeleo calypttratus*). Originates from Yemen, but are mostly found as captive bred. This is a great chameleon to start with because of its hardiness. As babies they are voracious eaters and fast growers. Please read the section on MBD extra carefully because of this! Veileds are colorful and have a dramatic casque. One thing that defines these chameleons is each has a distinctive personality. They can be very pleasant, very nasty or anywhere in between.

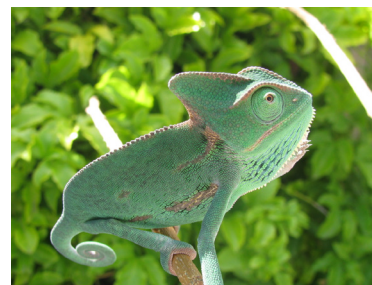
Target Ambient Temp range: day high = mid 80s; night low = high 60s to low 50s



Veiled Male



Veiled Female



Veiled Juvenile

Panther Chameleon (*Furcifer pardalis*). The panther chameleon, from Madagascar, is the king of color. There are many morphs which can range from pure blue to fiery red to a complete rainbow. They are intelligent and most are mild mannered. Captive bred panthers are widely available and make excellent pets. There certainly are individuals that never lose their crankiness, but most tame down readily.

Target Ambient Temp range: day high = low 80s; night low = low 70s - high 60s



Panther Male



Panther Female



Panther Juvenile

Jackson's Chameleon (*Trioceros jacksonii xantholophus*). There are three sub-species of Jackson's Chameleon. The largest and most common is the Yellow-Crested Jackson's Chameleon, originally from Kenya. Though, today, they are brought over from Hawaii where they escaped and established themselves. They are live bearing and females can mate and store sperm. I mention this only because you can have a female only and then be surprised a year later when you'll suddenly find 20 babies in the cage with her! Jackson's are high altitude chameleons and can easily take temperatures down to the 50s F if the next day is clear and warms to at least the 70s. They have consistently mellow and pleasant personalities.

Ambient Temp range: day high = high 70s; night low = low 60s to mid 50s



Jackson's Male



Jackson's Female



Jackson's Juvenile



This is What You Want!

You are looking for a chameleon with alert eyes scanning its surroundings and keeping a close eye on you. Eye turrets are full and round. The chameleon scampers around with its body held high or calmly surveys the situation with confidence. The tail is strong and active with no kinks or limp points.

If at all possible, watch the chameleon eat to verify the tongue is working. This is not always possible as the chameleon may be leery about his surroundings or just not hungry.



Warning

There are some things that are superficial and, **as long as they are healed**, the chameleon could be considered healthy. Babies raised in groups will sometimes have bite marks (a ring of black) or nipped tails. As long as they are clean, the bite marks should heal with a shed or two and the tail will be rounded at the end with no effect to the chameleon's life. Black rub marks on knees, back, nose, and head from shipping in a bag will shed out eventually, but tell of a rough handling.



This nipped tail is in the process of healing. If the healing is clean, a nub will be left.



MBD has caused a misshapen leg and jaw. Watch out for MBD in captive bred animals.

Avoid

Disqualify any chameleon whose eyes are closed. Closed or listless eyes and sunken-in eye turrets tell you something is wrong internally. Pass on inactive chameleons. A weak grip with any foot, kinks in the tail, or sickly yellow or black areas on the skin tell of internal damage that may or may not heal.

If there is any black on the nose make sure the jaw bone is not damaged. Check all four feet for a strong grip. Verify the tail is not limp in places.



The listless eyes, sunken eye turrets, and a weak left back foot are signs that this chameleon needs serious rehabilitation.



This rubbed nose has gone beyond the skin and has broken the jaw. Superficial rub will heal. The jaw damage is a vet visit.

WHAT IS YOUR CHAMELEON TRYING TO TELL YOU?

Though chameleons cannot speak to us, they are expressive animals. Chameleons communicate a great deal to each other and we can tap into that because much of it is a visual language within the light spectrum visible to humans. This communication, mostly revolves around defense, dominance, and mating.

Unfortunately, nature did not equip them for being a pet for us so if we want to bring them into our homes we must learn their language. We must also realize that they live a much different existence than we do. They are solitary animals with a social structure that revolves around mating. Where other humans are a comfort to us, other chameleons are either competition or potential mates to a chameleon. Animals smaller than your chameleon are prey and animals larger (like you) are predators that could eat them. We must be patient as we slowly override this natural programming and teach them that we bring food and having us around is a good thing. The first thing we need to do is to learn their visual language so we know what they are saying!

The young male Panther Chameleon below is showing the classic signs of feeling threatened. He does not have his adult colors yet, but he is flashing the brightest shades he has to make himself look as big and threatening as possible.

Mouth is gaping to appear threatening to bite. Note: This is not an idle threat.

Body is brightly colored and flattened out to look larger and impressive

Gular (under throat) puffed out to appear larger

Front foot pulled up into the "Chameleon Salute"



Behavioral Communication and Body Language

Your best source for information is your chameleon. They will let you know whether they have what they need or not. The trick, of course, is to speak their language. By learning the resting colors and relaxed body position of your chameleon you will be able to read their mood and frame of mind just by looking at them. Here is a list of common chameleon communications to us about their living conditions.

Signs of a Content Chameleon

A chameleon content with his surroundings and cage set-up will not move much. He will change perching branches throughout the day from his sleeping spot to the basking spot and to his day time perching spot. But will not spend much time moving around otherwise. In order to give them the contentment that comes with a feeling of security make sure your cage interior has a warm basking perch area as well as a perching area that is visually obscured such as underneath or behind a plant. Place the cage in a high spot to allow the chameleon to be above the action in the room. Excessive moving can be a sign of searching for security, food, or a mate.

Dark or Light Colors

When a chameleon has lost a dominance battle he will darken his colors to show submission. But darkening and lightening is also used for temperature regulation. Cold chameleons will darken their colors to soak up as much sunlight and warmth as possible. A hot chameleon will get as light as possible.



By just looking at this male *T. deremensis* you can tell he was content (body shape) until a recent event minorly annoyed him (light spotting). His bright lips show that it is mating season for him. The curled tail indicates he is inclined to stay put - for now.



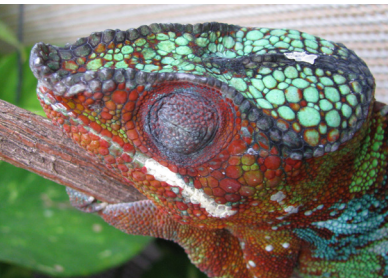
This *Bradypodion thamnobates* (Natal Midlands Dwarf Chameleon) goes as black as possible to soak up the morning sun warmth.



*This male *T. quadricornis* is testing out his new large enclosure by walking the perimeter. If he does not settle in after a day or two and continues to walk the walls then I need to change the cage set-up or location.*



Shown: Example of swiveling. Chameleons will eventually adjust to you and not swivel. Be patient!



Closed or sunken eyes and sleeping during the day are serious wake-up calls that something is wrong!



This female panther chameleon is in the final stages of a shed.

Climbing the walls of the enclosure

This behavior is exhibited by chameleons that want to find a better place to live. In the beginning, the chameleon is just exploring its new world. The wall walking should subside after a couple days of being in its new home and your chameleon should settle in on the perching branches. If not, then consider if you have enough suitable perching branches (placement and diameter) or not enough of a hiding area. The enclosure could also be too small, too hot, too cold, in view of another threatening chameleon, etc... There are many possibilities and you will have to be smart and creative to figure out which one it is.

Although screen walking is the most common sign of a discontent chameleon, there are times when this is to be expected such as

- 1) For a few days after a chameleon is introduced to their new cage
- 2) It is breeding season and they are looking for mates
- 3) A gravid female is looking for a place to lay eggs or give birth.

Usually, though, screen walking is because the cage is not adequately set up, is too hot/cold or there is something in the surrounding environment that makes them uncomfortable.

Swiveling to put their branch between you and him

This is done by shy chameleons to protect themselves from the big hairless ape they fear will eat them (that's you, by the way). This behavior will subside, but signals that they would feel much better with more of a hiding area (such as a lush plant) while they settle in with you.

Closed eyes during the day

BIG warning sign! Healthy chameleons do NOT sleep during the day. This a first sign of trouble which could be caused by excessive stress or internal illness (parasites or infection). A vet visit and fecal check (ask your vet) can help you determine the cause as either parasitic or environmental. In humans, closed eyes around another is security, trust, and affection. Chameleons are not humans. In chameleons it means sickness or stress. It is dangerous to interpret this behavior through a human view point.

"Play Time"

It seems obvious that a chameleon jumping off your hand or running away is a sign they want to get away. But chameleons are not fast runners and they know it. If you constantly corral them into a "play" area or on to your hand they will eventually stop trying to get away. This is not a sign that they are having fun or are now tame. This is a sign that they have given up trying to escape.

Chameleons do not play or seek to get out and get exercise. These are human needs we place on them. Play time is usually a source of stress for chameleons. They can get used to quietly sitting on your hand, but they have no concept of play.

Shedding

There will come a time where your chameleon will need to refresh his entire skin. This is called shedding. Over a couple of days the old skin will become white and then it will start to fall off. A healthy shed can be done in an afternoon. If old skin sticks to the chameleon or comes off in small pieces over days or even a week then there is an issue. Either the humidity is too low or else there is a health issue. After a shed, inspect your chameleon to make sure the shed is all gone around the feet and toes.

Shedding is a positive sign of growth. A shed that takes more than a day is a warning that something, perhaps humidity levels, may be off.

Signs of compromised health

Stress is the hidden killer of chameleons. The most likely cause of health issues is a weakened immune system caused by stress. When you get a warning sign, immediately study what could be physically or emotionally stressing your chameleon. Common stress causes: Another dominant chameleon in view, other pets hanging out by the enclosure, too much heat (via heat lamp or sun), not enough heat, a draft, large parasite load, and dehydration. Except the parasite load, nothing your vet can do will make up for these husbandry factors. Maybe you see your chameleon during morning and evening. What happens during the day? Does the AC come on? Does the sun blast in? Does your dog curl up by the enclosure until you get home? It is time to put on your detective's hat and get to the bottom of this mystery and QUICK! If you can't identify your husbandry issue then talk to your breeder or go to the online forums. There are many experienced keepers that will help you troubleshoot.

Understand that chameleons hide their illness very well. Once it gets to the point where you notice something, it has been going on for a while. If you don't act quickly then you are in danger of seeing a downward avalanche of health that neither you nor your vet will be able to reverse. Determine your husbandry issues and get your chameleon to the vet for fluids, antibiotics, or parasite medicine.

Remember: the medication may fix the symptom of the problem, but the problem remains and the symptoms will return if you don't fix your husbandry issue!

Sleeping during the day - Sunken eyes - Closed Eyes. Once again, chameleons do not sleep during the day or show affection by napping on you. This is a message to us that something is wrong. A chameleon sitting on its branch with its eyes closed during the day is telling you that there is something wrong internally. If it is not to block out external stress stimulus, it is a sign of internal discomfort which can be from a number of issues such as organ distress (dehydration will do this) or a high parasite load.

Nose to the Air or Gaping. Your first overt warning sign of a bacterial respiratory infection (often called a URI) is your chameleon with its nose to the air. The next sign is breathing with its mouth open. At this point, consider your window for getting your chameleon to the vet to be measured in hours, not days.

Too hot. A hot chameleon will show pale and washed out colors. They are trying to reflect as much light as possible to cool down. The next step is to open their mouths and gape. This is trouble. When they close their eyes while gaping and pale you have your sign that the heat stress has gone beyond the chameleon's ability to cool down and damage is being done.

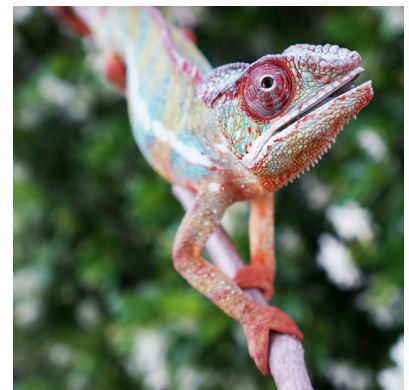
Too cold. A cold chameleon will be dark to try and absorb as much light as possible. Cold is not as dangerous as excessive heat. The important thing is to make sure they can warm up during the day.

Dehydration. Your chameleon's dry poop is the truest sign that he is not getting enough water. You may be spraying enough water in the cage, but he is not getting it if his poop is dry.

Losing Weight. Chameleons should gain or maintain their weight. A loss of weight is a red flag warning of internal distress - often a parasite load. You can monitor your chameleon's health by a weekly weighing. A little fluctuation is normal, but more than 5% weight loss should raise concern.



*This female *T. quadricornis* is sticking her nose in the air which is a tell tale sign of a respiratory infection. This will degrade into sunken eyes and open mouth breathing. Death will follow without quick veterinary care. You are NOT overreacting on this one!*



This male Panther Chameleon is showing signs of heat stress. His colors are washed out and he is starting to gape. The next step before death is the closing of the eyes. Get him to shade and water!



Hydrated poop



Dehydrated poop

If you are picking up a baby or juvenile chameleon, MBD needs to be a concern foremost in your mind. Metabolic Bone Disease (MBD) is the chameleon equivalent of rickets in humans. Very simplistically, this is where the bones do not get the calcium they require to harden as they grow. You end up with rubbery bones that result in the chameleon not being able to hold itself up, walk, shoot its tongue, or eat. A chameleon with MBD gone untreated will be disfigured and unable to care for itself. Advanced cases lead to death.

MBD occurs when your chameleon cannot get enough calcium from its food and/or not enough vitamin D3 turn the calcium present into a usable form. MBD is found mostly in captive bred chameleons raised in unhealthy conditions. If you are purchasing a baby chameleon then ensure that the baby can walk quickly across a stick with its body held high.

Getting calcium in the diet

The first issue is that many feeder insects, which are available to us commercially, have a low (or inverse) calcium to phosphorus ratio. This is a problem because calcium and phosphorus must be in the proper ratio (~2:1) within the chameleon’s digestive system to be of benefit. (This means at least 2 parts calcium to one part phosphorus.) A plain, commercially raised cricket bought from the stores is high in phosphorus and will actually create an imbalance with the existing calcium in your chameleon. To combat this we gutload our crickets and use mineral powders with calcium in them.

Making calcium usable

The interaction of calcium and Vitamin D3 is a complicated biological process that takes us from the skin to the liver to the kidneys. Finding the balance between not enough and too much of either is one of our husbandry challenges. Calcium is required for proper body function including bone development. Vitamin D3 is required for the body to absorb the calcium.

Calcium is obtained through diet while Vitamin D3 is synthesized from UVB rays hitting the skin. Vitamin D3 can also come through diet, but this is a minor source. The chameleon’s body naturally limits production from UVB, but there is no check and balance for dietary D3.

Veterinarian

One thing we tend to forget, until we need one, is to find a veterinarian that has experience with reptiles and chameleons in particular. Do not assume that all vets are able to effectively treat chameleons. Call around or, better yet, get involved in a chameleon group and ask hobbyists in your area who they go to. A good chameleon vet is a prize that the community will be eager to share. It is a wise idea to take your chameleon in for an initial check-up so you can get familiar with the vet and the vet can establish a baseline analysis of your chameleon for the records.

If your chameleon is wild caught then call your vet about getting a fecal sample done and clean your animal of parasites. It will drastically raise your chances of having your chameleon around for a long time. Also, when you are at your vet, ask them where you can obtain emergency services if you need help after hours. Have this phone number and address in a place you can find it. Remember, you will be looking for this number at a very inconvenient time and in a high state of excitement. Make sure it is easy to find!



This is a healthy baby Veiled Chameleon. Note how he can hold himself high above his branch and scamper away. A baby with MBD will not have the bone strength to do this. You should get the impression of agility, strength, and move-



This adult female Meller's Chameleon has an advanced case of MBD. Notice how her spine and legs appear misshapen? Her bones developed poorly and now do not allow her to hold herself up or function normally. She has difficulty hanging on to branches and eating. Photo Courtesy of Asia Kauffman



A healthy adult Meller's Chameleon is shown for comparison. She holds herself up on the branch and the strength in her grip can even make her painful to hold on your hand.

HANDLING YOUR CHAMELEON

As each individual chameleons has their own personality, it is difficult to tell how your chameleon will react. You can do some taming work, but it is not fair to be disappointed in your chameleon if he does not live up to your holding expectation.

You may have heard that chameleons don't like to be held. That is generally true. But chameleons do tame down, in most cases, to where the occasional handling will be no problem. Some exceptional chameleons actually take very well to handling, have lost all fear of humans, and are content being perched on their owner's shoulder for a walk. These are exceptionally rare. Please do not expect this of your chameleon. This section addresses only basic interaction with your chameleon.

First, we need to understand what a chameleon likes. A chameleon generally feels secure when 1) it can grab something, 2) when it is at the highest point, and 3) when it is free walking on its perch. A chameleon is insecure when it cannot grab something with its feet and tail, when it is lower than the action, and when it is "captured" (i.e. in your hand). Your goal is to make your chameleon friend feel as secure as possible.

Important Note: A chameleon's feet and tail are very delicate and, as stated above, are always looking for something to hold or wrap around. When picking up your chameleon ensure 100% that the chameleon has released its grip with all four feet and the tail. It is very easy to break the delicate bones in the feet and tails by snatching him away too fast! Be aware that the feet and tail may be looking for something else to grab as you remove the chameleon out of the enclosure.

Ideally, you get a chameleon out of his enclosure by providing your hand as a climbing surface in front of your chameleon at his foot level. You use the other hand to coax the chameleon to crawl onto your hand.

Holding the Chameleon

As you handle your chameleon, especially new ones, be aware that a typical chameleon defense behavior is to drop out of the trees to escape a predator. Untamed chameleons may not just drop, but actively jump off your hand. You can tell the chances of the chameleon jumping by how hard it is holding on to your hand. It takes time and familiarity to work this out of a chameleon. If your chameleon keeps jumping off into space then he needs more familiarity with you being around and feeding him. Chameleons are smart and will get to know you with time.

If a chameleon is feeling threatened, but does not want to jump, you will very likely encounter the chameleon salute where he puffs up and one, or both, of his front legs will be drawn up. This is a "stand and bluff/fight" posture. They will puff themselves up to look as big as they can. Move slowly and be patient. Eventually, when the chameleon has gotten used to you this will go away. If this behavior is accompanied by swaying and a gaping mouth then beware - you are in danger of being bitten.

There are some aggressive individuals that will go for the bite. Chameleons do have teeth and can bite hard. Some chameleons will break skin and do damage. If you must hold a chameleon prone to biting then gently use a restraining grip. (See picture). It must be only firm enough to prevent biting or jumping. Protection comes from the position of your fingers behind the head, **not** from pressure on the jaws, which can harm the chameleon.

Chameleons will eventually lose their fear of humans. How long this takes depends on how calm you are and how well you avoid acting like a predator (in the chameleon's eyes). Move slowly and avoid coming at them from above (as a predator would). Chameleons are smart enough to recognize different humans and will learn which ones bring them food. If handling is an important part of chameleon keeping for you then be patient and very sensitive to your chameleon's comfort level. Go at your chameleon's pace, not your own.



Proper handling of a chameleon. (Trioceros melleri)



Chameleons will feel secure with their tail wrapped firmly around their perch. (Trioceros montium)



Most chameleons would rather bluff than bite. Most...



A gentle restraining grip safely contains this spirited female Veiled Chameleon. (Chamaeleo calyptratus)

This may seem like a lot to take on, and it is. This is actually only the tip of the iceberg! But as the very strong chameleon community will demonstrate, it is a passion many people jump into headlong. It is amazing what I know about life, health, nutrition, environments, entomology, construction, politics, and parasitology because of my involvement with chameleons. Some people will be content to have just one chameleon. Others will start to want to further their involvement with chameleons. The key is to ensure you do not get ahead of yourself and get in too deeply. There comes a point where you are now a slave to your chameleons and neither enjoying it nor able to provide adequate care. If you desire more involvement, focusing your energy will avoid a quick burn-out.

Breeding chameleons

The next step many take is to make a pair and try to breed chameleons. This is a wonderfully fulfilling and educational experience. The best advice I can give is to first get comfortable with a single chameleon while doing your research on breeding.

Collecting chameleons

We have all done it. There are so many incredible species of chameleons. How can you have just one? But this is where we fall into the trap of overextending ourselves. The best way to extend your collection is to do it slowly. Do your research on the species of your choice as different species require different conditions.

Conclusion

You have just had your crash course in chameleon keeping. But it is just a glance on the surface! If you have decided to go forward and get a chameleon, you have two assignments to get to next.

1) Research.

- Listen to the Chameleon Breeder Podcast on iTunes or online at www.chameleonbreeder.com. There is even a dedicated iPhone/iPad Chameleon Breeder Podcast app

- Study the back issue of the Chameleons! eZine at www.chameleonnews.com. It is the finest collection of chameleon community knowledge available.

2) Get involved in that chameleon community.

- www.chameleonforums.com is our oldest active forum. It has a good blend of beginners and experienced old timers.

- If Facebook is your speed, consider The Chameleon Enthusiasts which is a group that mixes advanced keepers, scientists, and beginners in a positive environment.

The chameleon community is made up of a very diverse group of people tied together by a passion for these mini tree dragons. It is a world that is rich with possibilities for personal growth and enjoyment. Jump in, make friends, and explore this incredible new world!



Here Be Dragons...



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Fourth Edition
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