

The Parson's Chameleon: Husbandry & Care

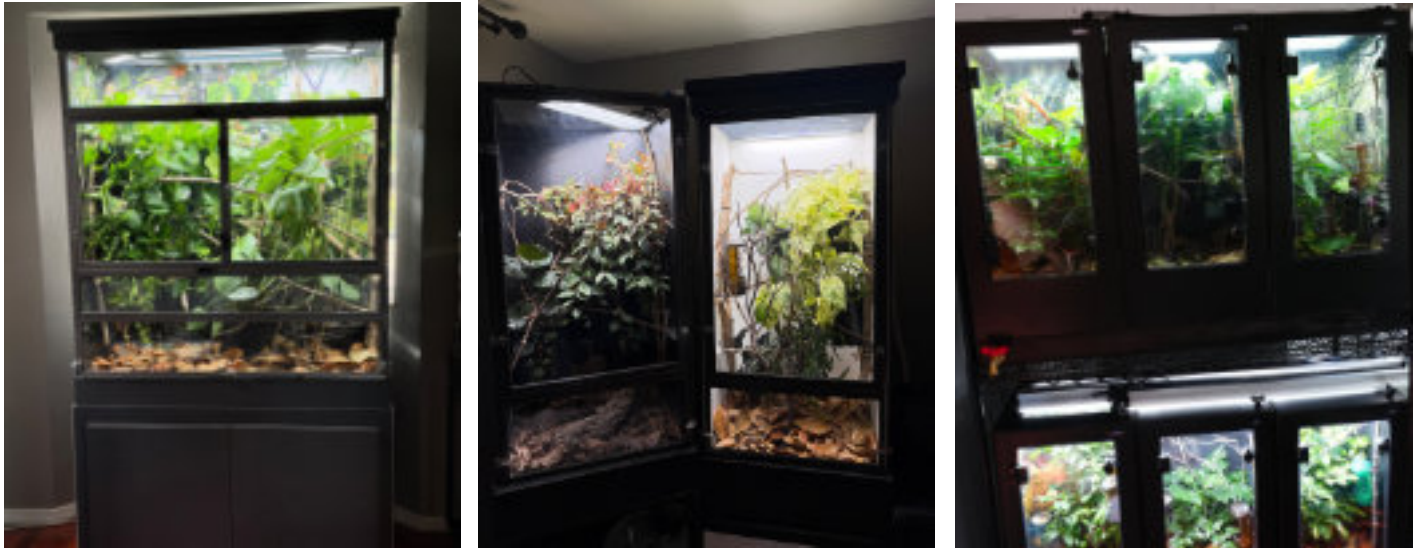


A Chameleon Academy Publication

Digital Edition 1.0, October 2026.

This book is free because of the Dragon Strand chameleon caging company.

Every cage sold funds the free education at Chameleon Academy, including this Parson's Chameleon Husbandry and Care book. If you are setting up for a Parson's Chameleon, the Large Hybrid Atrium and Crosscutts BioActive Stands and Cabinets you'll see in these pages were built around the husbandry this book teaches.



Dragon Strand is the company I created in 2013 to provide for the needs of chameleon keepers. Having my own caging company has allowed me to create products that further our husbandry. While these are commonplace today, it was Dragon Strand that introduced production hybrid cages, nursery cages, 4' wide cages, and Dragon Ledges to the chameleon community. The Crosscutts Bioactive Stands and Cabinets are the first combination of substrate tray, drainage tray, and stand for the chameleon community. Crosscutts is a company run by James Cross that builds Dragon Strand cage compatible bioactive stands and cabinets, in addition to additional cage possibilities and is sold on the Dragon Strand website.

Thank you for supporting the work and enjoy this free book download. I look forward to many long-lived Parson's Chameleons in our future!

Find the Dragon Strand and Crosscutts products at <https://DragonStrand.com>



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Parson's Chameleon Husbandry Summary

Calumma parsonii parsonii

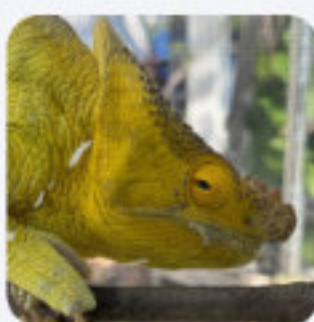
Males



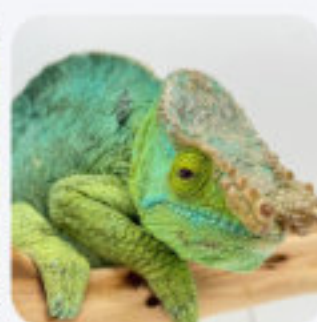
Orange-eyed



Yellow-lipped



Yellow Giant

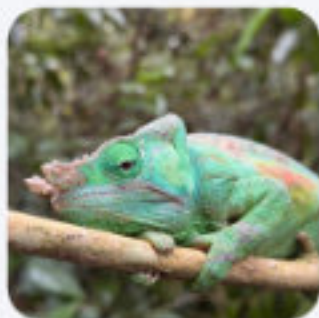


Green Giant

Females



Calumma parsonii cristifer



Male



Female

Cage Size

Minimum Retail <i>C. p. parsonii</i> :	4' x 2' x 4'	120cm x 60cm x 120cm
Minimum Retail <i>C. p. cristifer</i> :	3' x 2' x 4'	90cm x 60cm x 120cm
Up to two years old:	2' x 2' x 4'	60cm x 60cm x 120cm
Custom Build:	Use all available space	

Keep individually – One chameleon per cage
Main perching branch at or above your head level

Parson's Chameleon Parameters

Temperature

	Wet Season	Brumation
Day:	75–78°F (24–26°C)	60–65°F (16–20°C)
Night:	60–65°F (16–20°C)	50–55°F (10–13°C)
Basking	80–85°F (27–29°C) (optional)	None

UVI = 3

Humidity

	Wet Season	Brumation
Day:	50+% RH	50+% RH
Night:	80 – 100% RH	80 – 100% RH

Feeding

	Juvenile	Adult	Gravid
Feeders:		2–5	3–5
Freq:	ad libitum	every other day	Daily

Supplementation

Plain Calcium, once a week
Multi-vitamin once every two months



A male Yellow-lipped Parson's Chameleon, Indigo, enjoys a dubia roach for lunch

Introduction

What you have in your hands is the collected experience of the keepers and breeders in the Chameleon Academy community. Years of interviews, consultations, and back-and-forth with people working to understand the Parson's Chameleon.

This book assumes you are familiar with general chameleon husbandry. If any concepts require more depth, the ChameleonAcademy.com website provides support.

If you talk to more than one keeper, you will be comforted by the overlap in husbandry methods, but frustrated by apparent contradictions in care between them! This is simply because husbandry in one environment will be different than in another environment. The target conditions are the same, but the way we get to them is unique to our own environmental conditions. That is why this book gives you the reasoning behind each care parameter and not just the number. Use this book as your starting point, but as your skill grows you can use this information to fine tune the parameters to your environment.

The focus of this book is creating the right conditions in your own setup.

I keep Parson's Chameleons outdoors in Southern California, where the climate allows almost year-round outdoor keeping. But this doesn't match every keeper's experience. So the conditions presented here are cross-checked against circumstances very different from mine — fully indoor rooms in the Midwest, hybrid indoor/outdoor setups running through wide seasonal temperature swings, large collections in the heat and humidity of the American South, and rounded out by observations in Madagascar.

This book is a chronicle — a snapshot of where we are right now. Expect it to be revised in the coming years as husbandry continues to be refined.

My hope is that more keepers will develop their skills in keeping Parson's Chameleons with the purpose to firmly establish this species in captivity. This book has been made with that goal in mind.

Bill Strand
Chameleon Academy



Part One

Getting to Know the Parson's Chameleon

Before we get too far into husbandry, we need to know the animal! This part covers what a Parson's Chameleon is, what it requires of you, which one to choose, and how its life unfolds in the forests of eastern Madagascar.

IN THIS PART

This part rounds out our knowledge of the Parson's Chameleon natural history as it relates to captivity. Previous experience with other species of chameleons is very helpful, but this chameleon species has its own quirks to know.

PART GLOSSARY

Acclimation

Bringing a chameleon onto your calendar and into your conditions. For a wild-caught Parson's this means shifting from Madagascar's seasons to yours, which usually takes one to two years. It runs on the animal's schedule, not a fixed timeline.

Brumation

A seasonal slowdown triggered by dropping temperatures. The chameleon rests in one spot, eats little or nothing, and can go up to six months this way.

Diapause

A pause in egg development triggered by a cool period during incubation, part of why Parson's eggs can take 13 to 24 months to hatch. More than an adaptation to conditions, it becomes a timing mechanism that influences the hatching schedule.

Locale

A population from a specific area of Madagascar, usually named for its males' coloration: Orange-eyed, Yellow-lipped, Yellow Giant, Green Giant. These are considered the same species by science, but are treated as distinct by keepers and breeders.

Rostral Process

The horn-like growths on a Parson's Chameleon's snout. Prominent in males; absent in females. The most reliable way to sex a young adult.

Wild-caught (WC)

Collected from the wild in Madagascar and imported. Valuable for genetic diversity; requires acclimation.



Male Yellow-lipped Parson's Chameleon, Blue, in an outdoor, walk-in enclosure

Chapter I

Parson's Chameleons as Pets: The Reality

A Parson's Chameleon is a long-term commitment. Before anything else, it's useful to look at what that means in practical terms.

We can start with the obvious — they are large. An adult male *Calumma parsonii* runs 24–28 inches (60–70 cm) total length and can weigh well over 500 grams. The enclosure to house one properly will take space. My minimum recommended size is 4' wide × 2' deep × 4' high (120 × 60 × 120 cm) and many people go beyond that.

They are expensive. Captive-hatched animals run \$2,000–\$3,000 USD or more depending on age, and that reflects the difficulty of producing them. Breeders have invested years and significant resources getting to reliable captive reproduction. And it isn't just a one-time cost as larger feeder insects, electricity, and water are required. The costs add up.

They eat large food. Adult roaches, grasshoppers, large crickets, superworms, and silkworms are among the menu items. Although they will eat smaller, more common food, you do want to make each tongue strike worth it!

They require moderate temperatures and ample hydration. If your indoor temperatures climb into the mid-80s°F (29–30°C), air conditioning is necessary. Water is critical for their health and with the volume they use, a drainage solution must be designed upfront.

Over their estimated 20-year lifespan you will get to know them and their individual personality. Because of their extra requirements, they are a step up in commitment from the more common chameleon species. Whether it is worth it or not is up to your judgment as to what you are looking for with a chameleon.



Temperament & Handling

Parson's Chameleons are, generally, even-tempered. They do not enjoy being held, but will usually calmly accept their fate if brought off their branch. So Parson's Chameleons, like any other chameleon, are best looked at, not held. Though, there is still a real interaction to be had. They will recognize you and, assuming every interaction with you is positive (like bringing them grasshoppers), they will associate your face with good things. I get immense satisfaction seeing the excitement on their faces when they see their food-bringer (me) come into view!

"Parson's Chameleons, like any other chameleon, are best looked at, not held."

The reality of handling Parson's Chameleons! Their claws were designed for hard sticks — not our hands and arms!





Male Orange-eyed Parson's Chameleon from the Atsinanana region in Madagascar

Chapter 2

Types of Parson's Chameleons

At the time of this writing, there are two recognized subspecies of Parson's Chameleon, *Calumma parsonii parsonii* and *Calumma parsonii cristifer*. *C. p. parsonii* is the larger of the two and is what most people picture when they hear "Parson's Chameleon." Adults reach 24–28 inches (60–70 cm).

Within the *Calumma parsonii parsonii* subspecies, there are a number of recognized color forms that come from different locations. Note that the names assigned to these color forms are crowd sourced and not 100% effective in covering the wide range of colorations that can occur in one population. So, you can easily have different keepers refer to the same animal with different names and you can have a chameleon from a locale colored differently from what the narrow common name describes. There is also no official standard as to when another color form is warranted. These designations simply rise up within the hobbyist community. To add to the ID confusion, the females of the locales look identical and the locales can interbreed. Therefore, locale crosses can happen unintentionally within the breeding community due to inaccuracies in bag labels during the export process.

For the rest of this book, I will refer to the different types as locales rather than color forms. Even though we identify each locale by the predominant coloration of its males in our nomenclature, our goal in keeping bloodlines separate is, ultimately, to preserve the genetic pool of each place, not a particular color.

When selecting the locale or subspecies you are interested in, you can do so based on personal preference of color or size. There has yet to be a recognized difference in husbandry for the subspecies and locales. This may be because they are a species that can take a wide range of conditions or else we have not spent enough time to tease out the subtle differences. Though it should be noted that typical Parson's Chameleon enclosures tend to be larger with more gradients and micro-climates. So subtle husbandry requirements may be accommodated without being recognized.

As for potential crosses of the locales, it is important that you are sure of the lineage of your Parson's Chameleons if you ever intend to breed them. Do not intentionally cross the locales. Once the genetics are crossed we lose the ability to get back to the natural form. That said, inadvertent crosses are sometimes

available and if you are looking for a pet rather than a breeding project a cross-locale Parson's would make a wonderful companion chameleon.

The following pages show the adult males and females of each locale.

The Locales

The most common named locales of *Calumma parsonii parsonii* and the areas in Madagascar they are known from.



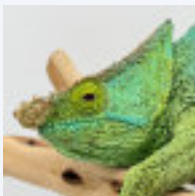
Orange-eyed — from the central eastern coast of Madagascar. Males show a bluish body with striking orange eye rings. This locale has also been called the White-lipped Parson's Chameleon.



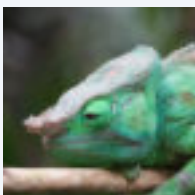
Yellow-lipped — from the Ranomafana region in Madagascar. Males show a blue body with yellow lips.



Yellow Giant — from the Vohimana area. Males show bright yellow coloration, but males from Vohimana show a wide range of colors, and it is not known whether those variations represent separate populations.



Green Giant — from the Masoala Peninsula in northeast Madagascar. These large green-bodied Parson's Chameleons are very rare in captivity.



Calumma parsonii cristifer — the smaller subspecies, from the Andasibe region. Adults can reach about 24 inches (60 cm) — larger than an adult male panther, but smaller than *C. p. parsonii*. *C. p. cristifer* has been bred in captivity successfully, though in smaller numbers than the larger subspecies.



Gideon, a suspected Orange-eyed × Yellow Giant cross, is a treasured member of James Cross's family. He will oversee future breeding projects, but not be part of them.



Orange-eyed Parson's Chameleon (male)



Orange-eyed Parson's Chameleon (female)



Yellow-lipped Parson's Chameleon (male)



Yellow-lipped Parson's Chameleon (female)



Yellow Giant Parson's Chameleon (male)



Yellow Giant Parson's Chameleon (female)



This photo spread shows Parson's Chameleons from the Vohimana area, where Yellow Giants come from. Males there sport a wide range of coloring.





Green Giant Parson's Chameleon (male)



Green Giant Parson's Chameleon (female)



Cristifer Parson's Chameleon (male)



Cristifer Parson's Chameleon (female)

TELLING THEM APART

Male



- 1 **Casque** — tall and pronounced
- 2 **Rostral processes** — the horny growths on the snout
- 3 **Coloration** — brighter; it gives the locale its name

Sexing a Juvenile

The rostral processes are the most reliable way to sex a young Parson's. They usually start to show at around six months and grow as the animal matures.

Female



- 1 **Casque** — lower than in males
- 2 **No rostral processes** — a smooth snout
- 3 **Coloration** — mostly an overall green, though there are variations

A MALE'S ROSTRAL PROCESSES GROWING IN



Hatchling (sex not yet visible)



Subadult



Young adult



Female Orange-eyed Parson's Chameleon from the Atsinanana region in Madagascar

Chapter 3

Male or Female?

Males and females are equally good animals to keep as pets. Temperament, manageability, and interest level are comparable across sexes.

Visual differences: Males carry the pronounced casque, rostral process ornamentation (the horny growths on their snout), and generally brighter coloration. It is from this coloration that they get their locale name (Orange-eyed, Yellow-lipped, etc.) Adult females are large but lack the prominent head structures of males and are an overall green color.

Housing: Both males and females do well with the same size enclosure and husbandry. Although the males do grow larger, the females are close enough in size that there is no difference in how they should be housed. Each Parson's Chameleon needs its own enclosure, ideally, out of sight of any others.

Reproduction: Parson's Chameleon females do not go through the constant development of infertile clutches that the more common Veiled Chameleon is famous for. But, it can happen. In captivity this can be as a result of females being near males or, as happened in my case, a mating that wasn't successful. You may also be the recipient of a fertile clutch if you bring home a wild-caught female. If you get a female you'll have to be familiar with the signs of a female wanting to lay eggs and provide an egg-laying site. Obesity can be an extra danger for females when it comes to reproductive issues. Enlarged fat pads are suspected of contributing to a dangerous dystocia (egg-binding) condition. Female Parson's Chameleons are wonderful pets and being prepared for their unique needs is easy. It boils down to keeping them at a healthy weight and knowing the signs of egg laying. A single unbred, pet female is unlikely to have egg laying complications.

The choice between male and female has a twist if you purchase a captive-hatched juvenile. It is difficult to know with certainty what the sex is until they start to grow their rostral processes. This might start at around six months old, but could be later. So, you have a chance of having either sex when purchasing a juvenile. Decide whether you can be happy with either sex before you buy a juvenile, or wait and buy an older animal at a higher price. Most breeders will try to work with you if you get the opposite sex from what you had hoped, but you have often already bonded with your chameleon and the breeder does not always have replacements on hand at any given time.



A male Parson's Chameleon reacts to the sight of an intruder

Chapter 4

Cohabitation

Cohabitation is when you keep more than one chameleon in the same cage. It is worth addressing with more explanation because this is one of the longest-running arguments in the chameleon community. We are fighting our human nature to pair things up in addition to wanting a larger collection than space allows. So we will be having this discussion for as long as humans try to understand the way other creatures live.

The exception to all of this is breeding, which is supervised, deliberate, and temporary. For the rest of this chapter, we will address cohabitation as the permanent living situation of two or more chameleons in the same enclosure.

Why Cohabitation Causes Stress

Let's address the obvious question: chameleons live in the same forest in Madagascar, so why can't they live together here?

Like all animals, chameleons have a social understanding. Sometimes they interact for mating or for defense of territory. And sometimes we find chameleons in the same bush seeming to get along. When we say chameleons are not social creatures we mean that they do not need companionship and will not sacrifice their space to have it like pack animals will.

Chameleons in the wild will tolerate another of their kind until they have reason to feel threatened, or until they decide it is time for the visitor to leave to a safe distance. But the other one may like where they are and does not take well to this original one thinking it is his territory. So the previous peace is now broken and we have conflict. It may happen the first day or it may happen in a week.

The thing is that, once it happens in a cage, the fight cannot end.

In the wild, when one decides it cannot win, it runs away. The fight is over when one of them leaves the bush. (You can see where this is going.) In a cage there is literally no way to leave the bush. The dominant one is stressed because it can never actually win. The submissive one is stressed because it cannot leave to stop the fight it has lost.

So the reason chameleons cannot cohabitate is not that they hate each other. It is that they cannot complete the social interaction they understand inside the cage

space we typically give them.

Why You May Not See It

Parson's can be stoic and avoid dramatics. To be sure, you often get quite a dramatic reaction between them when they see each other and there is no need to read a book to figure out that they are not getting along! The insidious part is when a pair of Parson's Chameleons settle into an uneasy silence where the signals of discontent sink below the keeper's skill level to recognize. And do not assume the male is the only danger. A female who tires of a male's attention can do real damage with her bite, and a larger female can bully a younger male.

We can easily identify stress spikes — a hawk passes overhead, a stranger puts a hand in the cage, a new chameleon comes into another chameleon's cage. We see the puffing, the gaping, perhaps even a lunge. Ironically, this is not the dangerous stress. Spikes come, get the adrenaline flowing, and then disappear. Living things are built to deal with stress spikes as a regular occurrence.

It is the chronic stress that kills. The low-grade pressure that does not necessarily have any external sign at all, but is constantly present. Chronic low-grade stress is measured in a slowly weakening body and immune system over months. What you see at the end of it is a chameleon becoming more and more lethargic until it is obvious there is a respiratory infection for, seemingly, no reason.

Then the illness gets blamed on the infection alone, and no credit is given to the husbandry that opened the door.

How long it takes for trouble to bubble up depends on the individual personalities involved, how big and how densely planted the enclosure is, and everything else that varies between one setup and another.

Can a Bigger Enclosure Work for a Pair?

More space is better for the chameleon in it — more choices, more gradients, more of the natural behavior you bought this animal to see. But what a second chameleon needs is a separate territory, and territory requires a lot of space.

My 8' × 4' × 7' (240 × 120 × 210 cm) walk-in was one territory. It was relatively large compared to the usual cages we use in the community. But, the animals in it are

two animals in the same territory. And, even with the densely planted interior offering many private spaces, they won't settle for staying away from each other. They can reach each other and that demands a reckoning.

So how big does an enclosure need to be before two Parson's can live in it comfortably? Obviously the answer is somewhere between 4' × 2' × 4' (120 × 60 × 120 cm) and the size of the island of Madagascar. I do not know where that point is. I do know it is not 8' × 4' × 7' (240 × 120 × 210 cm) or below. The take-away is, it takes less space to have two excellent single chameleon environments than it does one large environment where they can each have their own territory.

Line of Sight Counts Too

Chameleons are primarily visual. And seeing other chameleons counts as an interaction in their book. Provide a visual barrier between males and females. The sight of a male may simply stress a female, and keepers have had females produce infertile clutches from nothing more than seeing a male. Sight of a female may make the male restless and demand to escape his living space to go to the female. Two enclosures in the same room is fine. Just use a visual barrier.

Can't We Try?

It is natural to want to be the exception. Many of us came to chameleons because we feel a real connection with animals, and it is tempting to believe that connection will make cohabitation work. Put that love to a different use: fully accepting what they need. Chameleons, simply, are not animals that do well living with each other in the size of the typical enclosures we use. We can force them to cohabitate, and they may even look fine, because the warning signs are subtle. But we are not the ones paying for this decision. They are.

"It takes less space to have two excellent single chameleon environments than it does one large environment where they can each have their own territory."



Captive-hatched male Orange-eyed Parson's Chameleon

Chapter 5

Wild-Caught or Captive-Hatched?

Parson's Chameleons are legally exported from Madagascar and successfully bred in captivity, so you have options to consider.

If you are looking for a pet, then there is nothing like a captive-hatched Parson's Chameleon. Bonus points if you get one as a juvenile and are able to watch them grow into a massive adult under your care. There is nothing I enjoy more in my chameleon hobby than watching my chameleons slowly grow into their adult colors. It is true that wild-caught individuals are breathtaking. Having all of that glory immediately rather than taking time to raise up a juvenile may be tempting. But a wild-caught animal comes with a longer quarantine and acclimation. Those take skill, patience, and often veterinary money. Avoid that extra effort and risk if you can. This is potentially a twenty-year relationship, and the captive-hatched cost premium is worth it.

If you intend to breed Parson's Chameleons, then you can buy either captive-hatched or wild-caught chameleons. Wild-caught bloodlines are of high value to the community due to adding genetic diversity. The captive population came from imported animals and it will need new blood to stay healthy. Buying wild-caught also means you are now on the hook for a longer quarantine and acclimation. Take that on if you have the skills for it, and go in knowing the risks.

What Wild-Caught Involves

A wild-caught Parson's arriving in North America or Europe is oriented to a calendar that is opposite to what the seasons are in the Northern Hemisphere. In Madagascar, the warm wet season falls during the Northern Hemisphere's winter, and the cool dry season falls during our summer. Getting an animal onto the correct seasonal orientation typically takes at least one full year, often two.

Wild-caught Parson's Chameleons also arrive carrying parasites, potential injuries, and stress from collection and transport. They come in with a body condition that reflects whatever their last weeks or months in the supply chain were like. Some arrive strong and acclimate well. Others arrive having already sustained damage in collection and transport that cannot always be undone.

There is a middle-of-the-road option in an LTC, or long-term captive. This is a wild-caught chameleon that was imported a while ago. This means they have

gone through the initial quarantine and, depending on how long they have been here, have begun or completed the acclimation process. The LTC Parson's is a wild-caught with much of the work already completed. How much depends on the keeper, so ask when the animal came in and what has been done since.

The Bottom Line

So, you may ask, what should I do? For a pet it is worth it to wait until a captive-hatched juvenile is ready. For a breeder, wild-caught genetics are valuable for us, but I still recommend going the captive hatched route if unrelated pairs are available.

	Captive-hatched	Long-term captive (LTC)	Wild-caught
Best for	Both pet keepers and breeders	Both pet keepers and breeders, but check its history	Experienced keepers and breeders
Seasonal acclimation	None needed	Partly or fully done	1–2 years
What you gain	Watching it grow up	A head start on the work	New genetics for the captive population
Watch out for	Cost premium; sex uncertain as a juvenile	Ask what has been done since import	Parasites, injury, and transport stress



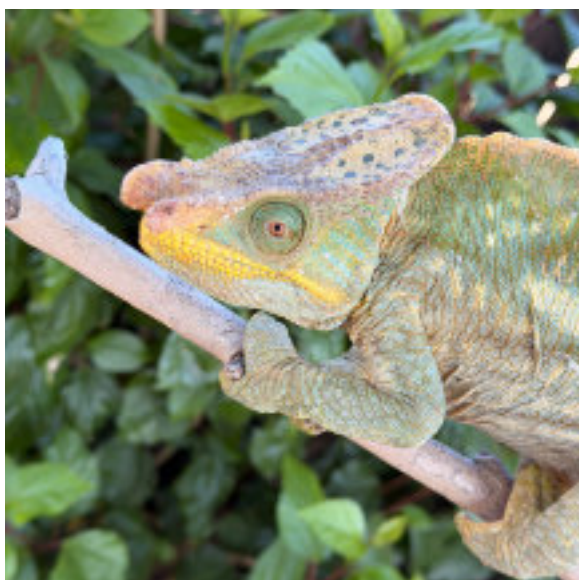
A captive-hatched individual gives you the opportunity to grow with your chameleon and bypass many unseen — and unwelcome — medical surprises.



WC Example 1: Cutie. This newly imported female Parson's Chameleon looked healthy from the outside, but a closer inspection on her mouth showed advanced bacterial infection, which necessitated the removal of her teeth. It was worth the veterinary bills and effort because Parson's are very strong and can bounce back from amazing things. But, in this case, after over \$1000 USD in vet bills, she did not recover.



WC Example 2: Stan. This newly imported male Parson's Chameleon, once again, looked healthy from the outside, but was hiding a condition that, even with veterinary attention, could not be fully identified before he spiraled downhill. This beautiful Orange-eyed male lost his battle with this internal condition. Working with wild-caughts can be rewarding, but go in with eyes wide open regarding the risks.



WC Example 3: Trouble is a long-term captive that was weak and gaunt upon arrival and has been difficult to diagnose. But he is a success story. Despite coming in weak, refusing to eat, and sitting with his eyes closed, he is growing stronger and stronger. This road will be long, but I expect him to have made a full recovery in another year of care. Wild-caught chameleons can come with expensive baggage to work through.



A long-term captive female Yellow Giant Parson's Chameleon

Chapter 6

Buying Your Parson's Chameleon

The Challenge of Finding a Parson's Chameleon

It may take a little effort to find a Parson's Chameleon. Parson's Chameleons are a cottage industry, and the people producing them, while excellent at breeding chameleons, might not spend the time on marketing. They often don't have to, considering people find them.

The most accessible source, and first to check out, is the reptile classified sites. That is where a new keeper might find their first Parson's, and it is also where importers surface. Importers tend to appear only when they have an import in hand and then go quiet again. Breeders post in online groups as well, but haphazardly, and you have to already be in the group to see it. Additionally, these announcements can be cryptically worded due to restrictions on animal sales on the major social media platforms.

What to Ask

If you do find a breeder or supplier, it is a good idea to get some basics about your chameleon. Here are four things I would ask:

Bloodlines. Where did the animal come from and who are its parents (if known)? The most important thing you need to know is how well documented the locale is. A suspected mixed locale is an excellent choice for a pet, but it shouldn't be part of any breeding plans.

Hatch date. Breeders will know. Importers can only say how long they have had them. For a wild-caught chameleon, age is only a rough guess. And once they are adults, there is no way to know.

Sexing confidence. Sexing a juvenile will be more feeling than certainty. The best you may be able to do with juveniles is accept the breeder's educated guess. But from young adult on, it is as easy as looking at the existence or absence of rostral processes.

What it is eating. Ask what they have been eating so you know what the chameleon is used to. This matters only if your chameleon arrives and decides to go on a hunger strike until they settle into their new surroundings. Knowing what they are used to eating may help snap them out of their funk. Though, most

chameleons bounce back from any uncertainty by the next day and are excited to try new food.

Shipping

Chameleons can be shipped via overnight shipping service. This allows you to get a Parson's from someone across the country. Though, because they are internationally regulated, they cannot cross international borders without paperwork that takes a great deal of time and effort. The non-negotiable instruction here is to have the package held at the shipping hub and go pick it up yourself.

The hub is where shipments arrive from the airplane early in the morning. The packages are then loaded into a delivery truck which will wind its way through the streets to finally drop it off at your home. The delivery truck is the most dangerous leg of the entire journey. That box has flown in overnight in a controlled, insulated environment, but for delivery it sits in the back of a delivery vehicle for hours, going in and out of the heat or the cold at every stop on the route, before finally arriving at your house. No matter how far away the hub is or how long it takes to get there, remember that it will be even longer for your Parson's if they take that journey in the delivery truck.

Almost any breeder or importer worth buying from is going to insist on hub pickup anyway. If for some reason they do not, you insist. Take the morning off work if that is what it takes.

Whatever warranties or live arrival guarantees are given to you, they do not bring an animal back. Pick your chameleon up at the hub.

One Final Check on Your Supplier

When you have located a Parson's that you are considering, check the breeder/importer/reseller for a digital history. The breeders and importers working with this species have been around for years and you can look them up. You may find podcast appearances, YouTube videos, forum posts, and people on social media sharing their experiences with this person. Someone who appears out of nowhere with Parson's for sale and no trail behind them deserves a cautious approach. It doesn't mean it would be a bad purchase. It just means it is worth a second look.

THE LAST LEG IS THE DANGEROUS ONE

From the Breeder to Your Door

1

The breeder ships

Your Parson's goes out by overnight service.

2

The overnight flight

The box flies in a controlled, insulated environment.

3

The shipping hub: pick it up here

Shipments arrive from the airplane early in the morning. Have the package held and go get it yourself.

4

~~The delivery truck~~

The most dangerous leg of the journey. Hours in the back of a vehicle, in and out of the heat or the cold at every stop.

5

~~Your door~~

Finally arriving at your house. The delivery person may or may not put in the effort to knock on your door and make sure you know your chameleon is there.

ASK THE SELLER

Bloodlines

Where did it come from, and who are its parents (if known)?

Hatch date

Breeders will know. Importers can only say how long they have had the animal.

Sexing confidence

For a juvenile, the breeder's best educated guess.

What it is eating

So you know what it is used to, in case it goes off food after the move.



Female Orange-eyed Parson's Chameleon from the Atsinanana region in Madagascar

Chapter 7

What We Can Learn from Nature

We have the fortune of being able to observe Parson's Chameleons in the wild and bring back observations that we can apply to our captive husbandry.

These chameleons occupy the mid-to-upper canopy of eastern Madagascar's rainforest. This is dense forest consisting of thick overhead canopy cover, high ambient humidity, and filtered light. They position themselves well off the ground, where height gives them both security and the ability to survey their surroundings.

There are four insights from observing them in Madagascar I would like to share with you.

FOUR INSIGHTS FROM THE FOREST

I Security

They stay high and in dense cover. Give yours hiding places and a main perch above your head.

2 Temperatures

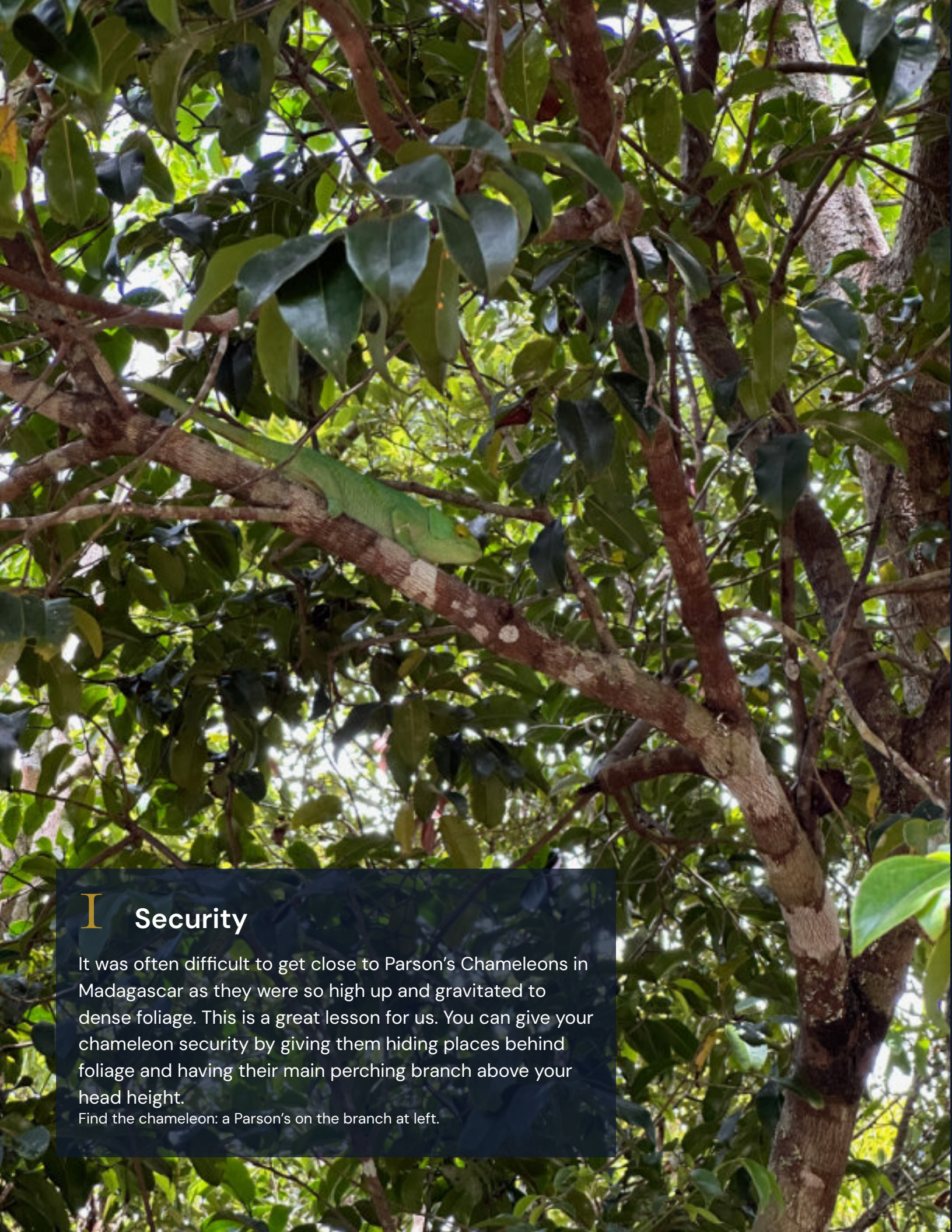
Inside the shaded canopy temperatures run much cooler than in the open. A weather station report does not necessarily represent their true conditions.

3 Humidity

Rain falls in every month in the east, so expect regular moisture year-round. There is less in the dry season, but it is not arid.

4 The Seasonal Cycle

Seasons drive brumation, breeding, and hatching.

A photograph of a green chameleon perched on a tree branch in a dense forest. The chameleon is positioned horizontally on a light-colored, textured branch, facing right. Its body is a vibrant green, and its head is slightly raised. The background is filled with thick foliage, including many green leaves and some brown branches, creating a complex, layered environment. The lighting is natural, with some areas of the foliage appearing brighter than others.

I Security

It was often difficult to get close to Parson's Chameleons in Madagascar as they were so high up and gravitated to dense foliage. This is a great lesson for us. You can give your chameleon security by giving them hiding places behind foliage and having their main perching branch above your head height.

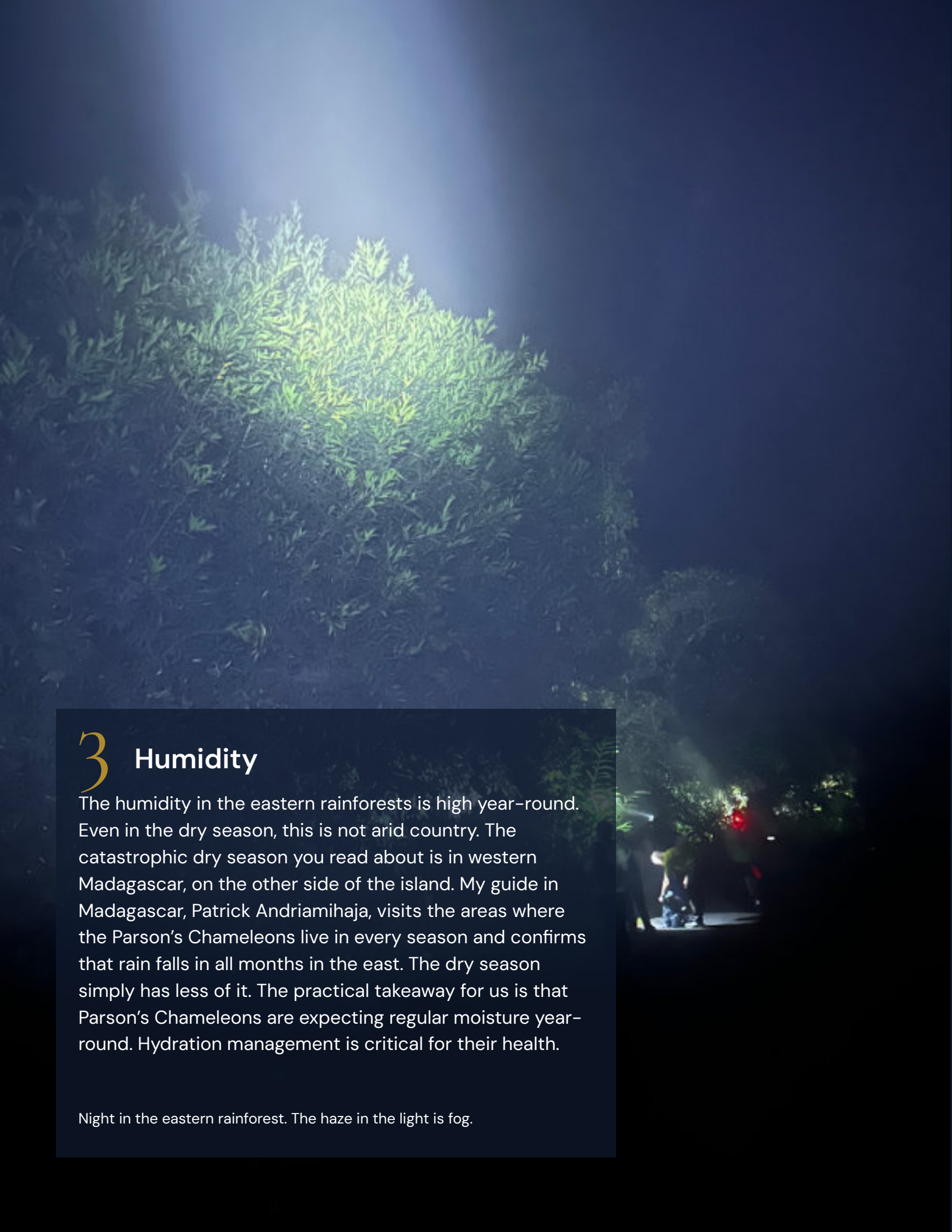
Find the chameleon: a Parson's on the branch at left.

2 Temperatures

The temperatures inside that forest canopy are cooler than a weather station reading will tell you. We love to check the weather in Madagascar using our digital apps. But context is critical. In Ranomafana, Madagascar, we measured temperatures in the 90s°F (32–37°C) in the open afternoon sun while a step into the forested area brought the readings down more than 10°F (about 6°C). Chameleons living in the shade of thick canopy are experiencing something considerably cooler. This is why our temperature targets for captive Parson's are cooler than what you may see on a weather app reporting on Madagascar.

An adult male Orange-eyed Parson's Chameleon in the shade of the canopy.



A night scene in a rainforest. A large, dense tree is illuminated by a bright spotlight from above, creating a strong contrast with the dark surroundings. In the lower right, a group of people is visible, with one person holding a red light. The overall atmosphere is mysterious and ethereal.

3 Humidity

The humidity in the eastern rainforests is high year-round. Even in the dry season, this is not arid country. The catastrophic dry season you read about is in western Madagascar, on the other side of the island. My guide in Madagascar, Patrick Andriamihaja, visits the areas where the Parson's Chameleons live in every season and confirms that rain falls in all months in the east. The dry season simply has less of it. The practical takeaway for us is that Parson's Chameleons are expecting regular moisture year-round. Hydration management is critical for their health.

Night in the eastern rainforest. The haze in the light is fog.

4 The Seasonal Cycle

Parson's Chameleons are tuned to the seasonal rhythms and these drive brumation (a seasonal slow-down), breeding, and hatching. For wild-caught animals and for managed breeding programs, attention must be given to acclimating them to your seasons or you must replicate the seasons they are used to.

A subadult male *C. p. cristifer* at night in Andasibe, Madagascar.



These observations help us provide the conditions they need to be healthy and live a long life.



A female *C. p. cristifer* is found sleeping in a tree in Andasibe, Madagascar





Female and male Yellow Giant Parson's Chameleons in captivity

Chapter 8

The Parson's Chameleon Life Cycle

The Parson's Chameleon is one of the more special chameleons to me because it represents a challenge that we as a community embraced. Its life cycle did not follow the pattern of the chameleons most of us started with, and it did not give up its secrets easily. Everything about the Parson's runs on a slower clock. It would not breed unless it had the right environmental cues and the incubation was not straightforward. So, where we are today is the result of a group of dedicated keepers and breeders not giving up.

Mating

Parson's Chameleons are slow from start to finish, and long-lived. If we jump into their life cycle at mating time we see the male giving a slow, methodical head jerking movement to woo the female. He attempts to position himself behind the female. If she is receptive the life cycle of our Parson's Chameleon starts here. With a successful mating, the female takes 3–4 months gestation time to develop her clutch and then buries the eggs in the ground. Reported clutches run from around 20 eggs in the smaller *C. p. cristifer* up to 40, or more, in the larger *C. p. parsonii*.

Incubation

Then comes the most challenging (for us) part of the life cycle — incubation. Parson's eggs get buried and appear to go through two seasons. Reported incubation runs from 13 months to 24 months. Breeders incubate the eggs with either one or two cool periods, called diapause. Both have produced hatchlings, and whether the second cool period is required is still unsettled.

So, the timeline has three to four months of gestation, a year or two in the egg, and then two to four years before the offspring is ready to breed. That puts you roughly five+ years out from a mating. That is the reason captive-hatched Parson's Chameleons are never plentiful and never cheap.

Sexing

Parson's Chameleons hatch without obvious sexually defining features and so we have to wait at least six months until the rostral processes (horns on the snout) start developing. As expected, sexing is more reliable the more they grow.

Parson's grow slowly. Experienced breeders say they are probably sexually mature at around two years. Three years is the safe number, and some breeders wait until four years old so a female is in the best possible condition for her first clutch.

Brumation

There is a curious behavior of the Parson's Chameleon where they slow down as the seasonal temperatures dip. We call this brumation. Brumation is a condition where the Parson's Chameleons go into a low movement state. They stay awake and are aware of their surroundings, but will hunker down in a place they feel is safe and have no interest in eating. Their eyes remain open and they watch you and the world. This can last six months out of the year. A Parson's Chameleon spends half their life resting!

Keepers have experimented with not giving a seasonal cool period for hatchlings to give them two years of uninterrupted growth and this appears to work well. It is a deliberate trade — you are giving up the natural cycle to buy growing time.

Current lifespan expectation based on captive experience is approximately 20 years with good husbandry. That is a number that is hard to feel until you live it. My oldest Parson's Chameleon, Blue, has been with me through four moves and two careers. He has seen the Chameleon Academy develop from a podcast into a multimedia outreach. He is going strong and there are many more life milestones he will see with me. He just got a mate so we will see what the future holds!

A PARSON'S LIFETIME

Slow to Start, Long to Live

From mating to sexual maturity

BEFORE HATCHING

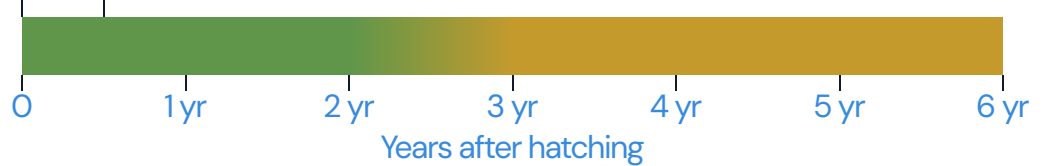
Mating



AFTER HATCHING

Hatch

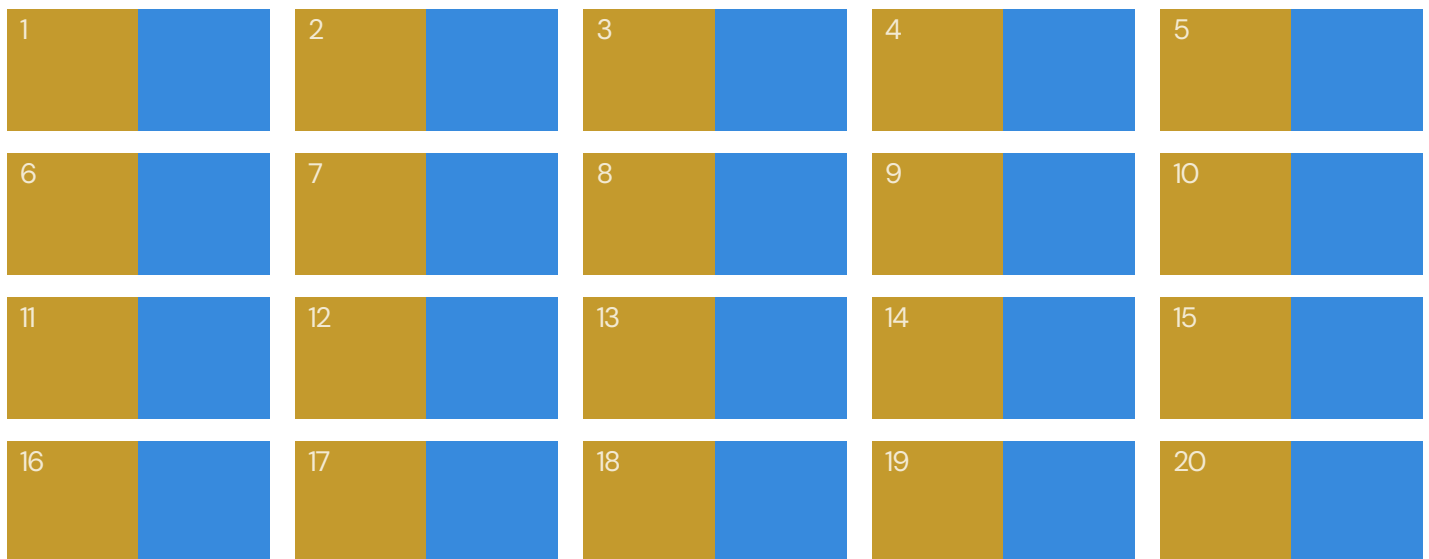
Sexable, ~6 mo



- Gestation, 3–4 months
- Incubation, 13–24 months
- Cool periods in the egg

- Sexually mature
- Sexually immature

A twenty-year life



Each block is one year: the active season in gold, brumation in blue. A Parson's can spend up to six months of every year resting.

"A Parson's hatched this year could still be with you twenty years from now."

EIGHT STAGES

The Life Cycle, Stage by Stage



1

Mating

A slow, methodical head-jerking approach



2

Gravid female

3–4 months to develop the clutch



3

Laying

About 20 to 40 or more eggs, buried



4

Incubation

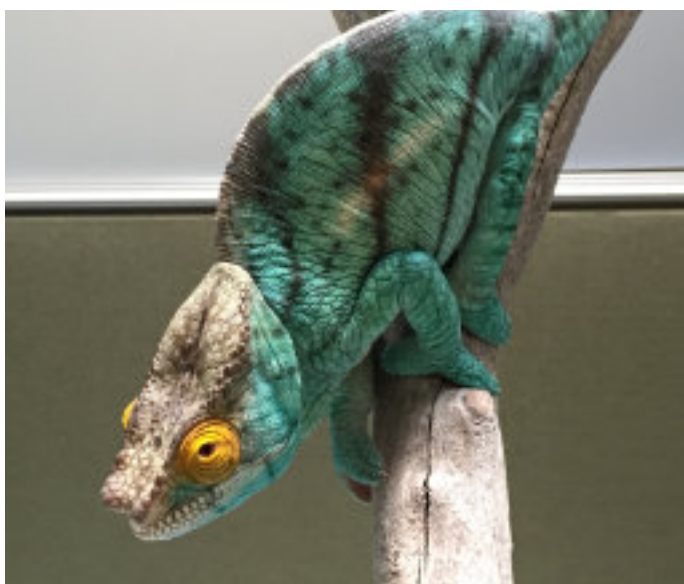
13–24 months, with one or two cool periods



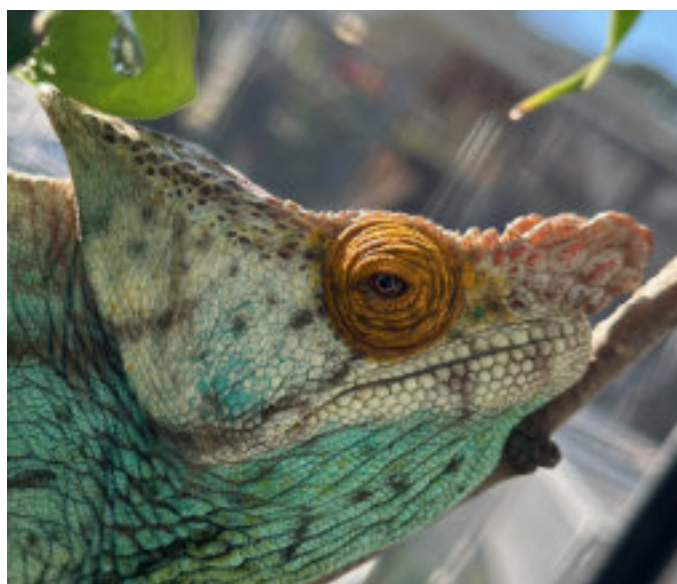
5 Hatchling
No visible sex features yet



6 Juvenile
Rostral processes from about six months



7 Sub/young-adult
Sexing gets clearer as it grows



8 Adult male



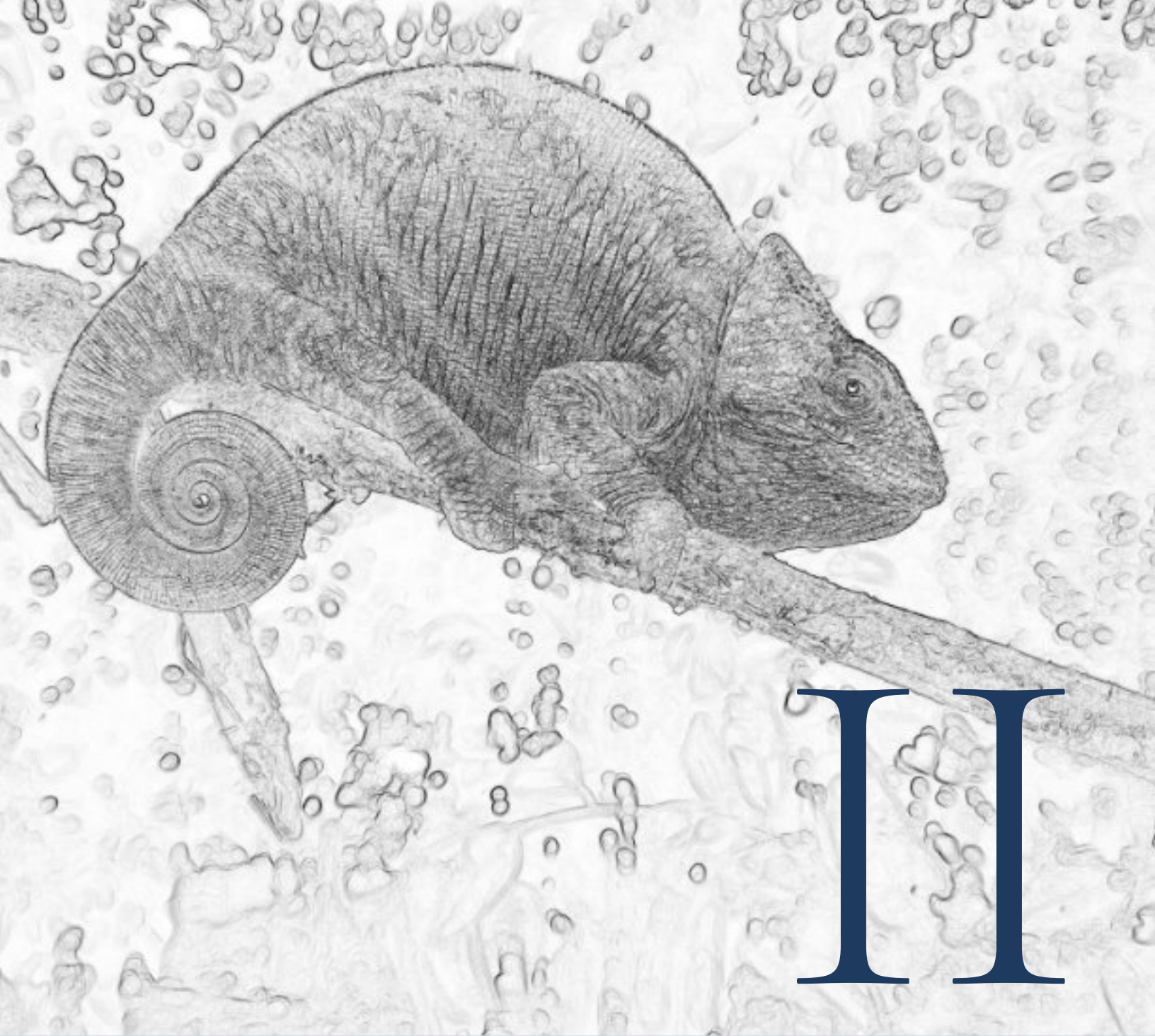
A brumating Parson's Chameleon. Their eyes are open and they are watching you.

Blue



Blue, my oldest Parson's Chameleon, has been with me through four moves and two careers. I got him ten years ago as a wild-caught adult.

"20 years with good husbandry...That is a number that is hard to feel until you live it."



Part Two

Housing a Parson's Chameleon

A Parson's Chameleon needs a big, humid, well-drained home. This part covers how large it should be, which type of enclosure suits your room, where all that water goes, and how to fill the space with plants and branches so your chameleon feels secure.

IN THIS PART

This part assumes you are building a permanent home. Any new arrival, captive-hatched or wild-caught, should start in a simpler quarantine setup first. Before you buy an enclosure, measure the humidity in the room it will live in, because that decides which type you need.

PART GLOSSARY

Active Drainage

A floor design where water flows out of the enclosure entirely, rather than being stored inside.

Bioactive

A soil floor with live plants and invertebrates. Often is created with a cleanup crew of isopods and springtails that breaks down waste.

Chimney Effect

Air warmed by the lights rises out the screen top and pulls cooler air in through the low vents. This creates a constant air exchange within the enclosure

Floating Garden

Mounting branches and plants on the enclosure walls at the height the chameleon lives, rather than growing up from the floor.

Hybrid Enclosure

An enclosure with solid sides and front, a screen top, and vents down low. Holds humidity while the chimney effect keeps air moving.

Survey Branch

A perch near the top of the enclosure where the chameleon can look down on the room.



Chapter 9

Enclosure Size

The enclosure size for a Parson's Chameleon is one of the big decision points before you decide to bring a Parson's into your life. Keep in mind, while we review appropriate enclosure sizes, that enclosure dimensions themselves are only part of the equation. The other part of the equation is how the inside is set up. Appropriately, you have this entire book that discusses all aspects of that endeavor! Like all chameleons, Parson's Chameleons must be kept separately. They should be together only for mating. So, everything being discussed here is for individually kept chameleons.

If you were to ask me what enclosure size I would recommend for a Parson's Chameleon, I would answer that with another question — how much space do you have? Because the real question is not how much space do you need to allocate to the chameleon. It is how many natural behaviors do you want to see and how much do you want to immerse yourself in the Parson's experience? Because there is a big difference between keeping a chameleon healthy and enjoying the full experience!

The Full Experience

The most enjoyable experience I have had with a Parson's Chameleon was when I was able to have a walk-in enclosure in my backyard. During the mild seasons it was a joy to just watch where Blue was in the enclosure and what he was doing. Now, most people will not have the ability to have an 8' x 4' x 7' (240 x 120 x 210 cm) walk-in enclosure in the backyard. But the more space you can give your Parson's, the more of the "Parson's Experience" you will get. As the enclosure gets larger they go from living with the basics to having more choices to make during the day. This is what enriches the chameleon keeping experience. And, to be fair, it is the same for any chameleon. But Parson's keepers tend to agree that there is just a different feel to working with these large chameleons. We may struggle to define the Parson's Experience, but we feel it. And, yes, chances are you will too. The larger the well-planted enclosure, the more of this experience is yours. The action item from this is to consider how much space you have and, if a commercial enclosure is not available in that size, look into making your own enclosure to fill the space.

True Minimums

I have been campaigning for enclosures that fill the available space so it might be whiplash that I am now going to be talking about minimum sizes. But every husbandry parameter needs bounds to be understood. Since there is no bound for how big the enclosure can be (your enclosure can be as big as Madagascar), I will discuss the lower bounds for each sex/subspecies.

These dimensions match enclosure sizes that are commonly available commercially. That is deliberate. A recommendation you cannot buy is not much use unless you are building your own. I have the advantage that I run the Dragon Strand chameleon caging company and am able to take dimensions and make sure there is a commercial product available!

Calumma parsonii cristifer, male or female: 3' × 2' × 4' (90 × 60 × 120 cm)

Calumma parsonii parsonii, male or female: 4' × 2' × 4' (120 × 60 × 120 cm)

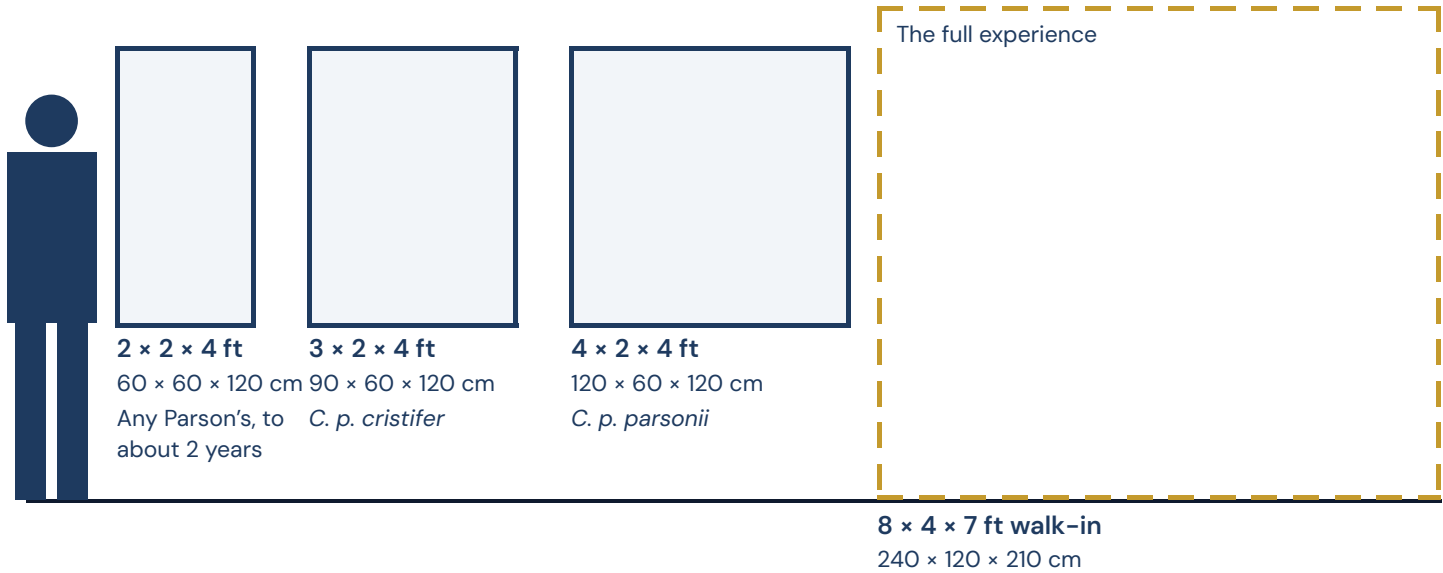
For completeness' sake, if you already have a 2' × 2' × 4' (60 × 60 × 120 cm) enclosure, any Parson's, either subspecies or sex, can live in it up to about 2 years old.

You will notice I am giving you an age rather than a weight or a length. That is on purpose. A cage that is too small is suspected (not proven) to slow an animal's growth down, so waiting for your chameleon to reach a certain size before upgrading could have a trap built into it — the animal that has not grown into the space may be the one most in need of getting out of it.

In the case where the chameleon is growing fast and you feel they might be getting cramped, don't question it. Go with that feeling and jump to the larger enclosure size.

Or else, just get a 4' × 2' × 4' (120 × 60 × 120 cm) or larger from the beginning, and there are no complications!

MINIMUMS AT A GLANCE



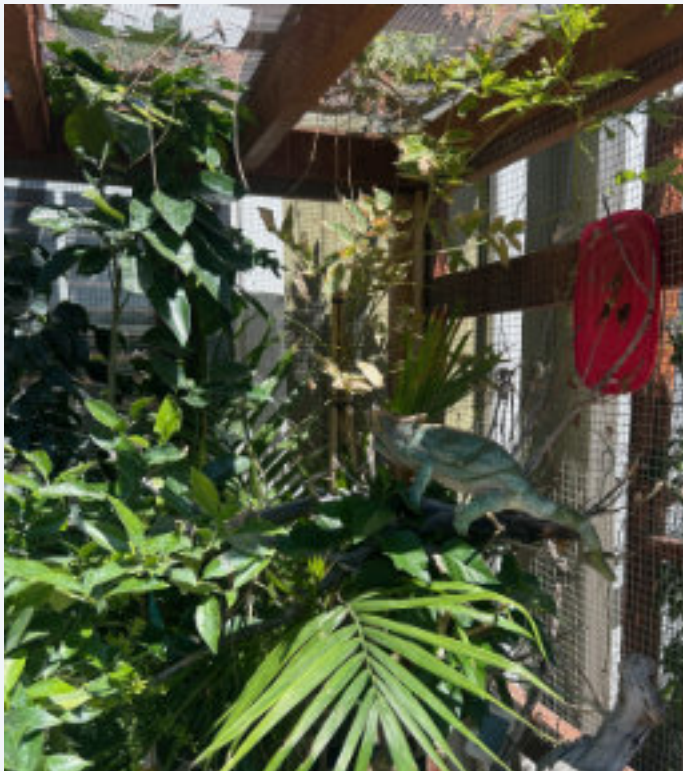
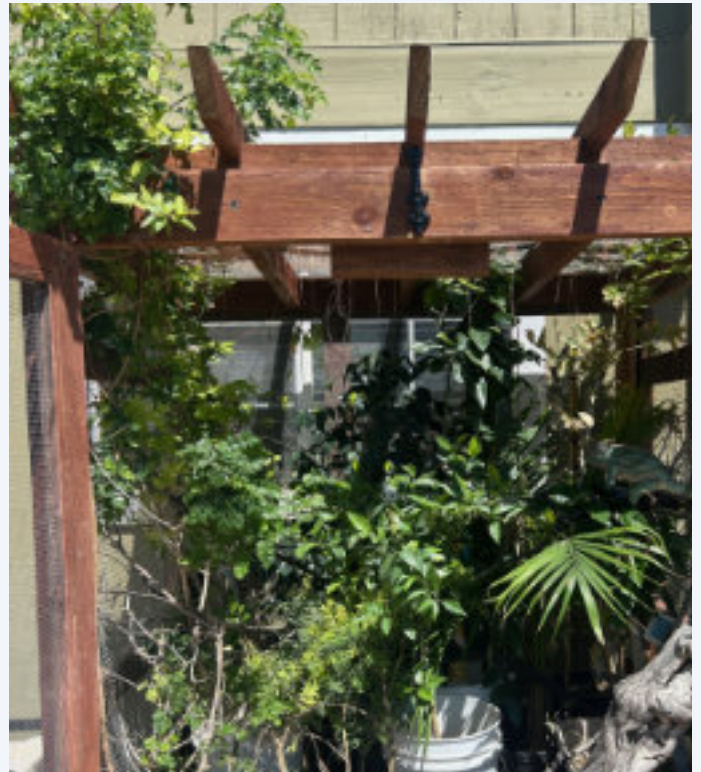
Front view, drawn to scale.

Height Matters

Remember that a chameleon's security, especially a canopy dweller like a Parson's Chameleon, comes from both cover and height. Place your enclosure on a stand so that the chameleon can perch on a branch that is above your head. The distance from the chameleon to the floor of its enclosure is not as psychologically important as the distance from the chameleon to the top of your head.



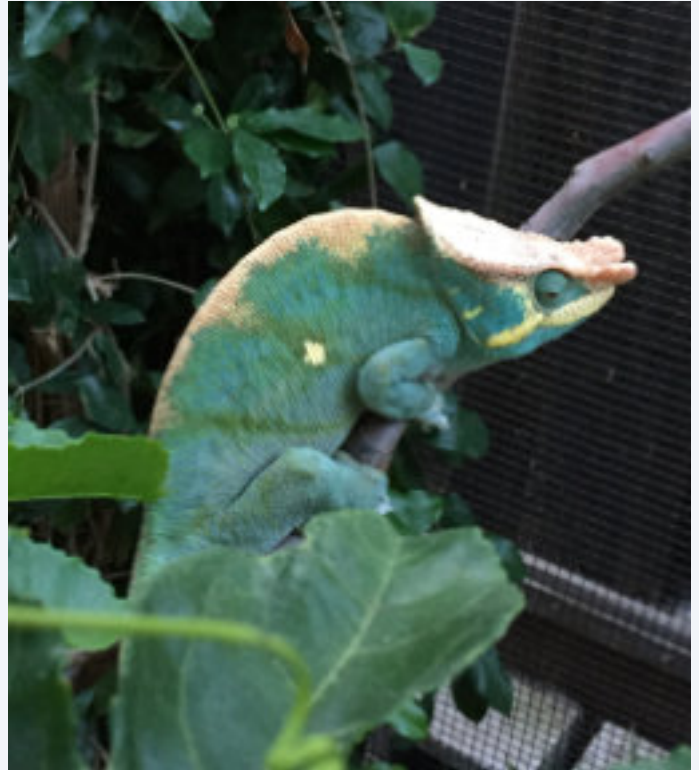
The Mobile Parson's Chameleon Outdoor Enclosure



This outdoor cage by James Cross is 5' x 2' x 7' (150 x 60 x 210 cm) and on casters for moving into direct sun during the winter and in shade during the summer.

Photos courtesy of James Cross

The Walk-in Parson's Chameleon Outdoor Enclosure



This fixed outdoor walk-in enclosure by the author (Bill Strand) is built directly on the ground. It measures 8' wide × 4' deep × 7' tall (240 × 120 × 210 cm). It is heavily planted with a sprinkler system.





Chapter 10

Enclosure Type

If you have been around chameleon circles any length of time you may have heard that chameleons need screen cages. That advice came from historical events I was, actually, part of. In the early days, we were working on how to be successful with chameleons. Keeping them in large screen cages gave us some real success. The problem with using this as a victory lap is that we were changing many things and the success was being reported from coastal Southern California where the Mediterranean climate was pleasant for many chameleon species. This wasn't a particularly good solution for someone in Ohio, for example. But screen cages had the other advantage that they were easy to build in the sizes that chameleons needed, so they took hold.

The problem is that all that ventilation fixed one thing and broke another. Another mantra you may have heard is that chameleons (especially Parson's Chameleons) are always thirsty. This is not surprising considering the low ambient humidity in many homes. We were having to mist frequently to hydrate them to make up for the ventilation that dehydrated them.

A screen cage does not hold humidity. Your chameleon lives in whatever conditions the room provides. And if you run air conditioning or heat, your air is having the moisture pulled out of it all day long. So here is what happens: you mist faithfully, you do everything the care sheet said, and your chameleon keeps drinking to maintain hydration. That approach has been made to work, but it doesn't have to be that hard if you use the cage construction to help hold in humidity.

Parson's Chameleons come from humid areas with ample rainfall and they have high hydration requirements. The enclosure is either helping you hydrate your chameleon or it is working against you every hour of the day that you have low humidity.

Which One Do You Need?

The correct answer for you is based on the conditions your room provides and the conditions your chameleon needs. Think of your enclosure as a husbandry tool because that is exactly what it is. Simply measure the temperature and humidity in the room where the chameleon will live (across day and night) and compare it to the levels in the care summary. Are they close?

If your room already sits close to the proper range during the day and night (within, say, 10% of the target), a screen cage is a good choice for your conditions. Otherwise, you are going to want more control over the internal conditions of the cage environment. And that is where a hybrid cage allows you the additional environmental control.

A hybrid enclosure is one with solid sides and front, screen top, and vents down low. That combination creates what is called the chimney effect: air warmed by the lights rises out the top and pulls cooler air in through the bottom vents. You get a constant, gentle airflow through the enclosure from bottom to top. The solid sides can be PVC, glass, or any other solid material.

Did We Trade One Problem for Another?

Restricting airflow allows us to hold in heat and humidity, but that raises concern about stagnant air. And this is a balance that is constantly on our minds. We will come back to airflow when we look at the environment.

If you are not sure which cage type is right for you, then the hybrid is most likely the best bet. If you live in an area that has the kind of humidity that justifies a screen cage, there is no mistaking it.

WHICH ONE DO YOU NEED?

1

Measure the room

Temperature and humidity, day and night, where it will live.

2

Compare to the care summary

Is the room close to the daytime targets?

Yes

A screen cage works.

No

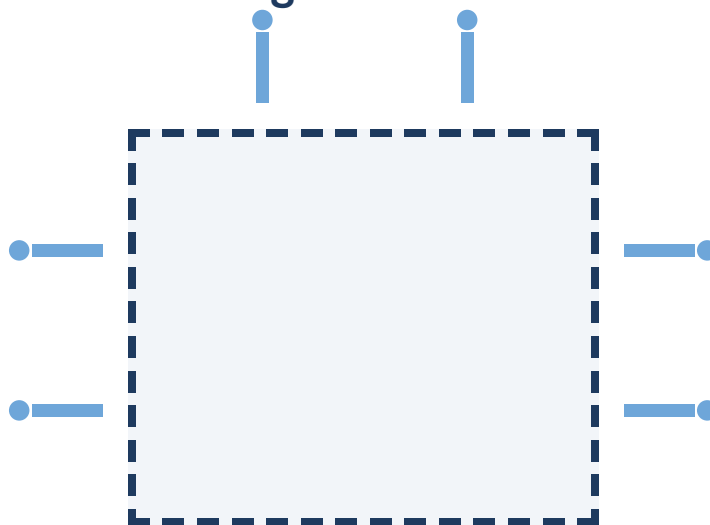
Go hybrid.

Not sure

Go hybrid.

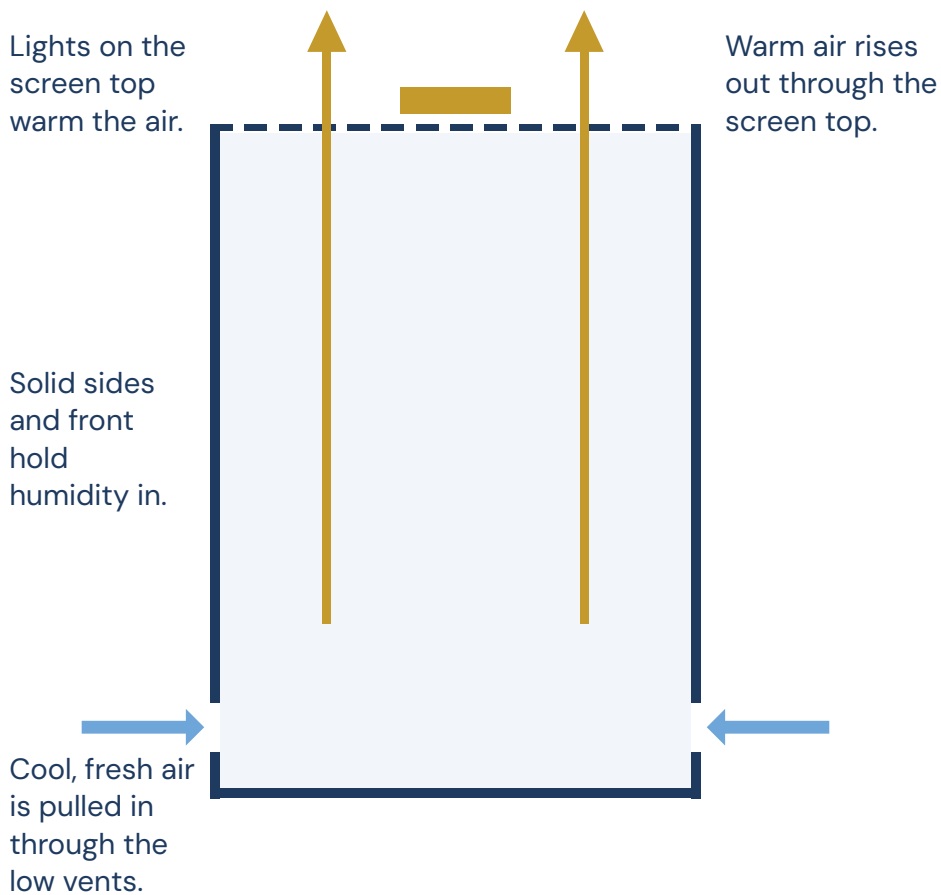
SCREEN OR HYBRID

The Screen Cage



Screen on every side: humidity escapes in every direction.

The Hybrid Enclosure Chimney Effect



The result is a gentle, constant flow of air through the enclosure from bottom to top, without the drying effect of screen on every side.



Chapter II

Drainage

Parson's Chameleons need a lot of water and the water that comes into the enclosure eventually goes out of the enclosure. Once the fog settles and the mist drips off the leaves, where does the water end up? One of the top aspects of cage setup most forgotten by chameleon keepers is a drainage solution, and it is critical to plan for this at the beginning!

Depending on how you split hydration between fogging and misting, a Parson's Chameleon can go through five to ten gallons (19–38 liters) of water a week. Fogging is the most efficient use of water and misting is the most effective delivery. Keepers all develop their own combination. That said, there is no combination of this where the amount of water is small!

It Is Also a Hygiene Problem

Drainage is more than just a hydration issue. There will often be poop on the floor and having a puddle of water forming around that poop creates conditions where pathogens and parasites spread. Parson's Chameleons rarely go to the floor, but escaped feeder insects do. All it takes is your chameleon catching sight of a feeder insect that just crawled through that puddle and your chameleon ingests the full dose of whatever was in it. Standing water plus poop is a combination you do not want in your chameleon's living space!

Plan It Before You Build

Drainage needs to be planned for up front. If you have not decided where the water goes, you will end up managing the puddle under your enclosure. This is rarely a bonding moment with your spouse. If you do not have a drainage solution you could be tempted to start thinking about how you can cut misting or fogging time to avoid the mess. That is the wrong approach with a species that has hydration requirements like a Parson's Chameleon.

What Kind of Floor Do You Have?

Parson's keepers deal with unique housing situations more often than most, because of the size of the enclosure and sometimes the custom nature of it. So before we talk solutions, we need to figure out which of these you are working with. If you are buying a retail enclosure, determine how drainage is handled before you buy. It is actually rare for manufacturers to have a solution, and most

leave it to you to discover you need one after the box is open and you have been using the cage. If you cannot determine the drainage solution from the product listing, call the manufacturer and ask. Here are the common flooring conditions you find in retail enclosures:

Loose floor panel. Common in screen cages or aluminum-framed cages. A floor panel lies on top of a floor frame. It is not watertight and water will seep around the edges. The water is leaving the cage on its own, which is, actually, what you want. Your only question is what catches it!

Screwed-tight walls. Common in PVC panel enclosures. The bottom panel screws into the wall panels and it is tight, but not watertight. It will hold water long enough for you to finish the build and then wonder where the drops on the floor are coming from. This one can go either way. You decide whether to help the water out with a drain or to seal the floor with silicone and keep the water in.

Sealed floor. Common in glass. The water is not going anywhere on its own. Whatever you do about it, you are doing it inside the enclosure or you are drilling through the glass bottom.

Three Ways to Solve It

Drainage tray. A drainage tray is a tray that sits underneath the floor panel and catches the wastewater. This is the easiest way to give a cage drainage because you literally just set the cage on top of it. The tray needs to be sized to the footprint of the cage, it needs sides tall enough to hold a few days of water without sloshing over when you bump it, and the cage has to sit on standoffs so the cage floor is held above the water that gathers.

That is the strategy I use with Dragon Strand enclosures. The tray is sized to the cage footprint and holds the cage above the water line, and the floor panel is screen rather than solid, so essentially all of the water leaves the cage environment instead of pooling in it.

If you have another type of cage that did not come with a drainage tray, you can build one. Replacement trays for large dog crates run up to around four feet (1.2 m) long and work well as a starting point, with lengths of PVC pipe laid down inside to lift the cage clear of the water. If your cage has a solid floor panel, drill

holes spaced out over the floor panel — especially under potted plants and any low spots where water pools. Make the holes big enough for water to flow through, but not so big that your feeder insects can crawl down through them. I recommend this even on a floor panel that already seeps around the edges. Speeding the water out is the whole point.

However you get your tray, you empty it by sucking it out with a wet/dry vacuum, plumbing it to a bucket, or letting it evaporate.

Drainage layer. A drainage layer is something you construct inside a sealed, watertight enclosure. You lay down a layer of LECA — lightweight expanded clay aggregate, sold as Hydroton or clay balls in the garden center — then a cloth on top of the clay balls, then soil on top of the cloth. The clay balls collect the water, the cloth keeps soil out of the water, and the soil above stays damp without saturating as long as you don't exceed the carrying capacity of your drainage layer.

If you have a PVC enclosure and want to go this direction, run a silicone bead along the inside seams first to make it a watertight sealed floor. On glass, you have the option of drilling a drain that empties to a receptacle outside the enclosure instead, but drilling glass is not a simple task and you should be well prepared before you take this on.

The limit here is the volume of water it can hold. A drainage layer holds a fixed amount of water and once it is full the drainage layer overflows and the soil saturates. This means it gets progressively muddy as more water is added. A drainage layer works when your weekly water volume stays comfortably under what the layer can hold, and with Parson's you really don't want your water input to be driven by what a drainage layer can or cannot hold. If a drainage layer is your only option, build in a suction port — a section of PVC pipe standing in one corner, open at the top and bottom, that you can reach with a crevice tool on a wet/dry vacuum. Pull the excess water out on a regular schedule and you have removed your limitation.

Bioactive stand or cabinet. The most robust option is a floor with active drainage, where the water flows out of the enclosure entirely and into a receptacle below. The enclosure sits on top of a substrate/drainage tray with

internal drains routing water down into a collection bucket, and the whole thing rolls on casters.

A Substrate Tray Is Not a Drainage Tray

A drainage tray goes underneath the cage and takes the water out of the cage environment. But if the tray goes inside the cage it is actually a substrate tray, which is designed to hold soil. Some companies sell substrate trays as a drainage solution, because a substrate tray is cheaper to build. But it is not a good substitute. A substrate tray keeps the water inside the cage. You would have to build a drainage layer inside one to make it work, with all the limits described.

The Point of All This

Drainage is a critical aspect of cage design and, as you can see, not a simple one.

Whichever approach you take, the goal is the same: you should be able to deliver as much water as your chameleon needs without thinking about where it goes. Remove that constraint at the design stage, before there is an animal in the enclosure.

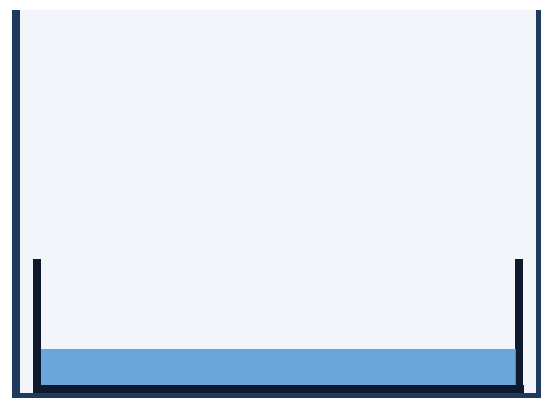
KNOW THE DIFFERENCE

Drainage tray: under the cage



Water leaves the cage.

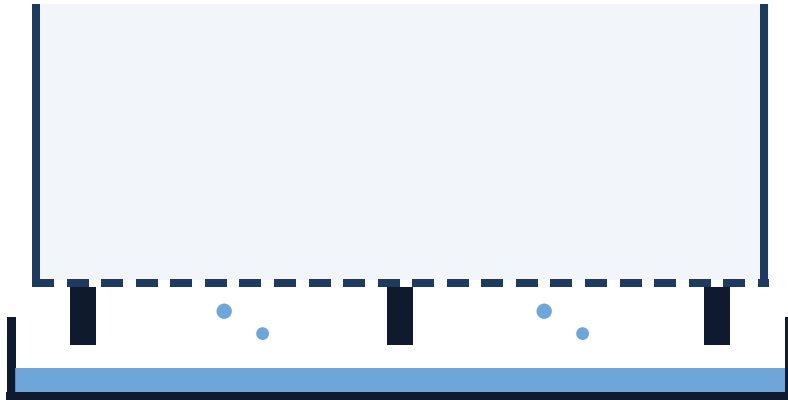
Substrate tray: inside the cage



Water stays in the cage.

THREE WAYS TO SOLVE IT

1 • Drainage tray

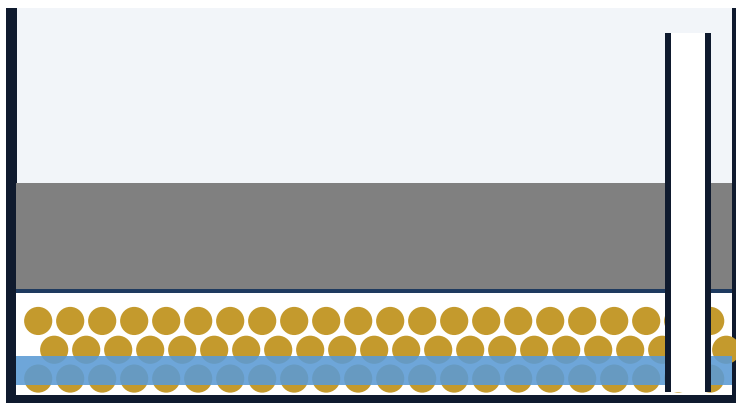


Screen floor: water drops straight through.

Standoffs hold the cage above the water.

The tray catches it. Empty it with a wet/dry vacuum.

2 • Drainage layer



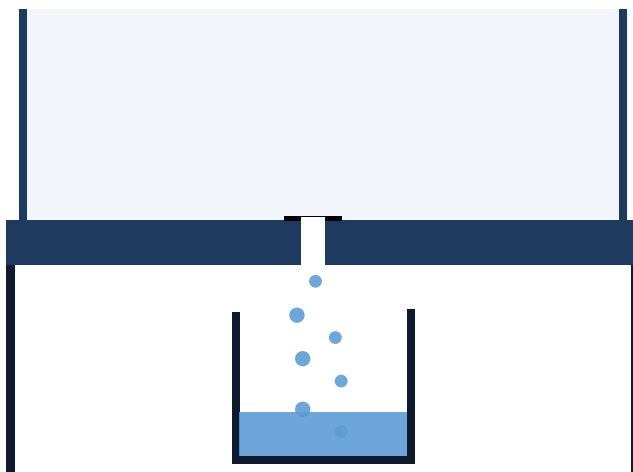
Suction port: pull the water out on a schedule.

Soil on top stays damp, not saturated.

Cloth keeps the soil out of the water.

LECA clay balls hold the water.

3 • Bioactive stand or cabinet



Substrate and drain tray at the base.

Internal drains route the water down.

A collection bucket below.



Chapter 12

Setting up the Parson's Chameleon Enclosure

The best way to explain how to set up an enclosure for a Parson's Chameleon is to have you come along on an actual build. I am building an indoor enclosure for my Yellow-lipped Parson's Chameleon, Indigo, who passed his quarantine period many months ago.

I am using the best equipment available for this build. But it is the concept that is important. If you use alternative equipment, use this guide to show what level of functionality is required.

Coming Out of Quarantine

With chameleons we are always on the lookout for parasites, and our husbandry assumes there may be parasites in our chameleon at any time. We also keep our chameleons individually. So for a chameleon keeper following best practices, coming out of quarantine really does not change much at all! It just means we relax how often we run fecal checks, and it opens up the option of a soil floor which, if we want it, can be a bioactive substrate.

I am choosing a soil floor for Indigo. That is a personal choice for this situation. Soil floors are not required and they do not have to be intentionally bioactive. But if you have a soil floor and you put in live plants and leaves from outdoors, it is almost certainly going to be bioactive whether you planned it that way or not!

[Indigo is getting a new enclosure!](#)



THE IDEA BEHIND THE BUILD

Three Ways to Plant an Enclosure

Before the first branch goes in, decide how the plants will be arranged. There are three approaches to consider.

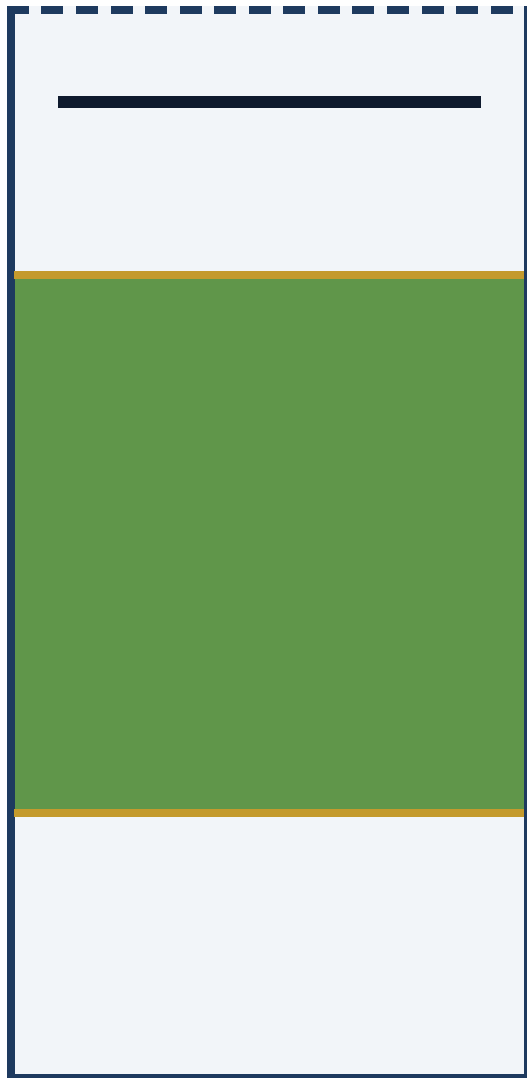
Planted floor. The plants go in at the bottom and grow up to fill the space. That takes large, mature plants that can start at the floor and fill the four+ feet above it, and it is often helped along by large pots that raise the plants and give them a head start. The result is a clean exposure gradient: the top is completely clear, and the lower the chameleon goes, the more shaded and covered it is. This is critical for an outdoor enclosure, which needs its entire height to create that buffer from the sun.



A planted floor in an outdoor enclosure: open at the top, shaded and covered lower down.
Photos courtesy of James Cross.

Floating garden. Indoor caging has relatively weak and localized heat sources, if any at all. So for an indoor enclosure, the floating garden is ideal. Dragon Ledges on the sides let you create a mid-layer of dense foliage and leave the top and bottom open.

THE FLOATING GARDEN IN A 4 FT (120 CM) ENCLOSURE



Open · top 9–12 in (23–30 cm)

Basking, UVB, and surveying happen here. The misters spray from the top and coat the leaves below with drinkable water.

Foliage · middle 24 in (60 cm)

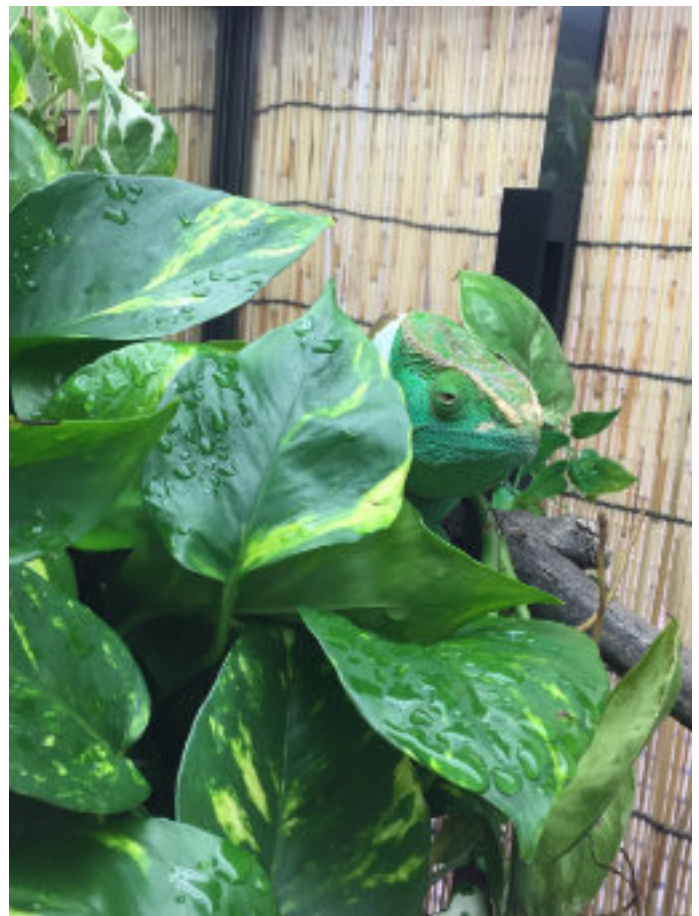
Vining plants create the hiding places for sleep and security.

Clear · bottom 9–12 in (23–30 cm)

Poop lands where you can collect it quickly, with little contamination of the sample.

It is excellent for quarantine and for a first setup, and it is the easiest approach to get right and to maintain long term.

THE FLOATING GARDEN



Branches and potted plants mounted on the walls, with open space above and below.

The combination. A Crosscutts BioActive Stand or Cabinet lets you have both, and it is what we will be building: the floating garden up above and a planted floor below. The combination is interesting because the mid-layer floating garden provides all the function the chameleon needs. That frees the planted floor to be whatever you want it to be: functional (a *Monstera* or an *Alocasia*), bioactive (a clean-up crew in the leaf layer), or decorative (plants that are there for looks alone).



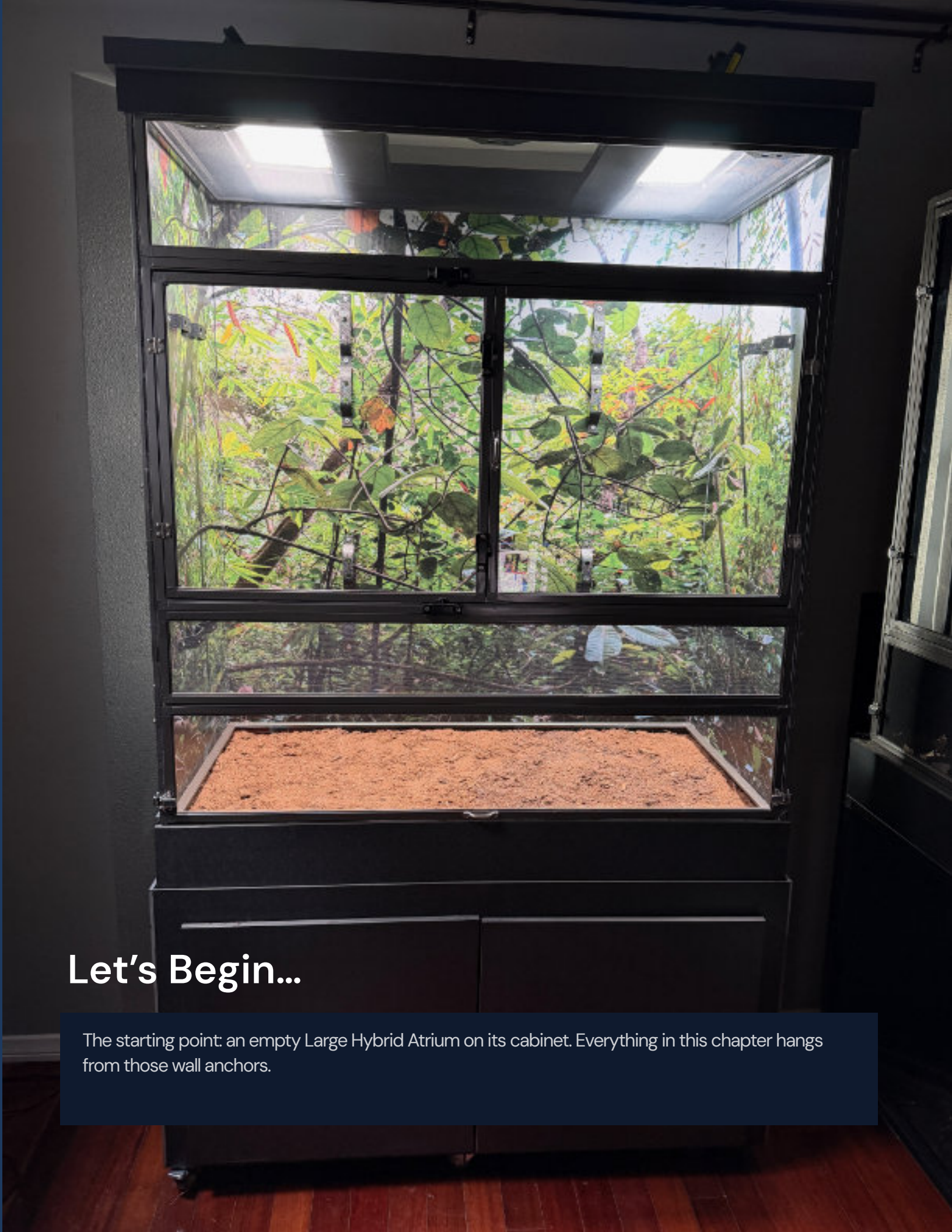
Two 2 × 2 × 4 ft (60 × 60 × 120 cm) combination setups: a floating garden above a planted floor. These are perfect setups for raising Parson's until they are two years old.

THIS BUILD

The Design: A Floating Garden Combo

The interior I am building is what I call a floating garden combination. I mount branches and plants on the walls at the height where Indigo lives, with a planted floor below.





Let's Begin...

The starting point: an empty Large Hybrid Atrium on its cabinet. Everything in this chapter hangs from those wall anchors.

THE ENCLOSURE · WHY I CHOSE IT

Dragon Strand Large Hybrid Atrium



Indigo needs a 4' × 2' × 4' (120 × 60 × 120 cm) enclosure that holds humidity without going stagnant.

- 1 **Dragon Ledges.** Mount branches and plants at any height on the walls. They are what make the floating garden possible.
- 2 **Three hydration mounts.** They take standard MistKing mist nozzles, right where the mist needs to come from.
- 3 **Fogger input.** The fog comes in and fills the space. This adapter is for common foggers.
- 4 **Two floor panels.** Screen and solid PVC, so the floor matches the setup.
- 5 **A fitted drainage tray, standard.** You do not need it on a BioActive Stand or Cabinet. But if you are buying just the cage, it matters: a drainage solution is hard to find!
- 6 **1/4" tubing entry.** Run a drip line to your plants.

THE STAND OR THE CABINET

Crosscutts Large Atrium BioActive Stand or Cabinet

The enclosure has to be elevated so the top perching branch sits above my head height. That is for Indigo's sense of security. A Parson's feels safer when they look down on us.

Crosscutts makes this base in two versions, and I had the choice between them. The stand is a metal frame on casters with a substrate basin sitting on top. The cabinet is an enclosed cabinet with two doors, also on casters, with the substrate basin on top. Both give you a 4.75" (12 cm) deep substrate floor, active drainage through internal drains, and a collection bucket underneath. I chose the cabinet for this build.



THE STAND

An open metal frame. Easier to reach the bucket, mister, and fogger.



THE CABINET

Two doors close it all in. It looks like furniture.

WHERE TO GET THEM

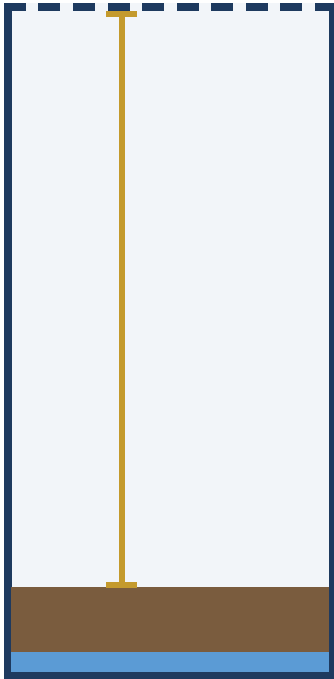
DragonStrand.com carries the Large Hybrid Atrium, the Dragon Ledges, and the Crosscutts BioActive Stand and Cabinet.

Find both Dragon Strand and Crosscutts products at <https://dragonstrand.com>

WHY THE BASIN MATTERS

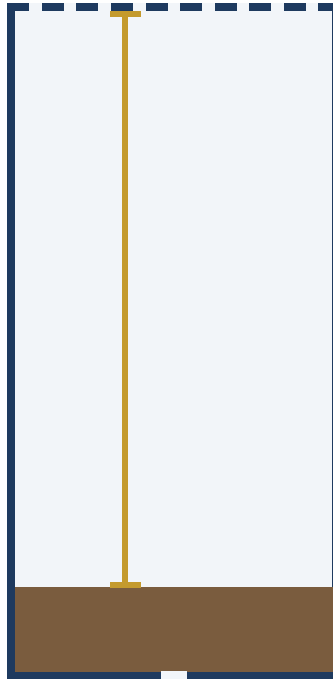
The Soil Floor Problem

A soil floor is a fun project to have, but the depth has to come from somewhere. Here are the three main options to choose from.



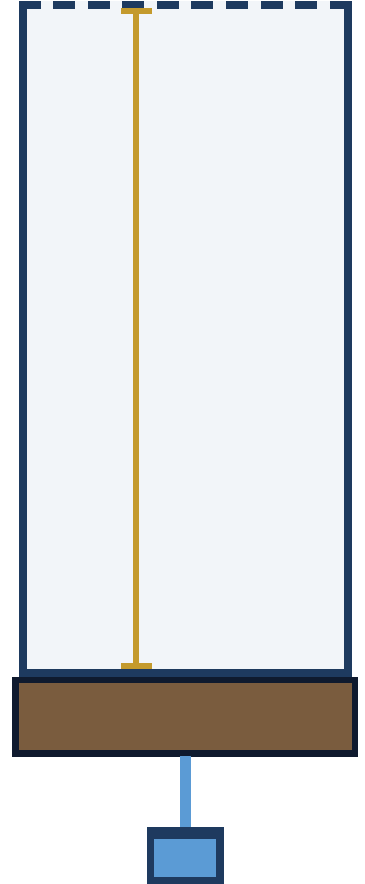
1 • Seal the cage bottom

The soil lives inside the cage. You lose about 6 in (15 cm) of cage height, and the water has nowhere to go.



2 • Drill a drain hole

The water leaves the cage. But where does it go? Now you need a tray or a bucket rig under the cage.



3 • The Crosscutts basin

The soil lives in a basin below the cage floor, and active drainage carries the water to a bucket.

THE CROSSCUTTS BIOACTIVE BASE

Clear Choice: The Basin Is the Difference



This cabinet gives you a real soil floor and active drainage. The enclosure sits on top. The basin holds 4.75 inches (12 cm) of soil, the internal drains carry wastewater to a bucket below, and the cabinet adds 31 inches (79 cm) of height so the top perch sits above your head.



White, Black, or Backdrop?

The Large Hybrid Atrium comes in white and black. White reflects light and gives your chameleon and plants a bright interior. Black looks great and gives you contrast for your chameleon's colors and your plants. A third option is to have a photo backdrop on the back of the cage. Any one of these is a good choice. Pick the one that suits your taste. For the purpose of this demonstration I will be showing you how to do the backdrop because it is the most complicated and makes for a great tutorial — and I have an image I took in Madagascar I would like to use!



White. Bright interior.



Black. Contrast for colors.



Backdrop. Aesthetic appeal.

As I am doing the backdrop it doesn't matter what color the walls are, but it does matter what color the Dragon Ledges are and so, for that reason, I will select black. This allows the Dragon Ledges to fade into the backdrop image. I want to use one of my own Madagascar photographs as a backdrop, and the Dragon Ledges will mount on top of the backdrop. That costs me some interior brightness, but I will compensate with bright LED bar lighting.

A BACKDROP IS FOR US

A backdrop is optional and it is for us, not for the chameleon. Your chameleon knows it cannot climb into the branches in the photograph. So, it isn't a "better husbandry" flex. But it looks nice to us and there is value in that. If you want one, give it time to be printed, cut, and shipped. The backdrop has to be installed on the panels before the enclosure is assembled. That could take a couple of weeks. The attaching for the backdrop is at the end of this chapter.

What I Will Use

ENCLOSURE AND STAND

- 1 Dragon Strand Large Hybrid Atrium, black
- 2 Crosscutts Large Atrium BioActive Cabinet
- 3 Crosscutts Large Atrium Hood

BACKDROP (OPTIONAL)

- 4 Backdrop to size
- 5 Vinyl-to-PVC adhesive. I use 3M Super 90 Multisurface Contact Adhesive.

INTERIOR

- 6 Vertical structural branches, 3/4" to 1" (2–2.5 cm) diameter, cut to about 3' / 90 cm (from park)
- 7 Perching branches in a range of diameters (from park)
- 8 8" (20 cm) black zip ties, heavy duty, in quantity

INTERIOR, CONTINUED

- 9 6" (15 cm) black landscape plant pots in matched pairs
- 10 Various thick branch fragments (9" / 23 cm) for crossbars

SUBSTRATE AND PLANTING

- 11 Organic bottom soil. 64 quarts
- 12 Organic bioactive top soil. I use TerraFirma from The BioDude. 72 quarts.
- 13 Large pebbles for the drain openings
- 14 Leaf litter
- 15 Isopods and springtails, if running bioactive
- 16 Plants: Golden, Cebu Blue, and Satin Pothos for the floor, Monstera deliciosa, Ficus pumila (creeping fig), and a large-leaved climbing Philodendron

BEFORE BUILD DAY

Collect your branches from the park and cut the structural ones to about 3' (90 cm) ahead of time.

Buy your pots in matched pairs. The double-pot method needs two of each size. I use 6" (15cm) diameter landscaping pots. You need to be able to drill holes in them.



The Build

BEFORE YOU START

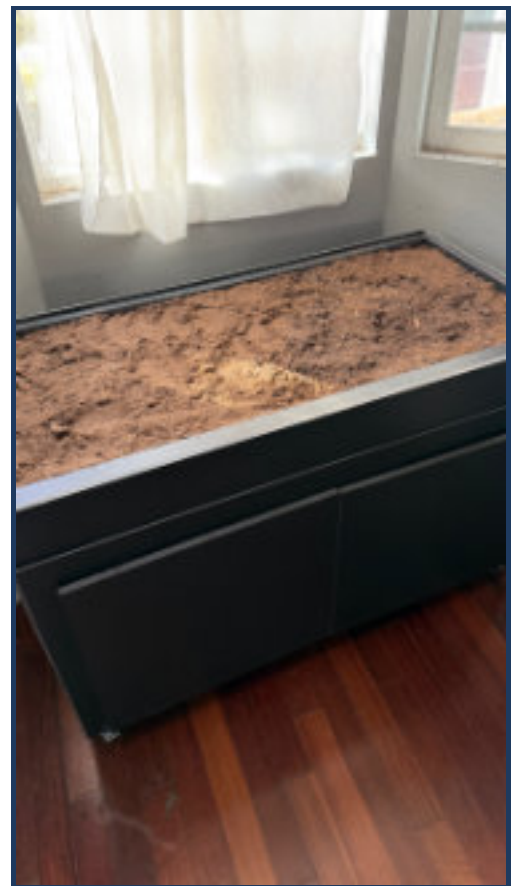
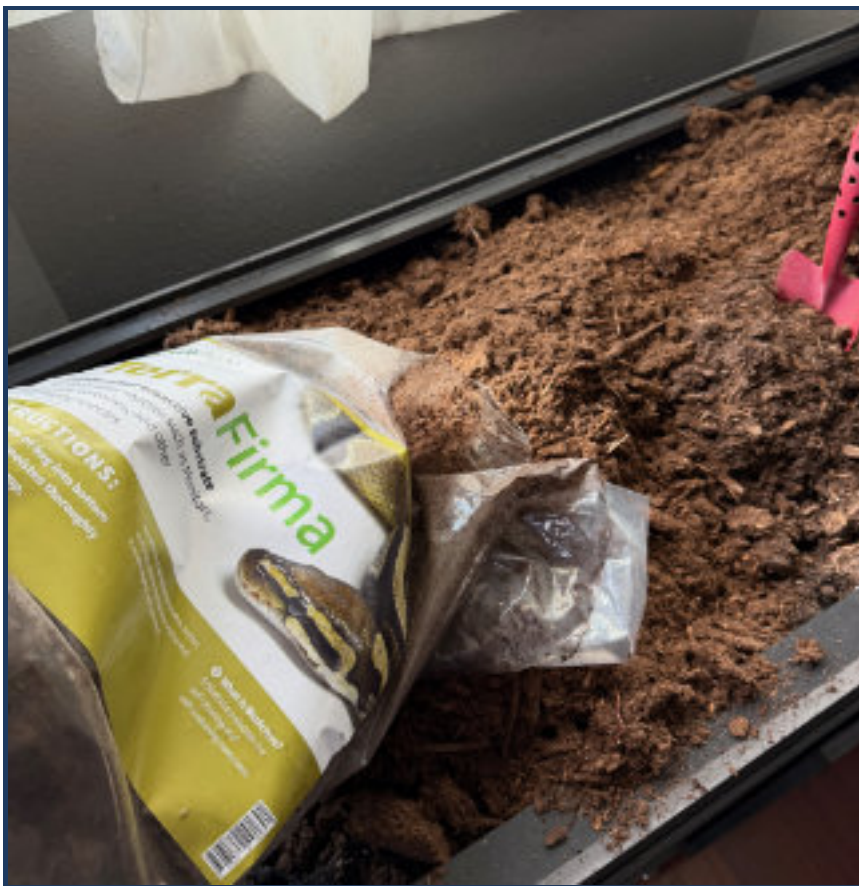
Assemble the Crosscutts cabinet, pull the plugs from the drains, and fill the drain openings with large pebbles so soil cannot pack them. Put the drainage bucket in place now under the drain(s). I will be plugging one drain and using only the other for drainage. Using two drains spreads drainage, but I want to use that side of the cabinet for other storage items. Since you will be wetting the soil from the start, the bucket goes in now.



1

Fill the basin with substrate.

Fill the bioactive basin to the top with organic soil before the enclosure goes on. Dumping soil through a cage door is needlessly tedious and messy, and at about 136 quarts you do not want to do it the hard way. As you put your soil in, wet it so it compacts and you know you are putting in enough soil.



WHY NOW

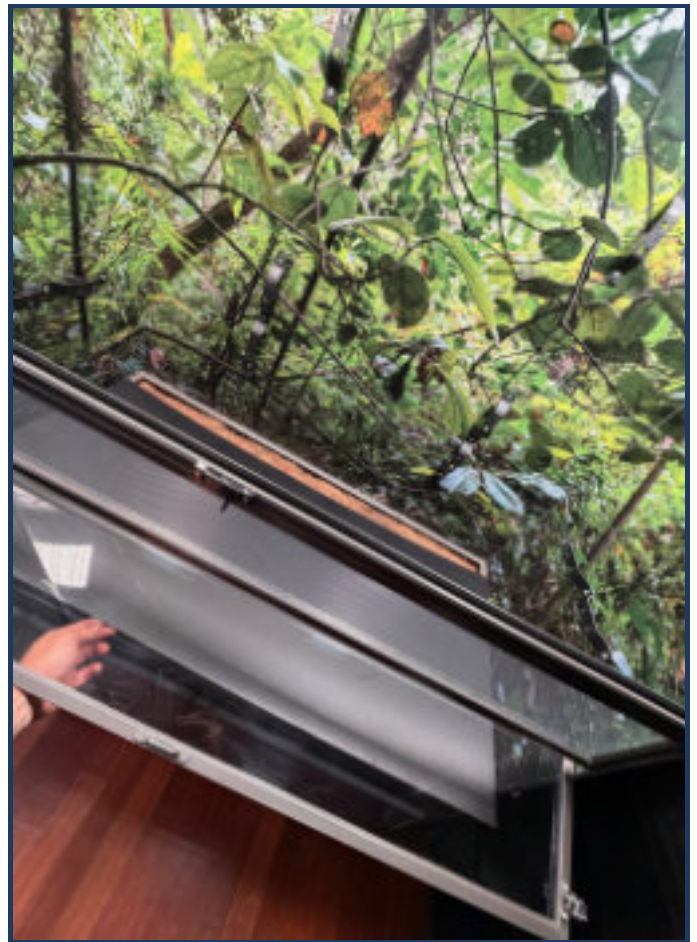
The enclosure is not on yet, so you have the whole top of the basin to work with.

2

Mount the enclosure and drop in the temporary floor.

Set the enclosure on the cabinet and attach it with the screws included with the cabinet. Then slide in the solid floor panel that came with the Atrium over the soil floor.

The solid floor is temporary. It protects the substrate while you build the interior. Zip tie tails, branch offcuts, bark, and whatever else the build produces all need to stay out of the soil. The solid panel catches these things and turns cleanup into sliding one piece out.

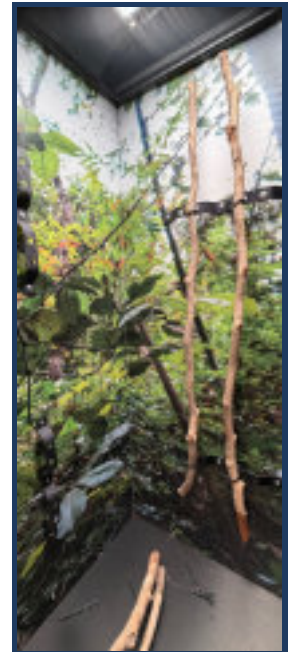
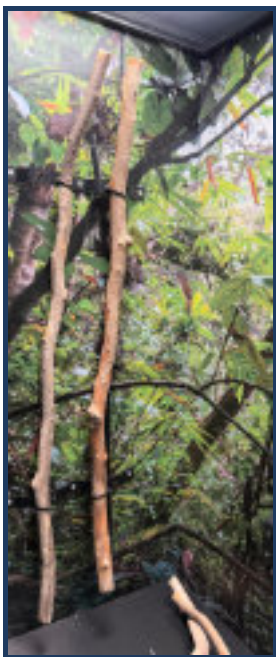


3

Install the vertical structural branches.

These vertical branches are the skeleton. Everything else attaches to them. They form a sort of hashtag pattern with the Dragon Ledges. Vertical structural branches are somewhere around 3' (90 cm) long in my build. They run the length of any place I think I will want to attach a horizontal perching branch. They deliberately do not reach the floor. Anything that ends up at the bottom of the cage, like an escaped cricket, should not have a ladder up to your chameleon.

I run two structural branches per side wall and one for each Dragon Ledge pair on the back wall. Lash each one to the Dragon Ledges with zip ties, pulled tight.



HOW THICK

Use branches 3/4" to 1" (2–2.5 cm) in diameter for structural branches. They need to be strong, but they are not carrying the load: the zip ties transfer it to the Dragon Ledges, and the Ledges to the enclosure walls.

4

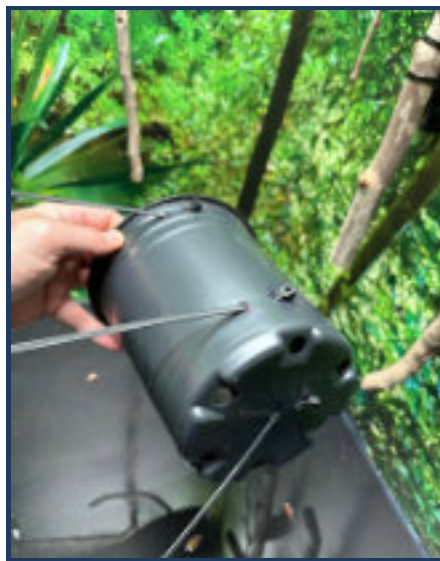
Place and mount the plant pots.

Decide where the plants go before you run any perching branches. Pots are bulky and you do not want to be threading them past finished branchwork.

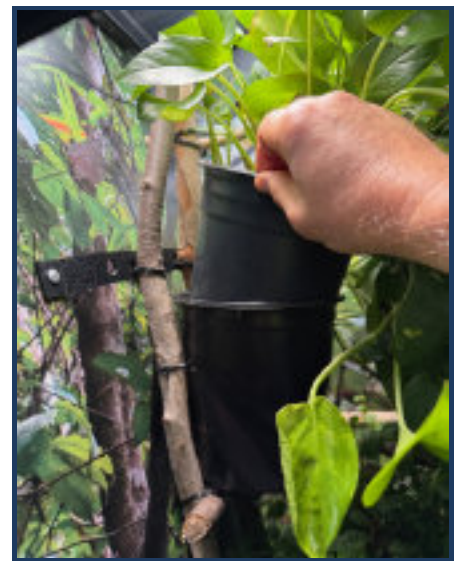
THE DOUBLE-POT METHOD



A. A crossbar completes the three-point connection to support the pot.



B. A series of drilled holes and zip-ties allows the pot to be mounted. Use three anchor points.



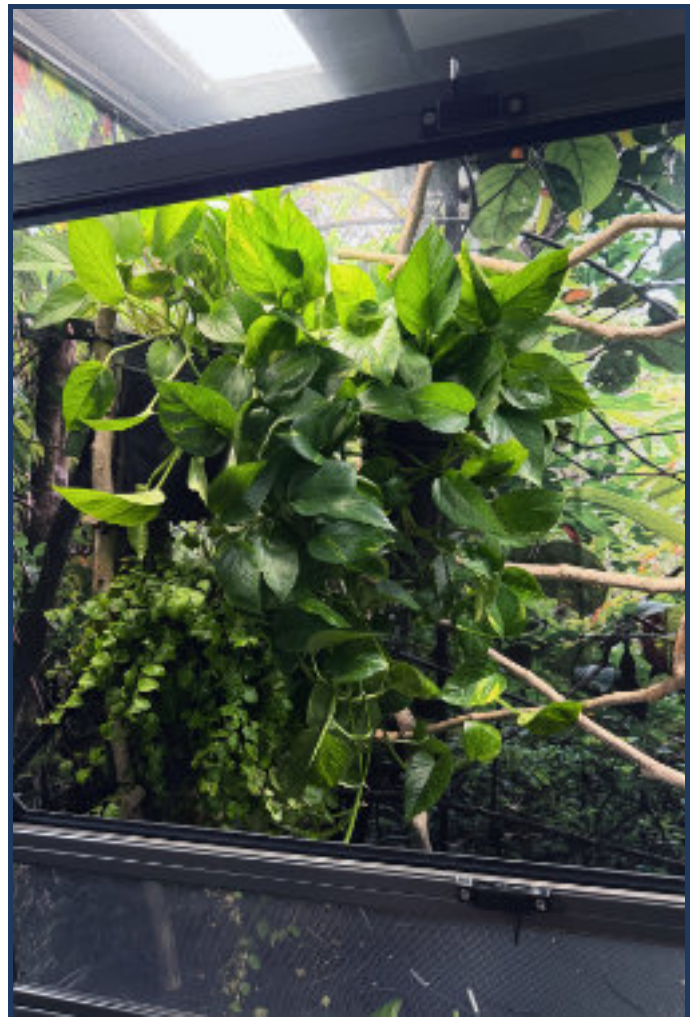
C. Once the mounted pot is in, the planted pot can drop in, and lift out to swap.

Use the double-pot method. Mount an empty pot to the framework by drilling holes and lacing zip-ties through it to attach the pot in three places to the structural supports. Then put your plant in an identical pot that slides into the mounted one. By mounting the empty pot first we reserve the plant's space. Just beware of attaching branches around the empty pot. There needs to be enough space to slide an identical pot that is planted into the empty pot.

When you want the plant in, it drops in. When you want to swap it out, it lifts out and a replacement goes in. You never have to dismantle anything.

I put the pot between the two vertical structural branches. I want to have a connection point on each side. To complete the three-point connection, I support the pot with a crossbar lashed so the pot can rest on it. A double X pattern of zip ties will keep the crossbar from rolling. Attach each mounted pot in three separate places so it cannot swivel.

Placement matters more than variety. The most important plants are the functional ones, and functional means thick foliage toward the front of the enclosure with perching branches behind it. That gives Indigo a visual barrier between himself and the room, and somewhere to go when he wants out of view. Plants on the back wall are for your enjoyment. Both are fine — just place the functional ones first and fill in around them.



5 Branch the interior.

With the vertical structural branches up and the pots mounted, run your perching branches. Vary the height. Build both open perches, where he can bask and be seen, and covered perches tucked behind foliage.

One rule worth holding to: do not run a perching branch directly below another perching branch. Fecal matter needs a clear path to the floor. Stacked perches mean anything that comes off the upper branch lands on the lower one, and that is exactly the cross-contamination route you spent quarantine trying to break.



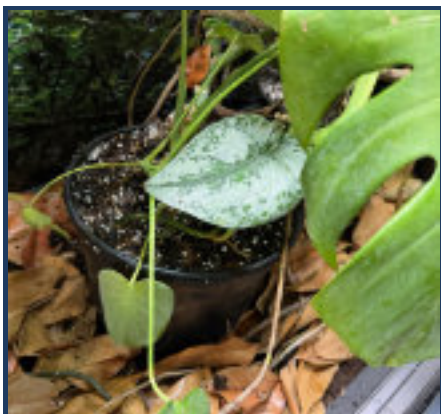
6 Drop in the plants and pull the temporary floor.

Slide the potted plants into their mounted pots. Then pull the solid floor panel, take it out with everything the build dropped on it, and check the substrate for anything that got past.



7 Plant the floor.

Add your ground-level plants directly into the substrate. Put down leaf litter. If you are running bioactive, add your isopods and springtails now. If you have plants that prefer a different soil, like my *Monstera* and *Philodendron*, then use a pot with the preferred soil.





WHAT'S INSTALLED

- 1 Arcadia Jungle Dawn 11.5" (29cm) 15W LED bars (white light)
- 2 Arcadia Jungle Dawn 34" (87 cm) 51W LED bars (white light)
- 3 Exo Terra UVB Pro 200 24W T5
- 4 MistKing misting system
- 5 Fogger input
- 6 Dragon Ledges carrying the floating garden

Note: There is no basking bulb in this set-up

THE ENCLOSURE TOP

White light. I make use of multiple Arcadia Jungle Dawn LED bars. This allows me to maneuver them into the positions where the plants below need the light the most. I use a combination of fixture lengths. In this build I elected to use one 34" (87 cm), 51W fixture along the middle back and two 11.5" (39 cm), 15W fixtures on the sides. I will move them, or even add more, as my plants need more light.

Basking Light. My Parson's ignore any basking light I give them in my conditions, so this build skips it. If your room runs cool, add a weak basking light and let your chameleon decide.

UVB. I am using an Exo Terra 24W T5 UVB fixture. This fixture can hold either the UVB Pro 200 or the UVB Pro 300 bulb. I will use the UVB Pro 200 if the basking branch is closer to the top (which it is), but I can switch to the much more powerful 300 if need be. I also have the option to raise the UVB fixture if I want to fine-tune the UVI hitting the back of the Parson's Chameleon. I specifically have a 24" (61 cm) fixture because I don't need to radiate the entire cage. I will angle it to give the best exposure on the basking branch. There is no basking bulb in this build.

Misters. My misters are positioned so they can create a layer of dew on the leaves that Indigo can easily reach, but also drench the dense pothos foliage on the left where he is likely to be sleeping.

Fogger. I am using a FogFather fogger, which uses a PVC pipe interface, so I will not be using the fogger input that comes with the Large Atrium. I have this positioned so it will blow fog into the pothos, where it will be dispersed.



WHAT'S PLANTED

- 1 Golden Pothos (*Epipremnum aureum*)
- 2 Creeping Fig (*Ficus pumila*)
- 3 Cebu Blue Pothos (*Epipremnum pinnatum*)
- 4 Magnolia Leaf Litter
- 5 Satin Pothos (*Scindapsus pictus*)
- 6 *Monstera deliciosa*
- 7 *Philodendron squamiferum*



THE PLANTS OF THE ENCLOSURE

I have created a “hidden glen” for Indigo to retreat to if he feels the need to hide. I am using two dense Golden Pothos to create this hiding spot for Indigo. I will have to be careful, as the hanging vines will soon reach the soil floor. Once there, they will quickly take over the entire enclosure! So don’t hesitate to trim plants that get out of hand. Below the pothos on the side I have a Creeping Fig. This plant is very sensitive to drying out, so it benefits from the regular misting and fogging sessions. If happy, it will start to climb up the walls and provide an attractive natural feel.

There is a rooted cutting of a Cebu Blue Pothos in the back left corner. This is a slower-growing pothos that I do want to spread across the floor.

Both the *Monstera* and the climbing *Philodendron* need an airier soil, so I have them in their own pots with the right blend of soil. I have a starter sprig of a Satin Pothos in the *Monstera* pot to grow to trail over and hide the pot. The climbing *Philodendron* is a young starter in the back right corner. It can hardly be seen right now, but it will climb up the walls with arrowhead-shaped leaves.

The center plant — the *Monstera deliciosa* — will grow to take a lot of space, but it provides huge leaves that Parson’s like to hide under.

The Finished Enclosure





Backdrops, Start to Finish

A backdrop is completely optional and both the white and black enclosures give a good experience without one. This is here for those who want to go that direction. I am using petbackdrops.com as my example.

Ordering

Two things have to be right: the dimensions and the image.

Dimensions. Measure the exposed interior surfaces, not the panels themselves. Panels overlap where they meet, and since you are running one continuous image across three walls, you want the picture to line up at the seams. If you do not have the enclosure yet, contact the manufacturer and ask for the exposed interior wall dimensions. This only matters where panels meet each other. In my case the top, front, and bottom panels block part of the side and back panels, and I do not care — there is no continuation of the image onto those panels, so it is fine for a strip of picture to disappear behind them. That is much easier than trying to hold a 1/2" (1.3 cm) border everywhere.

MY ORDER FOR THE LARGE HYBRID ATRIUM

Panel 1 left side 22.5" × 48" (57 × 122 cm)	Panel 2 · back 46" × 48" (117 × 122 cm)	Panel 3 right side 22.5" × 48" (57 × 122 cm)	Width × height. Be explicit about which number is width and which is height. The printer cannot see the shape of your enclosure.
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Image. Choose from the company's library or send your own. I am using a photograph I took in Madagascar.



I took this image in the Ranomafana region of Madagascar

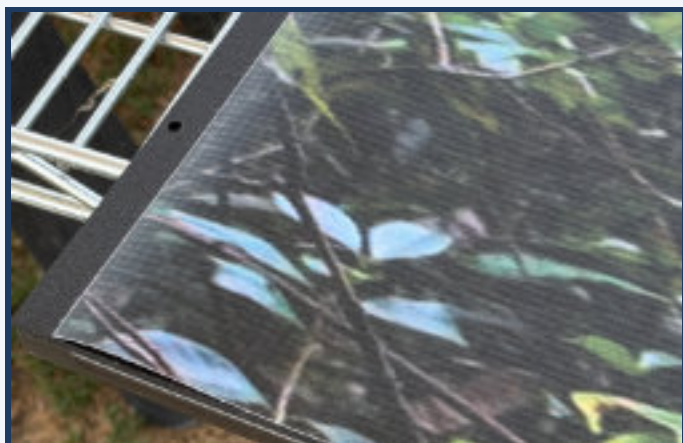
ADHESIVE BACKING OR PLAIN VINYL?

There is an option for having an adhesive attached or plain vinyl. Always plain vinyl, for me. At this size, peeling backing off while trying to place a four-foot (1.2 m) sheet is a fight I will lose. You will see why in the installation steps. I suggest ordering plain vinyl and buy adhesive separately — you need something that bonds vinyl to PVC. I use 3M Super 90 Multisurface Contact Adhesive.

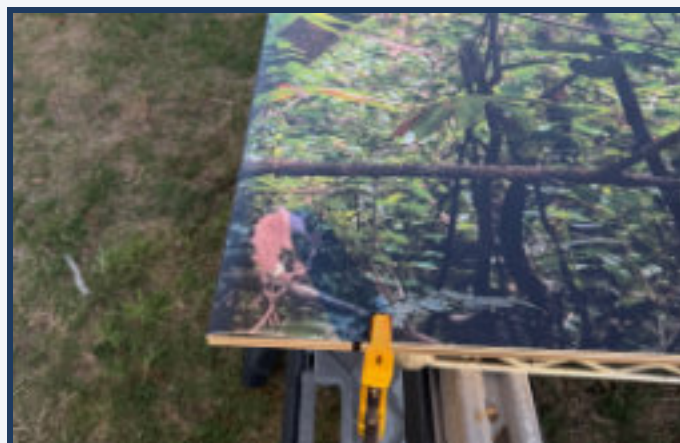


Installing

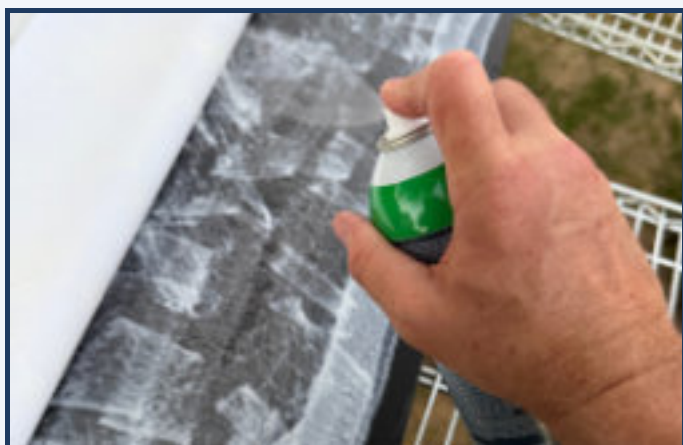
When the backdrop arrives, lay the panels out side by side and check the fit against the print. In my case both side panels have 1/2" (1.3 cm) covered by the back panel, so I am leaving a 1/2" (1.3 cm) gap on that edge.



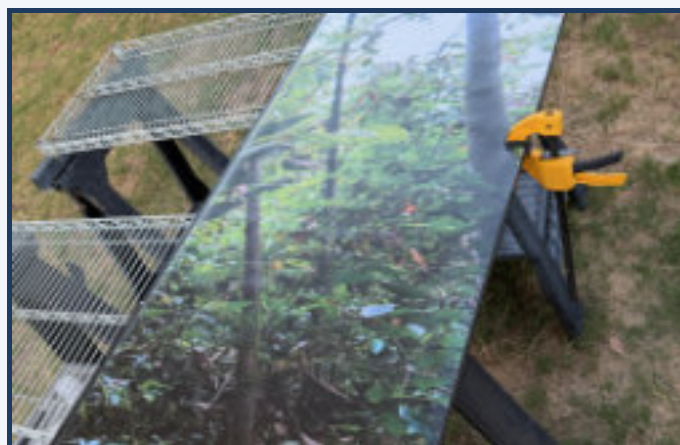
1. Mask off anything you want left exposed. I mark my 1/2" (1.3 cm) gap and lay masking tape over it as a visual guide. Once the backdrop goes down there is very little room to adjust.



2. Position the backdrop on the panel and clamp it. You only need it held well enough to glue one edge.



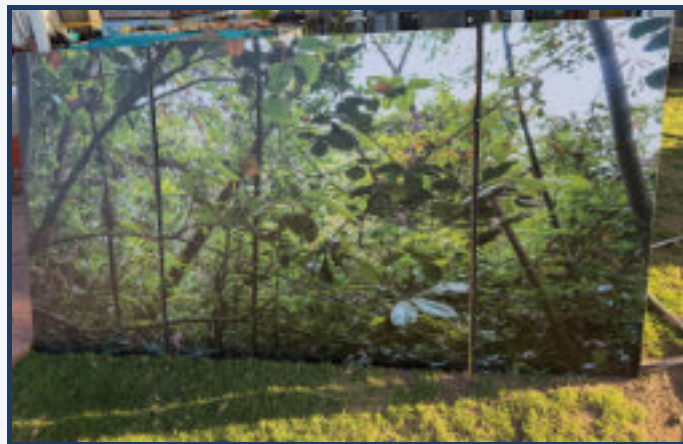
3. Lift one end and spray a one-inch (2.5 cm) strip of adhesive on both the PVC and the vinyl. Set that edge down, check it is flush and square, and smooth it out.



4. Let that edge dry completely. With one edge permanently fixed in the correct position, the rest of the job is easy.



5. Apply adhesive the rest of the way and lay the backdrop down, working out from the fixed edge. Rub out bubbles and creases as you go.



6. Repeat for the other panels.



7. Once everything is dry, assemble the enclosure. You will have to poke starter holes through the backdrop from the back to install the Dragon Ledges. As painful as it is to punch a hole in a brand-new backdrop, this is part of the process and every hole ends up completely covered by the Ledges.

START WITH A THIN STRIP ON PURPOSE

It lets you tack the backdrop in the right position without any other part of it touching. The biggest mistake is coating the entire panel and trying to place the whole sheet at once — it will grab before you have it straight, and then you own it as is.



Chapter 13

Plants for the Enclosure

Plants do three jobs in a Parson's enclosure.

They provide visual cover. A Parson's that can get out of sight when it wants to is a calmer animal, and dense foliage is how that happens.

They provide drinking surfaces. Mist collects on the leaves as drinkable water. A sparsely planted enclosure dries out almost as soon as the misters shut off. A well-planted one holds water on foliage and gives the animal a longer window to use it.

They add humidity. Live plants transpire, and, in a hybrid enclosure, even that minor humidity can create a microclimate.

Choose the Plant for Foliage, Then Build the Perch

It is difficult to find a plant that does everything at once. You want dense foliage, branches strong enough to hold a Parson's Chameleon, and a size that fits an indoor enclosure. If you find a plant that gives you all three, use it.

But there is an easier and more reliable way. Choose plants purely for the foliage they give you, and then run branches so the chameleon can use that foliage.

I have a large-leaved *Monstera* planted in the floor of one of my Parson's enclosures with branches running underneath the leaves. My female moves herself so her body sits protected under a leaf. She is not on the plant. She is on a branch I placed to take advantage of the plant.

Once you separate the perching job from the foliage job, your options expand enormously. You are no longer limited to the short list of plants strong enough to hold a 750 gram animal.

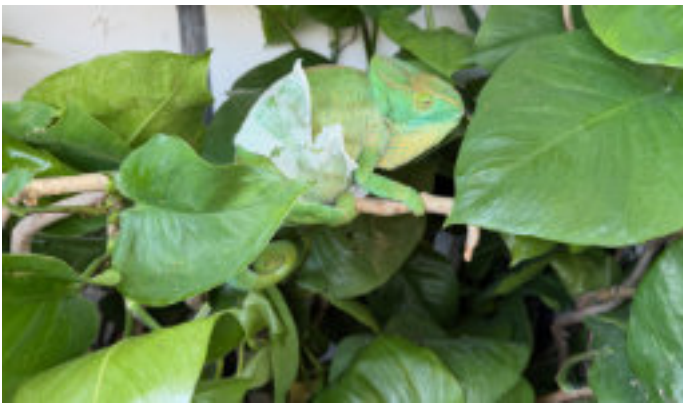
Where Plants Go

Functional plants are the ones working for the chameleon. To provide visual cover, they should be towards the front of the enclosure and be dense enough that your chameleon can perch behind them and be concealed from the room. Vining plants mounted to the wall are ideal for this because they trail down and create a curtain of foliage. It is surprising how such a large chameleon can tuck itself into that and be difficult to find.

Decorative plants on the back wall add visual interest for you. That is a legitimate reason to put a plant in an enclosure. This is your animal in your room and you should enjoy looking at it. Just get the functional placement done first, and then fill in with flowering plants, orchids, carnivorous plants, or whatever else in the plant world catches your interest.

Plant Recommendations

Pothos in its several varieties is a common and effective backbone plant for thick foliage and wall mounting. *Philodendron* and similar vining plants do the same job. For the floor, *Alocasia*, *Monstera*, and the large *Philodendron* varieties give you the leaf size you want.



Pothos (*Epipremnum aureum*)
WALL · A CURTAIN OF FOLIAGE



Philodendron (vining)
WALL · VINING COVER



Monstera
FLOOR · LARGE LEAVES



Money Tree (*Pachira aquatica*)
FLOOR · LARGE LEAVES



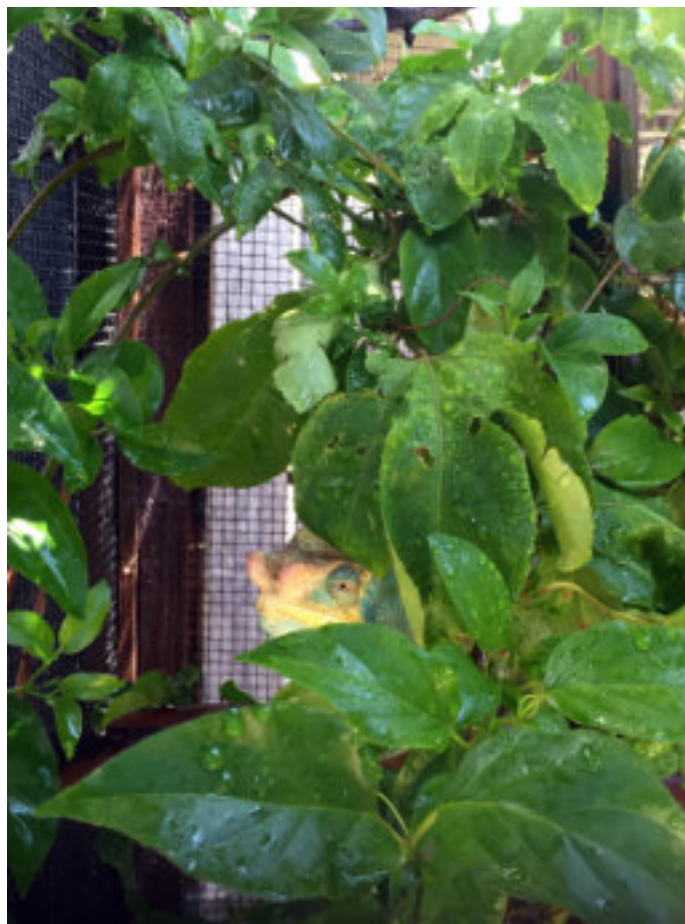
Bird's Nest Fern

FLOOR · LARGE LEAVES



Nepenthes

DECORATIVE · PITCHER PLANT



Toxicity

I am not aware of any documented poisoning of a Parson's Chameleon by an enclosure plant. Several popular enclosure plants contain irritant crystals (oxalates), though Parson's are not leaf eaters. Lack of evidence does not prove anything, but it does give you an indication that the risk is very low.

Pesticides

Most plants from commercial greenhouses are grown with systemic pesticides. Systemic means the compound is inside the plant tissue rather than sitting on the leaf surface, so washing leaves does not remove it. A rinse to knock off dust is still worth doing, but do not think of it as decontamination.

The good news is that this has not been a problem in practice. Veiled Chameleons are the species famous for eating plants. They get kept on standard nursery plants across the entire hobby, and they are not getting sick from it. That is the evidence we have. If someone eventually does the deeper study, we will all read it with interest.

Plants to Avoid

This is mostly common sense, but we should list it.

Do not put in plants with contact poisons. Poison ivy, poison oak, and stinging nettle should not be used. Avoid plants with thorns or sawtooth leaf edges. Some bromeliads and bougainvillea fall here. Chameleons navigate thorns in the wild, and some chameleon species actually live in thorn bushes for the protection they offer, but inside an enclosure the space is small enough that thorns become a movement restriction rather than a security feature.

Carnivorous plants are a fun addition and for the most part pose no danger to an animal the size of a Parson's. Use your judgment about size. There are traps out there large enough to take a hatchling. If you want to try *Nepenthes* tropical pitcher plants, these varieties do well in Parson's conditions: *Nepenthes alata*, *Nepenthes* 'Miranda', and *Nepenthes* × *ventrata*.

Keeping Plants Alive

It can be frustrating how hard it is to keep plants alive in a chameleon enclosure. Even something as supposedly indestructible as a Pothos can be a challenge. But there are really only four main ways plants die in our care and if you cover these you will solve most of your problems.

Too little water. This is the most common reason plants die in our enclosures. They dry out. Check the soil and see whether it stays moist or whether it has turned into a solid block of peat which repels water.

The mistake behind it is assuming the misters are watering the plants. You might be surprised how little of the mist actually reaches the soil. When we choose plants for foliage density we end up with plants whose own leaves block water from getting to the root ball. You can be hauling buckets of drainage water out of your enclosure every week and still have a plant dying of dehydration, because the water hit the leaves and rolled off to the floor.

The solution is to water your plants by hand every weekend if the soil dries out. I use an old-fashioned watering can, or a quarter-inch (6 mm) drip system when I want it automated.

Too much water. If a mist head is pointed straight at the soil of a plant, that plant may be getting too much. Our typical indoor plants like to dry out between waterings and constantly saturated soil rots roots. Something has to move. Either relocate the plant or aim the mist head somewhere else. The mister should be pointed at the leaves.

Too little light. If your plants are growing stringy and reaching, they are underlit. Light is a plant's food. Chameleon keepers have a chronic history of underlighting our enclosures, and it gets worse with a large Parson's enclosure because there is so much more volume to fill. The good news is that current LED technology gives us brighter light in smaller fixtures. The solution is simply more light or more powerful light. Just watch that you are not picking up so much waste heat off the fixtures that you drive the ambient temperature up.

Too much light. There is such a thing, but with the equipment we use it is rarely the actual problem. What looks like too much light can really be too much proximity to the heat lamp, and the plant is being desiccated rather than overexposed. Move the plant away from the basking lamp. Though, since Parson's Chameleon keepers rarely use heat lamps, this is rare.

FOUR WAYS PLANTS DIE

Two Parameters, Both Ends

	TOO LITTLE	TOO MUCH
Water	Dries out The soil turns to a dry block. The misters are not reaching it. Hand-water weekly.	Root rot A mist head is aimed at the soil. Aim the mister at the leaves.
Light	Stringy growth The plant is reaching for light. Add more, or brighter, light.	Desiccation Usually heat from the basking lamp, not light. Move it away from the lamp.

Notice how these four break down. Two parameters, water and light, and both ends of each one. This is how you can evaluate every husbandry parameter. Look at both extremes and understand what happens at each end. Sometimes both ends are dangerous. Sometimes one end is harmless and knowing that is just as valuable, because it tells you where you do not have to spend your attention.





Chapter 14

Branches for the Enclosure

Branches create the shape of your chameleon's territory. They determine how your Parson's Chameleon moves through the space, where it feels secure, and whether it can reach everything it needs without an uncomfortable stretch. The plants give cover and the lights and misters give resources, but the branches are what connect all of it.

Chameleons Are Horizontal Animals

When people hear that chameleons live in trees they picture up and down movement, but chameleons actually prefer to move back and forth. They just want to do it high up where they feel safe!

So your branch network has to prioritize horizontal pathways. You need branches running left to right across the enclosure at multiple heights, not a set of climbing routes.

This is also why the enclosure has to give you anchor points on the walls. In a screen cage you can attach at the aluminum frame and nowhere else, which means every horizontal branch has to span corner to corner and your network is limited to whatever that geometry allows. Wall anchors, like Dragon Ledges, solve the problem. You can put a vertical anywhere along a wall and hang horizontals off it at any height and any depth into the enclosure. That is what makes a real network possible. Whatever enclosure you build in needs to do that job somehow.

Three Kinds of Branches

I divide branches into three categories. Each does a different job.

Structural branches are the framework. These are the verticals you lash to the wall anchors, 3/4 inch to 1 inch (2–2.5 cm) in diameter, and their job is to give you attachment points at any height. Your chameleon probably will never spend time on them, but they will anchor the branches your chameleon uses.

Perching branches are where your chameleon actually spends its life. Basking, sleeping, resting, watching the room. A perching branch should be thick enough that the toes don't overlap when your chameleon wraps a foot around it, and thin enough that the foot reaches at least halfway around. Don't worry about how small they seem. You would be surprised at how thin the branches are that

Parson's Chameleons like to perch on!

The Basking, Surveying, and Sleeping perches should be selected to be "perching branch" diameter for comfort.

The basking perch. A horizontal branch positioned under the basking lamp (if you use one) and the UVB where your chameleon can warm up in the morning and get its UVB exposure. This does not have to be a single branch or a single location.

The survey perch. Perching up near the top of the enclosure, above the plant layer, where your Parson's can sit and look down on you and the rest of his human servants. Height is security for this species, and an animal that can get above your eye level is a calmer animal. Keep at least part of the survey branch outside the UVB, so your chameleon can watch the room without having to sit under the bulb.

The sleeping perch. A branch usually toward the back or a side and obscured by foliage, where your chameleon can sleep or get out of view during the day.

Add more wherever you think your chameleon might want to be. Near the feeding station, down in the cooler shaded zone, out where the misting lands. Basking, surveying, and sleeping are the minimum. The more options you offer the better life your Parson's will live.

Network branches fill in everything else and create the pathways between the perches. These can vary in diameter and they can crisscross, angle, or run parallel. You are not building a specific pattern. You are making sure your chameleon can get from any point to any other point without climbing down to the floor and starting over.

The more network branches you have, the more options your chameleon has. Keep the body size of an adult Parson's in mind, though. Make sure the network is not so dense that an adult Parson's cannot easily navigate through it.

What Branches to Use

I recommend using natural branches that vary in diameter along their length. The irregular surface gives the feet different work to do at different points, and that variation is good for foot health.

I do not use dowels or bamboo. They are uniform and smooth. Every perch feels identical, so the feet grip the same way all day long. Soft dowels can also soak up water and are slow to dry, which is the last thing you want in an enclosure running the water volume a Parson's needs.

My personal favorite is natural sycamore branches. I like the texture and the shapes it gives me and it has held up well in my enclosures. But that is just my preference. Oak, maple, and most hardwoods all work. I do avoid pine because of the sap. There is no formal list of branch species ratings. You'll have to use your best judgment in the moment. Rest assured that there is no deep secret. You want branches that are strong and free of sap or anything else you don't want your Parson's standing in.

You will find branches in your backyard, in local parks, from tree trimming services, or on the ground after a storm.

Sanitizing

The community has a range of opinions on sanitizing branches. Options range from baking branches in the oven to soaking them in a bleach solution to doing nothing at all. I spray mine down with water and let them dry, and that is the extent of it. I have used this method successfully for decades without issue.

If you want to take it further, take it further. There is no harm in baking or disinfecting branches. And if it lets you put a branch from the park into your chameleon's enclosure without worrying about it, do it. Do what you need to do to be confident you have done the best you can for your chameleon.

Branches Do Not Last Forever

You are putting dead wood into a wet enclosure. It will eventually break down and have to be replaced. This is just part of what we do!

Check your branches when you are in the enclosure doing anything else. Press on them. A branch that has gone soft or spongy is on its way out. Pay particular attention where a branch is lashed to a vertical, because that is the last place to dry, and it is where a failure is hardest to see coming.

When one starts breaking down noticeably, pull it and put in a new one. This is

routine maintenance, not a problem, and it is one of the advantages of building with zip ties. Nothing in the enclosure is permanent and nothing is difficult to swap. Just remember to avoid blocking the ability to pull a plant out unless you are accepting that you will have to disconnect the branch anytime you want to move the plant. This is a minor inconvenience as pulling plants out is a rare occurrence — so don't stress on this decision!

Test It from the Chameleon's Side

When the branches are in, mentally put yourself in the enclosure and start in the middle.

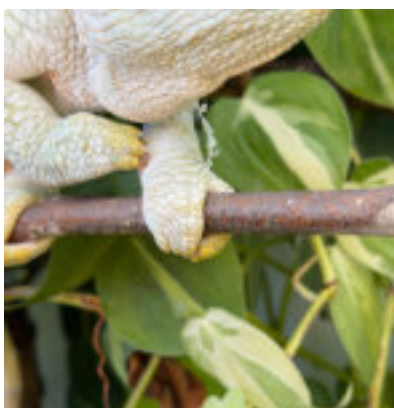
Can you get to the basking branch? Can you reach the survey perch up top? Can you get to the sleeping spot? Can you move between the different microclimates without backtracking or dropping to the floor?

Where you find a gap or an awkward stretch, add a branch. Remember that plants are going in too, and trailing foliage is going to obscure some of what looks open right now. Build the network with that in mind.

SIZING A PERCHING BRANCH



This would be an ideal perching branch. Notice how the chameleon can get a comfortable grip around the branch.



This branch would be too thin for a perching branch for Blue. Notice how his toes overlap on the underside of the branch.

Now, let's keep all this in perspective. Chameleons will crawl and perch on a wide variety of branch diameters. This formula for a "perfect" perching branch is simply to provide you a target diameter to look for.



A TOUR OF PARSON'S ENCLOSURE BRANCHES

1 STRUCTURAL BRANCHES — These thick branches fade into the background, but provide the anchor for pots and horizontal branches.

2 BASKING PERCH — There is no heat lamp in this setup, but there is UVB. The UVB fixture has been moved so the UVI 3 falls upon Indigo when he is on this part of the branch.

3 SURVEYING PERCH — This is the same branch as the basking perch, but, without the UVB it allows Indigo to see the world without UVB exposure. Branch (and perch) designations are a function, not a specific branch. A single branch can have multiple functions and you can have multiple branches serving the same functions!

4 SLEEPING PERCH — The sleeping perch is difficult to see clearly because it goes behind the pothos and provides a place for Indigo to feel safe sleeping.

5 NETWORK BRANCHES — Various diameters. These are just highways to different corners of the enclosure.



III

Part Three

The Parson's Chameleon Environment

Temperature, humidity, light, air, and water are the conditions your Parson's lives in every day. This part explains each one, the numbers to aim for and why, and how they come together in a daily and yearly rhythm.

IN THIS PART

Every number in this part is a starting point, not a rule. The parameters are connected: change one and the others move with it. Read with your own climate in mind, because a dry home, a humid home, and a seasonal home each need a different balance. The first chapters set the year-round baseline; the last adds the seasonal cycle.

PART GLOSSARY

Edema

Fluid building up in the tissue, usually a swelling around the neck. In Parson's it appears alongside supplement powders often enough that keepers treat the two as linked.

Fogger

A device that turns water into a fog fine enough to hang in the air. The core of nighttime hydration.

Heat Stress

Overheating. Signs come in order of severity: color washing out and dropping low, then gaping, then eyes closing.

Naturalistic Hydration Schedule

Nighttime fogging, a short mist at the start and end of the night, and an adjustable afternoon rain shower.

Tolerance Zone

The range of conditions a chameleon can survive for a time, as opposed to the conditions that are best for it.

UV Index (UVI)

A standard scale of ultraviolet intensity and the working measure for UVB. The book targets UVI 3 at the basking branch.



Chapter 15

Environmental Conditions

Environmental conditions are surprisingly difficult to nail down for a care guide. Every parameter is connected to every other one, which means there are many combinations that work, though some will work better than others. Experienced keepers often do not think about the interactions at all. They look at the chameleon, feel the room, and know what needs to be done. That is a practiced skill and it takes years to build.

So what do you do before you have the “feel”? You start with the numbers in this chapter. These are not the only conditions a Parson’s will accept. They are the combination that gives you the widest buffer across the widest range of household situations, which is exactly what you want while you are learning.

This is going to put you in conflict with things you hear in the community. One keeper will describe his Parson’s outdoors on a 106°F (41°C) day. Another will describe running a dehumidifier in the room to get the enclosures to dry out. Both are true accounts from people who know what they are doing, and neither one contradicts what is written here. There is a wide range of conditions a Parson’s can handle for various lengths of time, and the ranges shift depending on what else is going on. Higher humidity produces a greater tolerance for higher temperature, for example. But sharing the temperature without the corresponding required humidity could be disastrous. Every extreme condition has a context in which it is survivable and a context in which it is not. What the experienced keeper has is the ability to read the whole context at once. Until you have that, these numbers keep you safe.

Learning your Parson’s tolerance zone is not the best use of your time right now. Stay safe, and let the edge cases you hear about be things you learn from while you build your skill at reading your chameleon and the situation. As you gain experience you will develop a feel for what can shift in your particular climate with your particular animal.

These numbers are the starting point, but the real goal of husbandry is becoming attuned enough to your chameleon’s behavior that you adjust to what it is telling you.

A Note on Locales

Parson's Chameleons come from different forests at different elevations, and you would reasonably expect the ideal conditions to differ from one locale to another. In practice we have not found that to be necessary. Keepers across all the locales are succeeding on essentially the same numbers. I would welcome more observation and experimentation on this in the future, but at this point there is nothing to suggest you need different conditions for a higher-elevation Yellow-lipped than for a lower-elevation Orange-eyed.

Temperature

Parson's Chameleons are comfortable at typical household temperatures. If your house runs in the mid- to upper 70s°F (23–26°C), they are in their range. Many keepers maintain Parson's successfully with no supplemental heat beyond the minor waste heat that comes off their white lighting.

The high 70s°F (25–26°C) is the sweet spot. It is warm enough that they eat readily and cool enough that they show no signs of heat stress. As a general rule, avoid the mid-80s°F (29–30°C) and above. That is for indoor keeping. Outdoors, the mid- to upper 80s°F (29–32°C) are fine in a large enclosure with plenty of microclimates. Wind, breezes, and constantly shifting conditions make the outdoors far more dynamic than a room.

Heat stress does not happen at one black-and-white temperature. In the right conditions, with dense foliage and good hydration, a Parson's will be fine at higher temperatures than those listed here. But the further you take your chameleon into its tolerance zone, the more skill is required to know when you have gone too far. So stay close to the ideal.

Heat is more deadly than cold for chameleons. I am not recommending this for casual husbandry, but a fully acclimated Parson's Chameleon can handle a nighttime low into the low 40s°F (4–6°C). But handling a condition is very different from it being good husbandry. The point is that you should target the low 60s°F (16–17°C) as your nighttime low and not panic if it dips below that. What matters more is whether your chameleon is able to warm up to a functional temperature during waking hours. If you plug into the community and hear about keepers running Parson's outdoors through very cold nights, notice that those

same areas have clear sunny days. Everything is connected.

These are your year-round baseline numbers to get you started with your setup. There is an annual cycle layered on top of them, including a cooler brumation period.

Humidity

The targets are 50% humidity during the day and 90–100% at night. They stay the same through brumation.

The daytime target is a hygiene compromise, not a chameleon preference. Parson's Chameleons would be perfectly happy at high humidity around the clock. In the Madagascar wet season, humidity is high during the day and higher at night.

The reason we bring our humidity down in captivity is that sustained high humidity in an enclosed space with limited airflow creates conditions where bacteria, mold, and fungus thrive. Letting branch and leaf surfaces dry out during the day is what keeps the enclosure hygienic.

In Madagascar, even at high humidity, it is not stuffy. Surfaces dry and the chameleons keep moving. The issue with captivity is that we have to cut the ventilation to raise the humidity. We trap humid air in a box. The more we do that, the longer surfaces stay wet. And our chameleon is more affected by this because it leads a more sedentary life in captivity. Their feet do not move on the branches as much. But we need the humidity for proper hydration. Thus the balance we strike.

So read the 50% figure as a consequence of our airflow rather than as an independent target. A keeper with air movement through the enclosure can run higher daytime humidity safely. A keeper with a stagnant box cannot safely run even 50%. Our goal is to maintain what humidity we can while surfaces are allowed to dry.

Your climate determines which direction you will be fighting. In the dry Southwest US, keepers struggle to hold humidity at all — everything dries within minutes of the mister shutting off. In the hot and humid Southeast US, evaporation cannot be counted on and you might have to bring in a dehumidifier just to get their

enclosure to dry out. Same species, same targets, opposite problems.

This is worth keeping in mind whenever you take advice. Where is the person who is giving it, and how close are their conditions to yours? For this book I have specifically gathered information from keepers across different climates so the explanations hold up wherever you are.

Baseline Numbers

Daytime temperature	High 70s°F (25–26°C)
Avoid indoors	Mid-80s°F (29–30°C) and above
Nighttime low	Low 60s°F (16–17°C)
Daytime humidity	50%
Nighttime humidity	90–100%





Chapter 16

White Light

White light is one of those parameters we usually don't think about, but it sets the stage for the chameleon's entire day!

White light does two jobs. It lights the chameleon's world, and it feeds the plants.

Lighting the Chameleon's World

Chameleons use sight as their main sense. Both the amount of light and the quality of it matter for the animal to understand and interact with the world around it.

So be deliberate about creating a bright interior. Do not be shy about adding more light bars to the top.

You also want that bright area to be up top. That is where a Parson's is used to finding it, and it is part of what makes the upper canopy read as the right place to be.

Feeding the Plants

Beyond the twelve-hour photoperiod for your chameleon, this light is what the plants are eating. The brighter the light, the more they have to eat.

Plants mounted on the sides, up near the lights, are easy. Plants sitting on the floor of a four-foot-tall (1.2 m) enclosure are often starved. Most of the time those plants will not be healthy, and the reason is simply that they are not getting enough light to "eat."

If your floor plants go stringy and die, you do not have a plant problem — you have a lighting problem.

Choosing a Fixture

There are two main options for lighting your Parson's Chameleon. You can piece together lighting from various sources or just purchase reptile lighting.

Home Improvement Store

You can shop for fixtures and full-spectrum lighting from the home improvement store. Look for 5000K to 6500K full-spectrum lighting. Fluorescents, which used to be the standard, are being phased out and we have largely moved to LED bars.

Home improvement stores now sell LEDs shaped like fluorescent tubes as drop-in replacements.

Reptile-Specific Lighting

A number of companies produce LED bars specific for reptile keeping. Arcadia, Exo Terra, and Thrive Eco-Systems all make bars intended for reptile enclosures.

Now, I can tell you what to avoid. Don't go to Amazon looking for the cheapest option. You will come back with plant grow lights that give off an eerie purple tinge. You want white light. You do not want colored light. Your chameleon has to see in this environment!

One personal preference, offered as preference and not as a requirement: I like the LEDs close enough together that I do not see individual points of light. I want it to look like a coherent light source.

Photoperiod

The standard photoperiod we use in captivity is twelve hours on and twelve hours off, year-round.

The Other Twelve Hours

The 12 hours off mean more than just lights out. They mean dark.

The target is as dark as you can get it. Quality of sleep is directly related to how dark the area is. With lights on in the room, or a television going, a chameleon will still sleep — it will tuck itself into the leaves to get away from the light — but it will be sleeping lightly, and a small disturbance will wake it. We want the deepest sleep possible, so we go for the darkest room possible.

Do not use night bulbs. No red bulbs, no blue bulbs, none of that. Those products exist so that you can watch your animal at night, and there is nothing your animal gains from them. And, chameleons see them very well.

This also includes light you did not choose. If your enclosures are outdoors, porch lights and street lights count. Any light coming into that space is going to disrupt sleep, and the fact that it is not coming from a fixture you installed does not change what it does to your chameleon.

You can absolutely check on your chameleon at night. Just understand what you are doing when you do it. Any light you bring in will disturb them, and a flashlight on a sleeping chameleon will wake it up. Look quickly and let them go back to sleep.

Someone is going to point out that a Parson's in Madagascar gets a full moon, and that is true — it is not always completely dark out there. But Madagascar is not always ideal either. That is exactly why these animals have a tolerance zone in the first place. Our husbandry is meant to point to the ideal!

Waste Heat

Fluorescents and LEDs are low waste heat, but they are not no waste heat, and heat does come off the fixture.

Usually that works in your favor. With efficient LEDs the waste heat is often enough to bring a Parson's enclosure to the temperature it should be, and you may not need a basking bulb at all.

A Parson's enclosure is big enough to absorb that heat in a way a nursery cage is not, so this rarely becomes a problem. The exception is a solid-sided enclosure, where warm air has nowhere to escape and heat will build. That is why hybrid owners may need to shut the basking light off after a couple of hours. All-glass enclosures are the extreme case, but they are rare with this species, because glass at the size a Parson's needs is amazingly expensive, incredibly heavy, and hard to find at all.

Mounting

Mount the light fixture above the enclosure or set it directly on the screen top, whichever suits your setup. Unlike UVB and basking, the exact distance is not something you need to worry about. There is no measurement to hit and no burn risk to design around.

Shade

Shade is critical. A Parson's needs to be able to get out of the light, and heavy foliage is what gives them that. They will sneak into the foliage and hide when they want to. Your job is to make sure that option exists.



Chapter 17

Heat & Basking

Many people say Parson's Chameleons do not need a heat lamp, and practically speaking that is often true.

But let's look at what is actually going on. All chameleons need to be able to warm up to a level where they can function. We give them cold nights on purpose — into the low 60s°F (16–17°C), sometimes lower — and they sleep great. They cannot stay at that temperature during the day. They have to warm up from it somehow.

So when we say a Parson's does not need a basking light, what we are really saying is that warming up to room temperature is enough.

Although they will bask. We see them doing it in Madagascar and we see them doing it in captivity.

Given that, I take the safer approach. Rather than telling you a Parson's does not need basking, I would tell you to provide a weak basking light in the corner and let the animal decide. If they never use it, that is your signal that they do not need it in your environment and you can take it away. If they do use it, then that is your clue that your environment will benefit from an extra heat spot. This is the safest way to do it because your situation is unique and if you have a home (or basement) that is on the cold side, your Parson's may need a basking light even though mine ignore any basking light I give them. At the very least you need to be aware that it is a possibility and be able to make that call. If you are not sure, give them a couple of hours of basking opportunity in the morning and let them be the expert to tell you whether they need it or not.

Setting It Up

I typically use a low-wattage incandescent or halogen bulb in a fixture. 60 to 75 watts is my starting point.

Put it in a corner of the enclosure and set it up by feel. Put the back of your hand under the lamp where the animal would be. It should be comfortable. Not hot — comfortable.

I use the back of the hand rather than a temperature probe deliberately. A probe reading is not really defined — what exactly are you measuring, and where? The back of your hand is feeling what the chameleon is going to feel, and you will know

immediately whether it is comfortable or not.

I acknowledge that this makes people nervous because there is no number to hold onto. It is a judgment call. But I find it more accurate than any other way of communicating how to set up a heat lamp.

Then check the top. Reach inside the enclosure and put the back of your hand up against the top screen directly under the bulb. If it is burning your hand, raise the lamp an inch (2.5 cm) and try again.

That check matters less with adult Parson's Chameleons than with most species, because adults rarely crawl on the top screen. They stay on their branches. Juveniles can and do climb the screen. And adults do explore, and sometimes they will work their way toward the top of the enclosure, so make sure there is no dangerous heat waiting for them when they get there.

Signs You Have Gone Too Far

Gaping is your sign that you have gone too far. It is a heat stress signal, and hopefully you never see it. If you do, something needs to change now. Before it gets that far, watch for the earlier signs: your chameleon's color washing out and the animal dropping low in the enclosure to get away from the heat.

Life Stage and Sex

Juveniles, adult males, females, and gravid females all respond differently to the same conditions. This is why we like to construct an enclosure with gradients and microclimates. The more we provide, the more they can choose and the less we have to "know" what they need.

Night Heat

It is exceedingly rare that there is a situation where the Parson's Chameleon is living in the same space as you and would need night heat. But if they are in a basement or garage you may have to consider the night temperatures.

If your Parson's can warm up during the day, it handles cold nights without difficulty. Mine go into the high 40s°F (8–9°C) during brumation here in Southern California with no problem at all.

Take that as an example rather than a target. Those nights are coupled with clear

sunny days. This is not a snowstorm and it is not an overcast week. What that number is really telling you is that you do not need to worry when your room drops into the 50s°F (10–15°C), because that is comfortably inside their tolerance zone.

Outdoors

If you keep your Parson's outside, you are not going to use a basking lamp. The sun handles it.

What you have to provide instead is an enclosure that is big enough and densely planted enough that the animal can get out of the sun whenever it wants.

THE BACK-OF-HAND TEST



Comfortable, not hot.

SIGNS YOU HAVE GONE TOO FAR

1

Color washes out

An early sign.

2

Drops low

Getting away from the heat.

3

Gaping

Heat stress. Change something now.

If it gets past gaping, the eyes close, and that is the last warning.



Chapter 18

UVB

UVB is typically measured with the UV Index (UVI), a standard scale of ultraviolet intensity. It is weighted to the skin's sunburn response, but that is the same UVB that drives vitamin D3 production so it works for us.

Provide access to a UVI of 3 at the basking branch. That is the Chameleon Academy target. It is borrowed from what the chameleon community worked out with panther, veiled, and carpet chameleons, and Parson's keepers using it have been successful.

Chameleons Can Detect UVB

Chameleons do not see UVB, but they perceive it somehow. They deliberately find it and bask in it when they need it. Dr. Gary Ferguson studied this with panther chameleons and found that animals low on dietary D3 sought more UVB exposure. That is self-regulation from a need, and it is why the whole approach in this chapter is to make a safe amount available and let the chameleon decide how much of it to take.

What to Buy

Arcadia, Zoo Med, and Exo Terra all have the experience and the established business presence behind them, and I have used the T5 UVB bulbs from each of them successfully.

My preference is to use a stronger bulb raised above the cage top. Raising a stronger bulb puts UVI 3 in a wider part of the cone of light coming off the bulb, so the effective basking area is larger. If your fixture has to sit directly on the screen, a ReptiSun 5.0 or Arcadia 6% is the better choice.

Put it in a single-bulb fixture. The reflector in a single-bulb fixture sends most of the UVB down into the enclosure instead of spreading it in all directions.

Orientation on the cage top does not matter. Parallel to the front, front to back, diagonal — pick whatever fits alongside your white light bar and your basking fixture. The only thing that matters is that a branch sits at the right distance below it.

UVB LEDs are appearing and they look promising. But we have decades of experience behind T5 fluorescent technology and very little behind the new

technology. The concern is that T5 bulbs may be providing things we have never measured, and we will not know what an LED is missing until we learn it the hard way.

Setting Up the Bulb

Set the bulb height. Put your Solarmeter inside the enclosure, against the underside of the top screen, directly under the bulb. Move it around until you find the highest reading. This is the maximum UVB that will enter the enclosure. Raise the bulb above the enclosure until that reading is UVI 6, and lock it in at that height. If the bulb is sitting on the screen and the reading is below UVI 6, that is fine. What matters is the basking branch. If you cannot get UVI 3 at a basking branch your chameleon can reach, you need a stronger bulb.

Set the basking branch. Staying under the bulb, move the meter down until it reads UVI 3. The branch goes below that point by the height of your chameleon, because what you want at UVI 3 is the animal's back. If your chameleon is three and a half inches (9 cm) from belly to back, the branch sits three and a half inches (9 cm) below where the meter read 3.

Do not blast the enclosure with UVB. The animal has to be able to get away from it, and this whole approach depends on that. UVB does not need to cover the whole enclosure. Covering a portion of the basking perch is fine.

UVB output changes over the life of a bulb. A new T5 has about two weeks of burn-in where output runs high, then plateaus and decays slowly. Exact levels are not critical, so set it up and let it decay. Check once a month so you know what is going on inside your enclosure.

The Solarmeter

A Solarmeter 6.5 is the community standard for measuring UVI. It costs around \$200 to \$250. It ranks with a microscope as one of the two most important tools in chameleon husbandry. It is a true scientific instrument, and there is no substitute for it at the time of this writing.

Bulbs do not tell you what they are doing. Case in point, I once set up to record a video demonstrating how to measure a new bulb, and the new bulb had no UVB coming off it at all! Without a meter you do not know whether your bulb is good

for two years, one year, six months, or whether it was dead out of the box.

With a meter, you replace when it tells you to. Without one, replace every twelve months and estimate your placement: about 6 inches (15 cm) below a Zoo Med ReptiSun 5.0, Arcadia 6%, or Exo Terra Pro UVB 200 in a single-bulb reflector through 70% transmission screen, and about 12 inches (30 cm) below a ReptiSun 10.0 or Arcadia 12% through 70% transmission screen. Both distances are measured from the bulb to the basking branch, whether the bulb sits on the screen or is raised above it.

How Long They Need It

You can tell by looking. Is your chameleon healthy? Then however long it spends under the bulb is how much it needs. A healthy animal that spends twenty minutes a day up there is telling you that twenty minutes is the requirement.

UVB dissipates fast. Unless the chameleon is within about twelve inches (30 cm) of the bulb, it is not getting much, which means it has to make a deliberate trip to get what it wants. Like basking, this is not an all-day parameter. They go get it, they take what they want, and they are done.

UVB and Supplementation

UVB and supplementation are the same subject from opposite directions. Without UVB you have to supply D3 through the diet, and the body does not regulate how much D3 it takes in that way, so overdose is possible. With UVB, the body regulates its own production.

Parson's are sensitive to supplementation and it is easy to give one edema. I have an animal right now that got a dose of supplement, edema came up, and months later we are still working it out. UVB is the safer path to D3, which is why a Parson's keeper needs to be adept with UVB light rather than leaning on powder supplements.

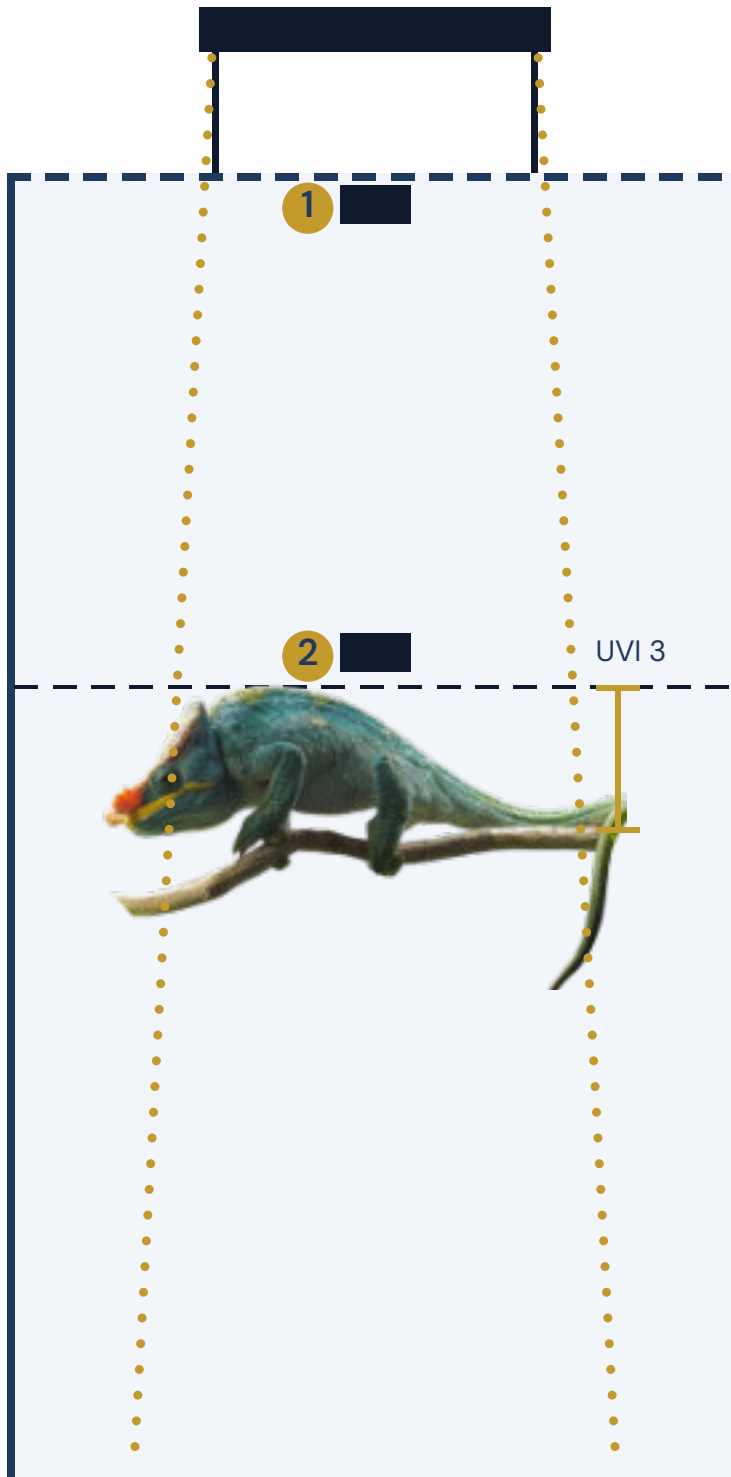
Outdoors

If your chameleon is outside, assume it is getting its UVB. That is the safe assumption and it is almost certainly correct.

SETTING UP THE BULB

Two Readings, Two Heights

T5 UVB in a single-bulb reflector, raised above the screen



1 · Set the bulb height

Meter against the underside of the screen, directly under the bulb. Raise the bulb until the highest reading is UVI 6.

2 · Set the basking branch

Move the meter down until it reads UVI 3. The branch goes one chameleon height below that, so UVI 3 lands on the animal's back.

Half the enclosure without UVB is fine. The animal has to be able to get away from it.

NO METER? STARTING DISTANCES

ReptiSun 5.0 or Arcadia 6% or Exo Terra Pro UVB 200	About 6 in (15 cm) to the basking branch
ReptiSun 10.0 or Arcadia 12%	About 12 in (30 cm) to the basking branch
Measured	From the bulb to the branch, single-bulb reflector, through 70% transmission screen
Replace	Every twelve months if not measuring with a Solarmeter 6.5



Bulbs do not tell you what they are doing. A new bulb can arrive with no UVB coming off it at all!



Chapter 19

Airflow

We take airflow seriously in chameleon keeping, and it used to be easy. We used screen cages and we got way more than the airflow we needed. Nobody had to think about it.

Things got complicated when we found out it was actually too much airflow. We were battling low humidity, and our chameleons were thirsty all the time.

Parson's keepers got a double dose of that. Parson's Chameleons like it humid, and Parson's Chameleons are notorious for drinking and drinking and drinking. That is because they were dehydrated. A chameleon in a screen cage in an air-conditioned or heated house is sitting in dry air all day and has to make up the difference somehow, which means more misting and more water. And Parson's Chameleons require more hydration than the more common panther.

The way we combat low ambient humidity is, in part, with a hybrid enclosure. Enclosed sides let us retain the humidity we are putting in, so the chameleon is not losing it as fast as we can add it.

But increasing the humidity we store by decreasing the ventilation means we now have to ask a question we never had to ask before. How much ventilation does a chameleon actually need?

What the Chameleon Needs

The good news is that it really is not much that the chameleon needs.

An enclosure with solid sides, a screen top, and vents down at the bottom produces the chimney effect. Air inside the enclosure warms, rises, and goes out the top, and that pulls cooler air in through the vents below. You get a slow, continuous exchange that keeps fresh air moving through without quickly stripping out your humidity.

The chimney effect is built into our modern enclosures. With an enclosure that has bottom vents and a screen top, the chimney is running from the day you set it up.

If air exchange were the only thing we needed, this chapter would end here.

What the Enclosure Needs

The second requirement is that the enclosure has to dry out during the day.

So yes, we are fighting ourselves. We spend all night putting water into the enclosure and then we spend all day trying to get water out of it.

But keep in mind that this is not because of the chameleon. The chameleon would enjoy humidity all day long and would not complain. The problem is that surfaces that never dry out become unhygienic. That is the reason we bring humidity down during the day.

Whether you need help getting there depends almost entirely on where you live. In the dry Southwest, or here in Southern California, the enclosure dries out on its own. In the Southeast, where the ambient air is already saturated, you may have a real problem getting an enclosure to dry at all.

How You Know You Have a Problem

Look at the enclosure sometime between noon and three o'clock. The surfaces should be dry.

If your branches are still wet in the middle of the afternoon, you need more airflow. If they are dry, you do not. The branches are the critical test because Parson's Chameleons are prone to sores on the bottom of their feet and moist branches are a major contributor, along with perching in one place for long periods of time.

You can tell in one day. You do not have to wait for smells, or mold, or a sick chameleon. Set up your enclosure, run your night schedule, and look at the branches the next afternoon.

Too Much Airflow

Too much airflow does not have a measurement. No one in the community has put a number on it. What you are avoiding is a draft, meaning a noticeable constant wind inside a small space, which is not something that happens in a forest.

So the test is a judgment call. Look at how the air is moving in the enclosure and ask whether you would want to stand in it. I do not like giving that answer, because “use your judgment” is what people say when they do not have anything better. In this case we do not have anything better yet. If someone works out what to measure and what the number should be, I want to hear it.

Fans

When you do need more airflow, the answer is a fan, and the convenient piece of equipment is a computer fan.

There are a lot of sizes and a lot of strengths available, and the good news is you do not need much. Three- to four-inch (8–10 cm) fans cover most situations.

Look for fans sold as USB-powered. Plug the fan into a timer and you have a controllable fan for very little money.

Three Ways to Mount It

Different keepers place their fans differently and all three of these work.

Across the top. This is what I do. Set the fan on edge on top of the enclosure so it blows across the top rather than into it or out of it. The warm air that collected under the lights vacates, and when you pull air off the top of the enclosure it pulls air up from the bottom. You get the chimney effect, accelerated.

Pulling air out. You can mount the fan so it draws air from inside the enclosure and pushes it out the top.

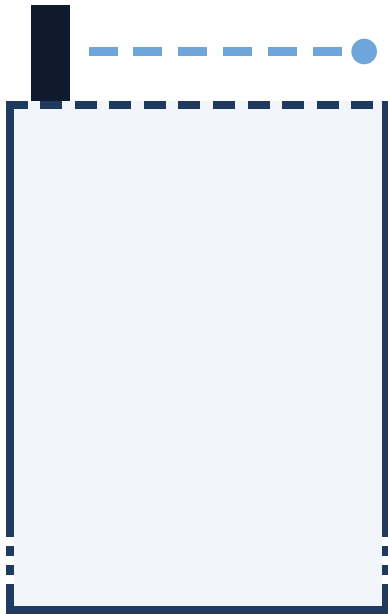
Blowing air in. On Parson’s enclosures you sometimes need something more aggressive, because we are talking about four-foot-wide (1.2 m) enclosures and pulling air out of that volume is often too weak to do anything noticeable. In this case, you can blow air directly into the enclosure instead.

The size of the enclosure is what makes that last option acceptable. The smaller the cage, the less you want air blowing in, because you will create a draft the animal cannot escape. In a large Parson’s enclosure there is enough space that the chameleon is almost certainly not sitting directly under the fan, and it can move if it does not like where the air is.

Play with it. The afternoon surface check tells you whether it is working, and you can add a second or third fan if one is not enough.

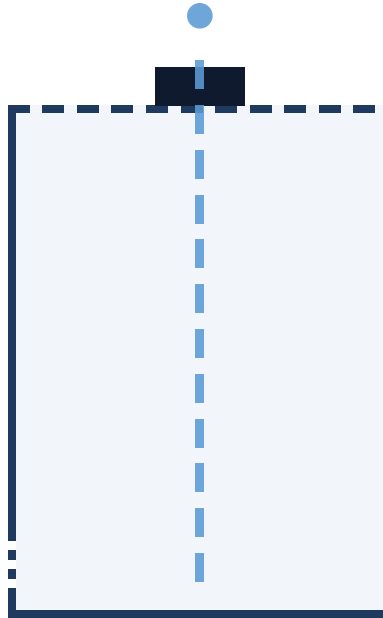
THREE WAYS TO MOUNT A FAN

All Three Work



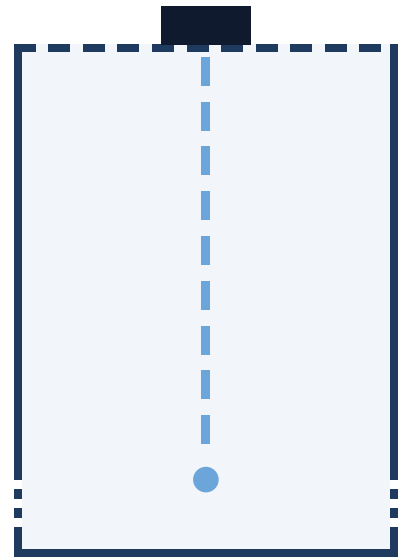
Across the top

On edge on the cage top, blowing across it. What I do.



Pulling air out

Draws air from inside and pushes it out the top.



Blowing air in

More aggressive. For large enclosures only.

A 3- to 4-inch (8–10 cm) USB computer fan on a timer covers most situations.

THE AFTERNOON TEST

Look at the branches between noon and 3 PM.

Still wet

You need more airflow.

Dry

Mission accomplished



A fan clears out the warm air under the lights and the enclosure dries during the day. This custom system was designed, programmed, and manufactured by Nate Rowley. Photo courtesy of Nate Rowley



Chapter 20

Hydration

Dehydration is a primary risk factor in Parson's Chameleon husbandry.

An animal that comes off an import that did not maintain adequate moisture can take weeks or months to recover. If it was dehydrated in transit, the organs can be affected, and some animals never fully recover from that. Some do recover, but it takes a long time and there is nothing you can do to hurry it.

That is the worst case and most readers will never see it. I lead with it because it establishes the importance of hydration. This is not a parameter where being a little off for a while produces a little problem. Getting hydration wrong is how you lose a Parson's Chameleon.

The Thirsty Chameleon Problem

For decades, Parson's Chameleons have been described as very thirsty animals that will continuously drink.

In the wild they are not doing this. That tells us something important: if your chameleon is constantly drinking, it is looking for more hydration.

The reputation for always being thirsty is a consequence of husbandry, not a trait of the species. It comes from the era when we said all chameleons needed screen cages. Most homes do not offer the humidity a chameleon needs, and a screen cage in a dry house means the animal is losing moisture all day and trying to make it up by drinking. Air exchange is real and necessary, but 100% ventilation sabotages your husbandry if the ambient environment is not already ideal.

Which leads to the counterintuitive goal of everything in this chapter.

The Drinking Paradox

The goal is for your chameleon to not want to drink.

If a chameleon is drinking in front of you, it is because it has reached the point of needing water. That does not necessarily mean your husbandry is bad or your chameleon is unhealthy. But through strategic misting and fogging we can keep a Parson's in a constant state of healthy hydration, and the sign that we have succeeded is that when we offer water on top of what we are already providing, the animal is not interested. It already has what it needs.

That is the standard I want us working toward.

Hydration Is Cumulative

There are four ways a chameleon takes on or holds water: drinking, eating, breathing, and conserving.

You can combine these in any way that adds up to a hydrated chameleon. That is why there are so many different hydration methods in the chameleon community and why so many of them work. Not all of them are equally effective or equally natural, though, and our job is to build a strategy that produces a hydrated animal in the most natural way available.

Drinking is the most obvious and the fastest. The chameleon licks water off leaves. In nature this happens when it rains and when there is morning dew. We provide it with a mister or a dripper. The drawback is that spray is disruptive — even a thirsty chameleon does not want to be hit in the face by surprise — so it pays to be strategic about when and how the mister runs.

Be aware that Parson's are slow to respond. A mister comes on at one end of the enclosure and it can be ten minutes before the animal acknowledges it and decides to head over. Then it may drink for ten or twenty minutes. Do not judge a misting event by what happens in the first two minutes. A Parson's prefers that water comes to them.

Eating brings water in with the food. Different feeders carry different moisture levels and you can watch this yourself — switch from crickets to a couple of days of silkworms or hornworms and you will see the poop consistency change. That said, I do not rely on moisture from food when putting together my hydration schedule. I want the hydration schedule to be complete on its own so that feeders can be chosen purely for their nutritional value. Moisture from food is a bonus on top.

Breathing is the one people overlook and it is the foundation for the Chameleon Academy Naturalistic Hydration Schedule. Fogging an enclosure at night is an unexpectedly effective way to hydrate a Parson's. The animal sleeps in the fog and breathes it in. What happens after that has not been proven. Our best explanation is that the water droplets reach the lungs and are absorbed into the

bloodstream there. It is slow, gentle, and happens while the chameleon is asleep and not being bothered by anything.

An adult male Parson's Chameleon was used to establish that fogging is a legitimate hydration method. James Cross, on a Chameleon Academy live session, described hydrating his adult male Parson's Chameleons on nothing but nighttime fog. But proving it can work is not the same as recommending it on its own. We run misting alongside our foggers so there is a backup. The method I am presenting does not rely on fogging alone, but fogging is a major component.

Conserving is the passive lever. The drier the air, the more moisture the animal loses simply by breathing. High humidity means less loss. This is where the high nighttime humidity targets come from.

Redundant Systems

If fogging alone has been shown to work, and misting alone has been the fallback for decades, why run both?

Because together you get the benefits of each. Fogging gives you slow, gentle hydration. Misting gives you a fast top-off. And redundancy means your chameleon is covered when a piece of equipment fails or a seasonal change demands more water than you planned for.

Misting is most effective during the day. Fogging is most effective at night. Use both.

Water Quality

Use RO or distilled water in your fogger.

Whatever is in the water gets aerosolized and breathed in. This is not the place to use tap water. Mineral content is what kills fogger and mister equipment, so clean water protects your gear as well as your animal.

What You Need

Four pieces of equipment make a hydration environment.

Enclosure. A hybrid with solid sides is what allows you to control ventilation and hold humidity.

Drainage. It needs to be solved before you buy anything, because everything you put into the enclosure has to leave it.

Mister. Any mister that can produce a fine mist will work. The MistKing brand is the top choice, but there is an enormous number of offshore products being made available. Quality of off-brand products varies widely.

Fogger. For a commercial option, the Exo Terra Humidifier is the best available. It is sold as a humidifier and it is really a fogger. DIY foggers are popular in the Chameleon Academy community due to their high power performance.

Measuring Hydration

You need a way to know how you are doing. There are three tests and they work on three different timescales.

Immediate — behavior. Offer water from a dripper and watch. A dehydrated chameleon goes to drink, and you can read the severity in how urgently it does so. A hydrated chameleon ignores the water or is annoyed by it. You can build a dripper out of a plastic cup and a pin: poke a small hole, fill it, set it on top of the enclosure so the drip lands on a leaf the animal can easily reach.

Weekly — poop. Hydrated poop is moist and firmly packed. Dehydrated poop is dry and crusty.

Long-term — shedding. A good shed looks like the chameleon is exploding in white and is over in a day. A bad shed sticks, comes off in pieces over many days, or clings to the new skin. There are several possible reasons for a bad shed, but check hydration first.

Adjusting

If you need more hydration, add misting events. If you need less, remove misting events and/or shorten the nighttime fogging.

Reducing is simple. Adding is where you want a strategy rather than just more of everything, because extra hydration events may not hurt your chameleon directly but they do affect hygiene. Constantly wet surfaces are unhygienic, and an animal whose feet are never dry can develop sores on them. Assuming you have your drainage figured out, the limit on how far you can push hydration is that surfaces need to dry during the day.

The better way to add water is to lengthen a single deliberate rain shower rather than scattering more misting events through the day.

HYDRATION IS CUMULATIVE

Four Ways Water Gets In, or Stays In

Drinking

The fastest. Licking water off leaves after rain, morning dew, or the misters. Or just letting the rain fall onto their tongue.

Eating

Water comes in with the food. Different feeders carry different amounts.

Breathing

Night fogging hydrates the chameleon while it sleeps.

Conserving

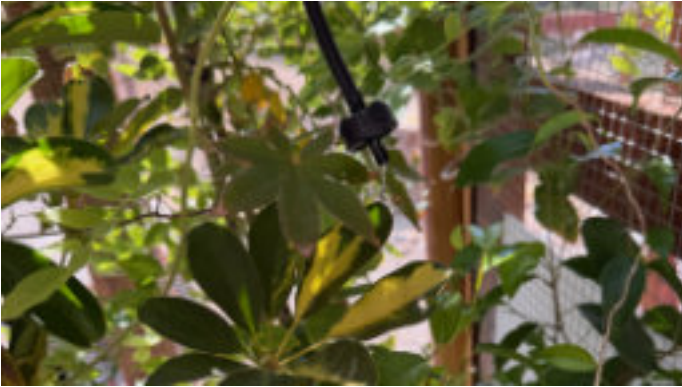
High humidity means less water lost with every breath.

MEASURING HYDRATION

Three Tests, Three Timescales

Immediate · behavior

Offer water from a dripper. A hydrated chameleon ignores it.



Weekly · poop

Hydrated poop is moist and firmly packed. Dehydrated poop is dry and crusty.



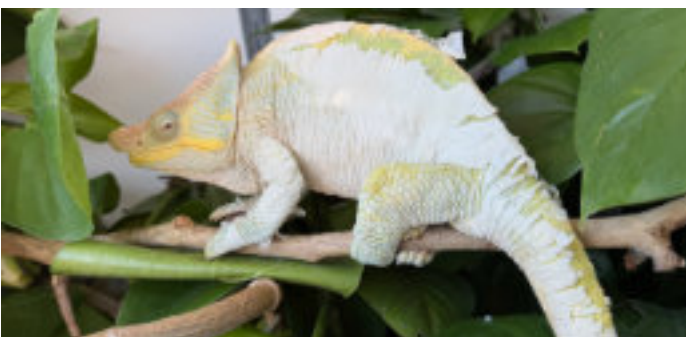
Moist and firmly packed



Dry and crusty

Long-term · shedding

A good shed is over in a day. A bad one sticks and comes off in pieces.



Over in a day



Pieces over many days



Breathing: fogging at night hydrates the chameleon while it sleeps.

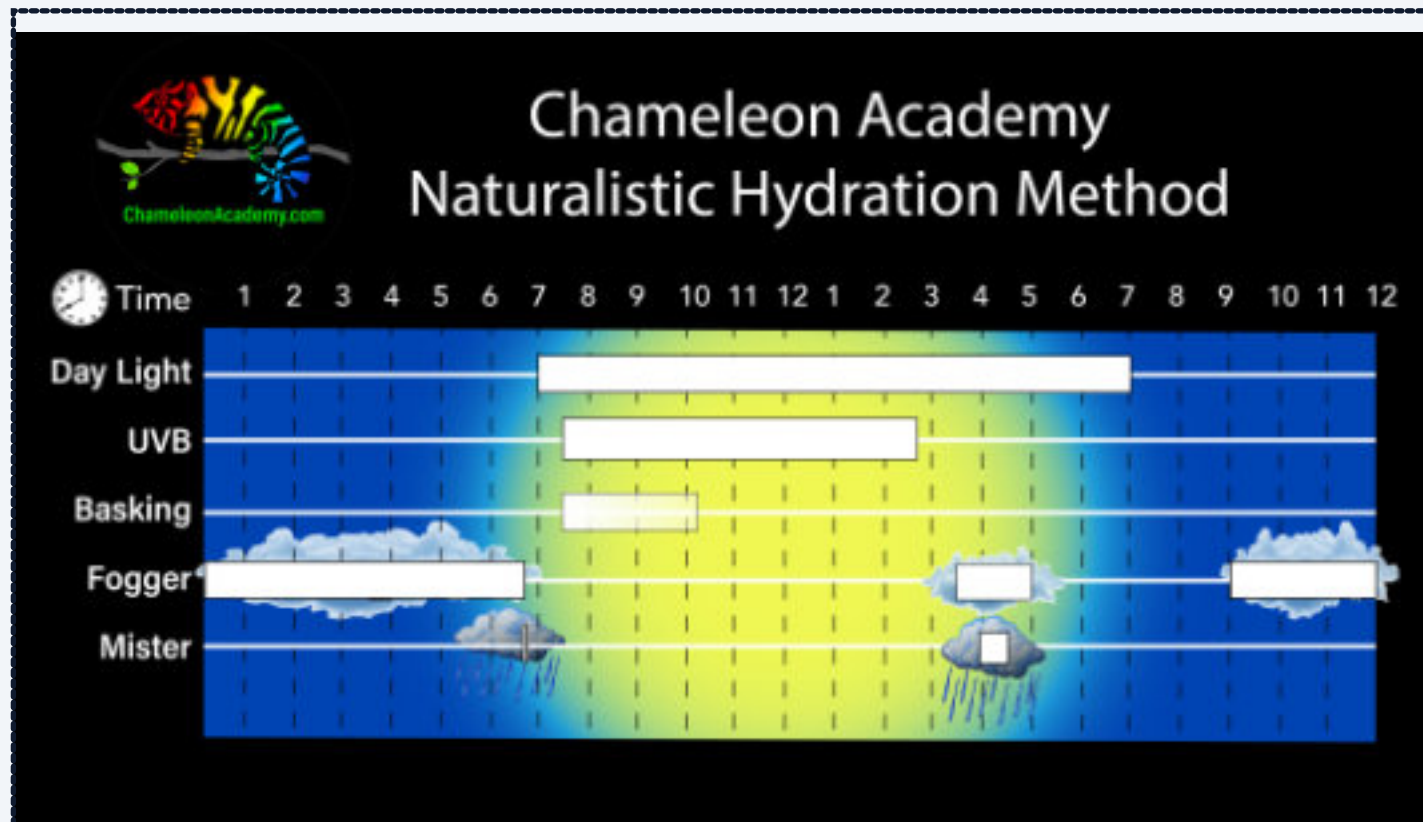


Chapter 21

The Daily Cycle

It is time to bring the lights and hydration equipment together with a schedule that has them creating an environment to enrich our chameleon. Before we start I want to make it clear that there will be many different schedules and combinations that will work. The method I am presenting here is just one of many that you can use. This one was specifically designed to simulate ideal naturalistic conditions and be applicable in the widest range of conditions.

This schedule is my baseline. Everything you build can start here. This schedule has the day start at 7 AM and end at 7 PM.



Reading the Chart

Daylight: On at 7 AM; off at 7 PM. The daylight runs about twelve hours. This is the white light by which the chameleons see and lets them know it is time to be awake.

UVB: On at 7:30 AM; off at 7 PM, or at 3 PM to prepare for the 4 PM afternoon rain shower.

Basking light: On at 7:30 AM; off at around 10 AM. The block on the chart is deliberately drawn as a gradient rather than a solid block because basking really has no fixed length. It runs as long as your chameleon needs it, which depends on

the animal, how much your cage retains heat, and on your ambient temperature.

Fogger: On at 9 PM; off at 6:30 AM. The fogger runs through the night and shuts off before the lights come on. It can also be part of an afternoon rain shower. For the 4 PM rain shower, turn the fogger on at 3:30 PM and leave it running 15–30 minutes after the mister turns off.

Mister: Runs three times: a short priming burst at the start of the night (30 seconds at 8:45 PM), another just before the lights come on (30 seconds at 6:30 AM), and the afternoon rain shower (5–30 minutes at 4 PM).

How the Night Hydrates

The foundation of this schedule is that nighttime fogging does much of the hydration, gently, while the chameleon is asleep.

Night hydration starts after lights out. I run the mister about thirty seconds to coat the surfaces. This is not for drinking. It prepares the enclosure for the fogging cycle. The fog will eventually moisten everything on its own through constant presence, but priming with the mister gets the process started.

There is no exact time the fogger has to start. I begin it around the time the mister is priming and let it run all night, then shut it off before the lights come on.

Just before the lights come on, the mister runs another thirty seconds so every surface in the enclosure is covered. When the lights come on, the chameleon wakes to a world covered in dew and can top off by drinking if the fogging was not enough. That redundancy is the point. It lets variation in ambient humidity or an equipment failure be absorbed without the chameleon paying for it.

The Afternoon Rain Shower

The afternoon rain shower is your lever to pull when you need more or less hydration. If I have a normal day and the nighttime hydration does the job, I do not need an afternoon rain shower. Or, most often, I run it a short five minutes. But during low-humidity times of the year I can run it longer. I designed this hydration event in to give an easy way for you to adjust the hydration either way. When in doubt, have the rain shower until they stop drinking.

This is not an arbitrary addition. Afternoon rain is what happens in the wet season

forest these animals come from. Now, this is more than just a misting event as I have used various pieces of lighting and hydration equipment to simulate clouds coming in and rain starting.

The drawback of daytime misting is that sudden spray annoys chameleons. Even a thirsty chameleon does not want to be hit in the face by surprise. But chameleons are very good at detecting patterns, and if you give a consistent warning before the water starts, you can run an afternoon shower without the annoyance response.

Here is how I signal it.

I turn off everything except the main white light. My basking light has been off for hours by then. The UVB fixture going dark is part of the signal. The UVB has already done its job by that point in the day. Shutting it off in the afternoon is a second use of the same fixture — that whole group of lights dimming is a pattern the chameleon learns, and it reads as cloud cover coming in. Note, even though chameleons may not see UVB, they can perceive it and there are ample visible components to the UVB bulbs or LEDs. So, turning off the UVB light is effective as a warning signal.

Once the enclosure has darkened a little, I start the fogger to bring humidity up. Direct the fog into a plant rather than out into open space. A visible cone of fog coming out of a tube is not something that happens in nature and, if done during the day, the chameleon notices it and may react with concern.

Take your time with this. About an hour for the whole progression is what I use, and there is no reason to rush it. The lights going down and the fog coming up are the signals. Once your chameleon has settled into them, start the mister and run it as long as you want. You can place your rain shower any time during the day that you want. I do mine in the late afternoon.

The Rain Shower Is Your Lever

This is the feature of the schedule I like most. If you need to move your hydration up or down, you lengthen or shorten the afternoon rain shower. Everything else stays where it is.

I run five minutes daily because I am in a moderate humidity area. When seasonal

desert winds drop my humidity into single digits, my misters can run most of the day. Someone in a humid climate will find that a daily shower means the enclosure never dries out, and they are better off leaning on night fogging with minimal daytime misting. Some keepers skip the daily shower entirely and run two longer ones a week.

Remember when determining how long to mist — you want your chameleon to be hydrated (check the poop), but the cage surfaces have to dry out during the day! Constantly wet surfaces are a health hazard for Parson's Chameleons, especially their feet!

Take this schedule as a baseline and adjust the shower to your ambient conditions.

Airflow

Fans are a great tool to help surfaces dry between hydration events, which is what keeps the enclosure hygienic at the humidity levels this species wants.

Whether you need fans at all, and how much, depends entirely on how well your enclosure dries during the day.

Feeding

Feeding does not have a place on this chart.

Chameleons eat at all hours. If food is available they will take it, and I have not seen evidence that timing relative to basking or hydration matters for this species. So there is no feeding window to get right. The one thing to keep in mind is that you don't want any rain shower to drown any bugs in the feeder run cup. So it is a good idea to feed in the morning and take the cup out in the afternoon before the rain starts.

Conclusion

If you take anything away from this schedule, it is these three things: much of the hydration happens at night, the enclosure needs to dry during the day, and the chameleon should get some warning when conditions are about to change.

HOW I SIGNAL THE AFTERNOON RAIN SHOWER

About an Hour of Warning**3 PM****Lights dim**

Everything off except the main white light. The UVB going dark is part of the signal.

3:30 PM**Fog rises**

The fogger starts, directed into a plant rather than open space.

4 PM**Rain**

The mister runs for 5 to 30 minutes. Lengthen or shorten it to move hydration up or down.

After**Fog off**

The fogger shuts off about 15 to 30 minutes after the rain shower ends.

THREE THINGS TO TAKE AWAY

1

Much of the hydration happens at night.

2

The enclosure needs to dry during the day.

3

The chameleon should get some warning when conditions are about to change.



Blue, a male Yellow-lipped Parson's Chameleon, considers me during a brumation state

Chapter 22

The Seasons & Brumation

Parson's Chameleons have distinct seasons in Madagascar and those seasons drive a number of their behaviors.

The good news is that Parson's Chameleons will eventually adjust to your seasons. Seasonal detail matters most to people who breed Parson's and hatch them out. The most important thing to be familiar with when you are just starting out keeping them is brumation, which is a defining part of a Parson's Chameleon's life.

The Madagascar Year

Parson's Chameleons come from the east coast of Madagascar. The year there splits roughly in half. The wet season runs from around November to April and the dry season from May to October.

For those of us in the Northern Hemisphere, everything is flipped. Their cool dry season falls during our summer. Their warm wet season falls during our winter.

Unsurprisingly, the wet season brings a lot of rain and the dry season brings less. You will hear about dry seasons in Madagascar that are harsh enough that some species survive them only as eggs in the ground. That is the west coast. On the east coast, where Parson's live, the dry season simply means it rains less. Their dry season is nowhere near as severe as what chameleon species in western Madagascar go through.

What matters for us is that Parson's are attuned to that variation. It is what tells them when to mate, when to lay, and when the eggs should hatch.

Photoperiod

Parson's Chameleons live in the southern tropics — roughly fifteen to twenty-two degrees south of the equator. Far enough out to have a real seasonal cycle, close enough in that day length only swings by about two hours across the year — roughly eleven hours of daylight at the shortest day and a bit over thirteen at the longest. That might be a seasonal trigger, but, if it is, it isn't obvious, and I am unaware of anyone who has shown that it makes a difference.

So you are able to run your lights twelve hours on and twelve hours off year-round.

Replicating the Dry Season

The seasons are named for rainfall, so the obvious way to replicate them would be to give more water in the wet season and less in the dry. I do not do that. I hold hydration at the same level year-round and I differentiate the seasons with temperature alone.

My reasoning is that temperature is what the animal appears to be reading. Brumation begins when it gets cold and ends when it warms up. Breeders trying to crack the Parson's code have tried changing the moisture levels of incubating eggs and have reduced hydration for the dry season to understand what triggers stages in the reproduction schedule. I am not aware of findings from this, though that could easily be part of the hidden tricks. From the perspective of a keeper wanting the best for their pet I can say that you can get a healthy brumation from changing temperature and maintaining daily hydration. That said, in brumation there is much less movement and so it is even more critical to make sure the cage and branches dry out under your Parson's feet.

Brumation

Brumation is a period of dormancy driven by dropping temperatures. The chameleon settles in, hunkers down, and enters a very low-energy state for the cool season.

It slows down, reduces activity, and stops or nearly stops eating. But unless the temperature lows are extreme, the eyes are open and the animal is aware of everything going on around it. This is a normal part of a Parson's life.

During a true brumation your Parson's will not eat. One of mine goes into brumation and refuses food for six months with no interest whatsoever. He eats hard for half the year and ignores food for the other half. Occasionally he will perk up if I offer a grasshopper, but only occasionally.

The first brumation sends a lot of new Parson's keepers into concern mode as they think something is wrong. If the weather is getting cooler and your Parson's stops eating, brumation is very likely the reason!

Brumation appears to function like a metabolic reset. The animal burns stored fat, the body rests, and it comes out in spring in excellent condition. A Parson's

Chameleon can go six months without eating and look as good coming out as it did going in. That assumes it went in healthy and carrying good weight. Keep an eye on its condition through brumation. An animal that is losing too much starts to lose the structure in its face and look thin, and that is your signal to get help.

When It Happens

Brumation happens on its own. As the ambient temperature drops, the animal detects it and goes into the state. You do not have to induce anything.

Where I notice mine going in is when nighttime lows get into the low 50s°F (10–12°C). After a stretch of that, they slow down. They snap out of it when nighttime lows come back up into the 60s°F (16–21°C).

Both of those are my personal observations from my own animals in Southern California. For outdoor animals here, brumation typically runs November through April or May. A six-month brumation is usual.

Your nighttime target during this period is 50–59°F (10–15°C).

Animals kept fully indoors in heated homes may have a much less defined brumation, or may not brumate at all if temperatures never drop enough to trigger it. If you keep your Parson's indoors and want it to brumate, you have to bring the temperatures down somehow, and this is the challenge of indoor keeping. A cooler room, a garage, turning the heat off, even air conditioning are all ways keepers get there. Aim for nights of 50–59°F (10–15°C) and days in the 60s°F (16–21°C).

Do They Need It?

You do not have to put a Parson's through brumation, and some keepers deliberately skip it for juveniles and sub-adults so the animal gets two solid years of growth first. As far as we can tell that works fine.

I would not do it for the animal's whole life, though. A Parson's Chameleon is built to take six months of the year off, and that is probably part of why they live as long as they do. I let mine rest, and I would encourage you to do the same once your animal is past those first couple of years.

What to Do During Brumation

Keep providing water, even if on a reduced rate, but make sure their branches dry out. Keep offering food occasionally; most animals will refuse, and that is fine. Do not force it. Maintain your normal white light and UVB schedule. Check on the animal regularly but do not handle it. Let it rest.

You will know when it is over. They become active around the enclosure again and will snap up any insect you offer.

Is It Brumation, or Is Something Wrong?

A motionless Parson's that has not eaten in weeks is exactly what brumation looks like. It is also what a sick chameleon looks like. So you need a way to tell them apart.

The eyes are the tell. A brumating Parson's keeps its eyes open. It settles into a spot, stops moving, stops eating, and watches you. It is aware of everything going on around it and simply has no interest in participating. But this is a reliable method only if the temperatures do not start dipping below the 50s°F (10–15°C) at night. When temperatures, day or night, start dipping lower, your chameleon may close its eyes and have a deeper rest. The chameleon will bounce back without an issue when things warm up, but this breaks any easy formula to determine if something is wrong by looking at the eyes. This is where experience comes in and if you do not have the experience yourself you need to have a mentor who can help.

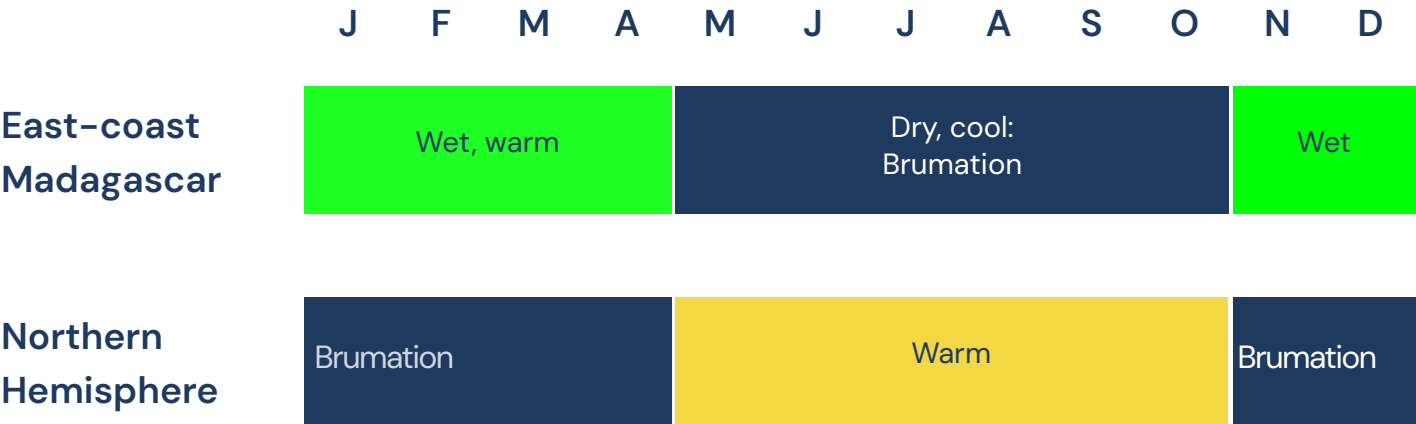
Brumation at a Glance

Nighttime	50–59°F (10–15°C)
Daytime	Mid - to upper 60s°F (16–21°C)
Lights	Normal white light and UVB; basking light off
Water	Keep hydrating daily; make sure surfaces dry during the day
Food	Offer occasionally; refusal is normal



A brumating Parson's Chameleon generally keeps its eyes open and watches the world around it.

THE MADAGASCAR YEAR
Everything Is Flipped

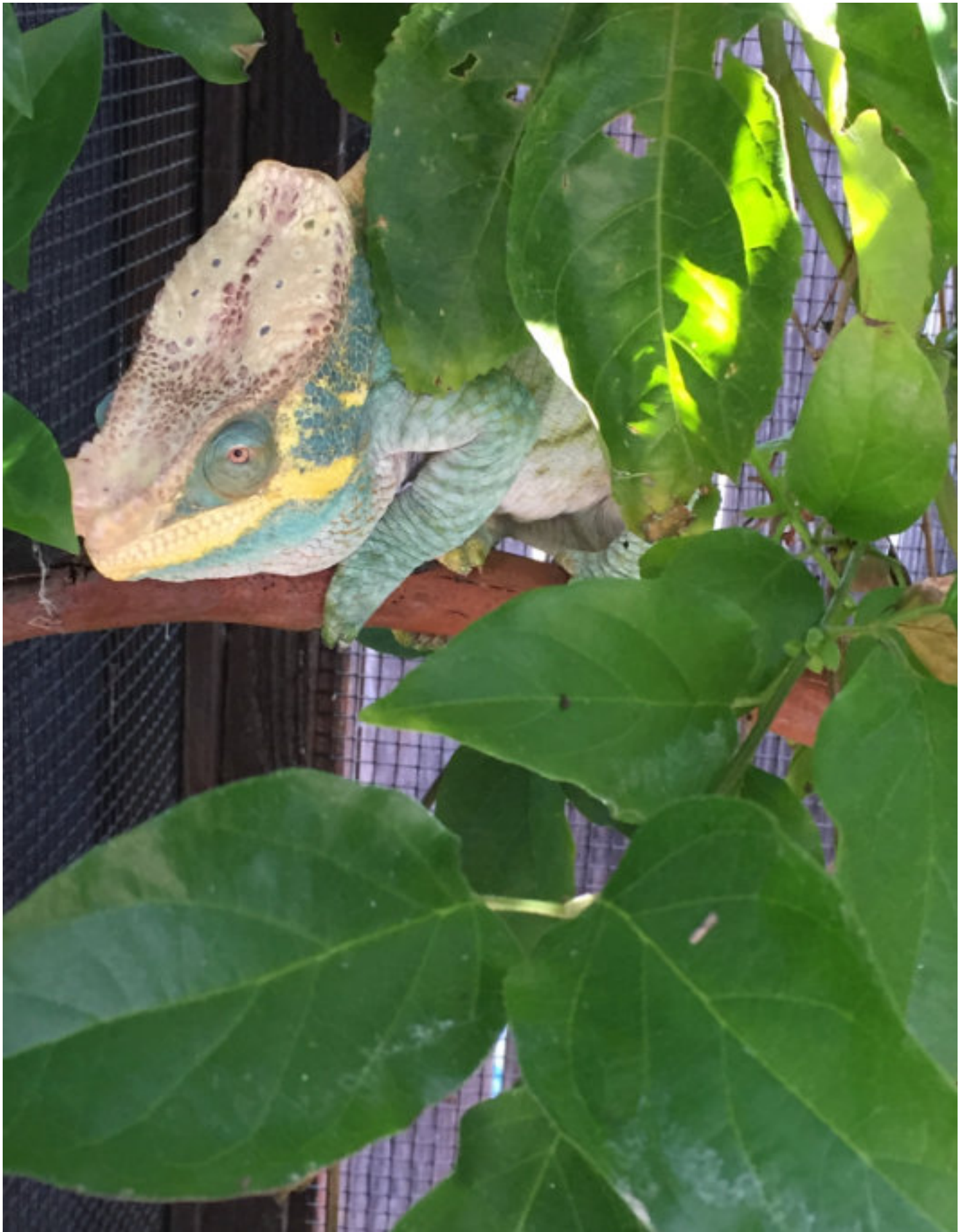


Their cool, dry season falls during our summer. Their warm, wet season falls during our winter. Your Parson’s adjusts to your seasons, and brumation follows your cool months: for outdoor animals here, November through April or May.

WHAT STARTS AND ENDS IT

Brumation Trigger Nighttime lows drop to the low 50s°F (10–12°C), for a stretch.	Night target during 50–59°F (10–15°C) during brumation.	End Brumation Nighttime lows back up into the 60s°F (16–21°C).
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Personal observations from my own animals in Southern California.





Part Four

Life with a Parson's Chameleon

Your Parson's is on its way. This part follows it home and through its life with you: the first days, feeding, handling, quarantine, the health problems to watch for, and, if you want to take the next step, breeding.

IN THIS PART

The chapters follow the order you will need them, starting the week before your chameleon arrives. Quarantine runs alongside everything from that first day. Find a reptile vet before you need one. The medical chapter will help you recognize a problem and talk with your vet, but it is not a treatment guide. Breeding is optional; keeping one Parson's well is its own contribution!

PART GLOSSARY

Double Cool Period

An incubation method using two cool periods. One of the two methods currently used for Parson's eggs.

Fat Pads

Fat stores in the abdomen. In heavily fed females they can grow large and are suspected of contributing to egg-laying problems.

Feeder Run Cup

A cup mounted in the foliage that holds live feeders where the chameleon can see and reach them, keeping them off the floor.

Hand Feeding

Offering a feeder insect from your fingers or soft tongs. The best way to build trust with a Parson's.

Lay Bin

A container of moist sand or soil where a gravid female can dig and lay her eggs.

Oocyst

The tough, egg-like stage of coccidia and similar parasites, passed in feces.



Chapter 23

Bringing Your Parson's Home

There are two weeks in this process that are packed with activity and nerves, and they are on either side of the day your Parson's arrives. This chapter covers both of them.

The Week Before

Have the enclosure running

A lot of people order their equipment so it arrives just in time and plan to throw the whole thing together the night before the chameleon does.

That is not the optimal plan.

Set the enclosure up well before your Parson's is due, and then let it run. Lights on, mister running, fogger running, plants in and growing. Give it a week of operation while nothing is depending on it. Remember that a new arrival goes into a quarantine setup, not your finished bioactive build.

That week is when you find out that the mister nozzle is aimed at the wall, that the drainage is slower than you expected, or that the room gets warmer in the afternoon than you thought. You want to discover those things before your Parson's is in their new home.

The payoff is walking into arrival day knowing the system works. Remember, low stress for both you and your chameleon is a worthwhile investment!

Have the food already here, and already fed

Get your feeders in a couple of days ahead, sized appropriately for the animal you are bringing home.

Start gut loading them the moment they arrive. You have no idea how well-fed they were before they got to you, and the nutrition they provide is your responsibility now. Two days of feeding your feeders before your Parson's arrives means the first meal in its new home is a good one.

Picking the ship date

Your breeder decides whether it is safe to ship. They are looking at the weather not just where they are and where you are, but at the hub cities in between to

make sure the trip will be as safe as possible.

You agree on the day together. Breeders tend to avoid shipping on Mondays, because the weekend's backlog is moving through the system. They also tend to avoid Thursdays and Fridays — Friday because you cannot pick up on Saturday, and Thursday because a one-day delay leaves your chameleon sitting somewhere over the weekend.

Priority overnight, always. Your breeder should be using the fastest service available. If anyone offers to ship you a chameleon by any slower method, do not work with that person.

Understand the live arrival guarantee before you need it

Get the terms straight in advance, because they vary and because they usually come with conditions — some breeders require you to contact them at the moment you pick the animal up.

Everyone does this a little differently and every breeder wants you to end up happy, so ask.

Put your vet on notice — poop incoming!

A veterinarian can be someone you see only when something is wrong, or a regular partner in maintaining the health of your chameleon. It all depends on your experience and confidence. Some people go for yearly checkups with their vet and this gives the vet the advantage of having history with the chameleon so if something goes wrong they aren't coming in cold. If this sounds like an arrangement that would give you peace of mind, you can make an appointment for about two weeks after your chameleon comes home to have your vet establish a baseline health assessment.

Whether you partner closely with your vet or not, it is a great idea to have a fecal check done for parasites. Even captive-hatched chameleons can have parasites and it is a good idea for you to know what is going on inside your chameleon. You can't predict when you will get a poop, but you can make sure you understand the protocol for getting a fecal analysis done with your vet. Usually, you drop off the fecal sample in a zip-lock bag marked with your name and your chameleon's name and they take it from there. Talk to them ahead of time to be ready. You

could open the shipping bag and find they pooped on the way over — don't waste that poop!

To collect the poop, turn a zip-lock bag inside out, use it to grab the poop, turn it right side out, seal it, and refrigerate the sample until you can get it to the vet within 24 hours. You usually do not have to have an appointment to drop off poop for a fecal exam. You will have to have an appointment to get any medicines necessary for whatever they find, but that is after they report back that they found something.

Arrival Day

Go to the hub

You arranged hub pickup. Do not have your Parson's Chameleon be put on the delivery truck. Take the morning off and be there when the shipping hub opens.

The alternative is your chameleon riding around the city in a delivery vehicle with someone who is not thinking about whether the sun is hitting the box. In the past, I found the delivery person had left a live reptile on my front step without so much as a knock.

Document before anything else

When you get home, open the box, take the chameleon out onto your finger, and take photographs and video. You are recording the condition it arrived in. Then send that report to your breeder. If the animal looks good, they will be delighted to hear from you — they have been anxious since the moment the box left, because these are animals they care about. Have mercy on them and tell them it arrived well!

If something is wrong, the pictures and video go to the breeder along with the question: what should I do? Get your next steps from them.

If you cannot reach your breeder and you make the call to go to a vet on your own, you are likely to be responsible for that bill. Any decision you make independently is a decision you are responsible for. But once again, your breeder will have their own terms and conditions. Make sure you understand them.

A special note for wild-caught imports

How an imported animal was kept before it reached you matters a great deal. This is why working with established exporters/importers is so important. The good news is that the import process has evolved and we routinely get well-cared-for imported chameleons.

Then water

Put the chameleon in the enclosure and turn the misters on.

This is what you do whether the animal looks perfect or looks rough, and if there was a shipping problem it was almost certainly heat, or dehydration, or both. Cool room temperature and hydration are the answer to both.

Your Parson's has been most of a day without water. Good breeders hydrate heavily before shipping, but that is still a long time.

Understand that a Parson's is slow about just about everything. It may take ten minutes for the animal to register that there is water coming down — and then drink for another ten or thirty or longer. Prepare ahead of time to water them for an afternoon. This is not the time to ration water! Run the mister, have bottles of water to replenish the water reservoir, and constantly remove the wastewater. When in doubt — just keep it going! My personal approach for any chameleon (especially Parson's) that comes to me is to set them up in a heavily planted outdoor cage and run the hose on mist mode for a couple of hours.

Remember to keep an eye open during the long misting session for your first poop to send to the vet for fecal analysis!

Once the water is off, go ahead and offer food and see if they'll take it. But do not expect it to be taken. If the animal is hungry, wonderful. If not, that is fine and normal. It has had quite a day.

Then leave it alone

I know how hard it will be to leave your Parson's alone. You have waited months, possibly years, and the animal is finally in your house and you want to look at it.

But your Parson's has been through a lot. Put it in an enclosure where it can hide if

it wants to, get it hydrated, and then step back and let it settle in. At some point it works out that this is home now, and it starts exploring.

The Week After

The first 24 hours are for observation

Some chameleons come out of the box with the energy still up and spend the day circling the enclosure, exploring every corner. That is normal. Others hide in the foliage and stay there. Also normal. Which one you get depends entirely on the animal.

Restless activity should settle down after a day or so.

The point is that you observe, but do not diagnose anything on day one. After 24 hours, the adrenaline will be out of their system and they will be hydrated. This is now a better picture of what their health condition is.

Check in with your breeder at the end of the day with pictures and an update on the condition of the chameleon. And, yes, good news is absolutely welcome and encouraged!

The universal chameleon sign of trouble

Eyes closed during the day is the sign that something is wrong.

Day two is an important day. An animal coming out of a shipping box has adrenaline running and can look better than it is. If something went wrong in transit, it could show itself the following day.

An animal sitting with its eyes closed in the daytime needs your attention, and needs communication with your breeder.

When it should be eating

We all want our chameleons to eat as soon as possible because that is a sign of health. And we are looking for every sign of health with a new chameleon! But Parson's Chameleons do things on their own time scale. If your chameleon has not eaten in the first few days it is something to note, but not something to panic about. If they are alert, not eating could still be a part of the settling process.

You are also getting used to their preferences as much as they are getting used to a stranger in their life. Remember that they already knew which humans had been around them and meant good things. Your profile is blank and they are filling in the information as to whether you are safe or not. This hesitation may distract them from eating a boring cricket, but it may be forgotten for a grasshopper or a silkworm. This is where you start to learn what foods are of more interest to them. Of course, asking the breeder what they liked is always a good idea.

If they are healthy, and not in brumation, eating will come back soon enough.

What normal actually looks like

Parson's Chameleons are slow. They grow slow, they move slow, they live slow.

If you have come from panther or veiled chameleons you are used to a high-energy animal, and you might read a Parson's stillness as something being wrong. It is not. It is just a different pace of life.

An alert Parson's with its eyes open is a Parson's that is probably fine.

The exception to the eye rule

Once your chameleon works out the pattern of when the lights go off, it may go to its sleeping spot early and put itself to bed ahead of the sunset. I have seen chameleons asleep an hour and a half before lights out.

That is normal. Chameleons are very good with patterns, and this one is a sign of anticipation of night rather than illness.

The exception applies only at the end of the day, and only if it is consistent. Eyes closed in the morning or the afternoon is still a problem.

Hand feeding can wait

I encourage hand feeding as a way for your chameleon to build that trust with you. This is a healthy relationship interaction and helps any apprehension for you as a stranger melt into excitement to see you because of what you might be bringing to eat.

But hand feeding is the result of trust built up, so don't rely on it immediately. Of course, some chameleons come out of the box ready to take on the world, but

others need time. Give yours time to get to know you. Work into feeding by hand slowly.

Settling into the schedule

Within a couple of days you will start to see your Parson's fall into the rhythm of your enclosure. You have been running the schedule since the day it arrived; what changes is that the animal begins to anticipate it.

That is the point at which you stop having a new arrival and start having a Parson's Chameleon living in your house.

ARRIVAL DAY AT A GLANCE

- | | |
|--|---|
| <p>1 Go to the hub
Take the morning off if that is what it takes.</p> | <p>2 Document
Photos and video of their arrival.</p> |
| <p>3 Report
Confirm arrival to the seller.</p> | <p>4 Water
Into an enclosure and misters on!</p> |
| <p>5 Offer food
But do not expect it to be taken.</p> | <p>6 Leave it alone
Let it settle in peace.</p> |

WARNING SIGN

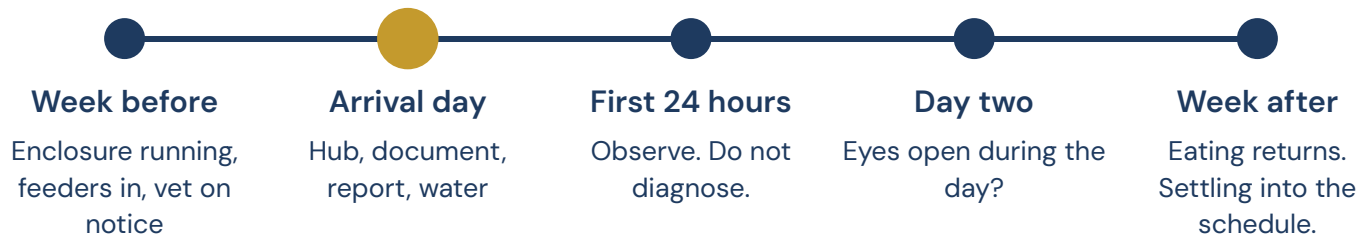
Eyes closed during the day

This is the universal chameleon sign of trouble. It needs your attention, and a message to your breeder.

The one exception: a consistent early bedtime at the end of the day, once your chameleon has learned when the lights go off.

THE TWO WEEKS AROUND ARRIVAL

From the Week Before to Settled In



BEFORE THE CHAMELEON SHIPS

- ☐ Enclosure set up and running for a week
- ☐ Feeders in a couple of days ahead, and gut loading
- ☐ Ship date agreed with your breeder, priority overnight
- ☐ Live arrival guarantee terms understood
- ☐ Vet on notice for a fecal check
- ☐ A zip-lock bag ready for the first poop



Document before anything else: photos and video, then a report to your breeder. It is normal for the chameleon to be out of sorts initially, but it should be alert with eyes open once it wakes up from the dark box.



Chapter 24

Feeders: Nutrition & Supplementation

We bring nutrition to our Parson's Chameleons in three ways: feeder variety, gut loading, and supplementation.

Feeder Variety

We cannot replicate the variety of insects they eat in the wild, or the varied nutrition that variety brings, but we do have an impressive range available to us in commercial feeders.

Good staple feeders are roaches (*Blaptica dubia* or *B. discoid*), large crickets such as the black cricket (*Gryllus bimaculatus*), and large grasshoppers, which are ideal. Grasshoppers are a particular favorite.

For variety, add superworms, silkworms, hornworms, praying mantises, stick insects, Japanese beetles, bees, and just about anything that moves and fits in their mouth. Each insect brings a different nutritional profile, which is the whole point of feeding more than one kind. Two cautions on the exotic end of that list. Some insects defend themselves — wasps sting, and a number of stick insect species spray or carry chemical defenses, so know what you are offering. Chameleons have done a great job of crunching through insect defenses, but know the risks. And anything wild-collected comes with whatever was sprayed where it was collected. I have yet to have a confirmed case of poisoning from pesticides, but I have no desire to test it with my Parson's Chameleon.

Sizing

Scale your feeders to your animal. The commonly cited rule is that a feeder should be no longer than the distance between the eye turrets, and that rule will keep you safe. To be sure, chameleons will take prey that will shock you. For a full-grown male Parson's Chameleon, birds are on the menu! But larger prey has risks. A larger insect can fight back, and an insect that fights back can injure your chameleon. Start with the eye-turret rule and you stay well within the safe zone. Care parameters exist to give a new keeper the safest possible start, and that is what the rule is for. You can increase the size of what you feed rather quickly and will get a feel for how much they can actually handle. Grow into the larger prey as you get a feel for your animal.

Vertebrate Feeders

New Parson's keepers commonly hear about keepers who feed pinkie mice, lizards, or small birds. The idea is to provide a burst of nutrition. There have been many experiments as to whether vertebrate prey helps with various life stages. What I have heard are anecdotal conclusions. I am not aware of any proven benefit. Parson's Chameleons live, grow, and thrive on an insect diet. But it is well worth continuing to experiment with the benefits of vertebrate prey.

Finding Feeders

Getting a real variety takes some sourcing. Specialty online feeder suppliers are the best route and will carry things difficult to find locally. A well-stocked reptile store is the other option, though you will need a very good one for the more exotic insects. Once you are past the initial cost of the enclosure and chameleon, one of the highest recurring costs will be your feeders and shipping. This is where many Parson's Chameleon keepers become insect breeders!

Gut Loading

Insects have to be fed to be nutritious as food. This is deceiving, because a starving cricket looks very much like a well-fed cricket to an untrained eye, while the difference to a growing chameleon is night and day. Every insect will need a diet specific to what they are and their body expects. But for common roaches (*Blattella germanica*) and crickets, commercial feeds are available.

Give them moisture separately. Carrots and sweet potatoes work well. Commercial water crystals or insect water stations are other common options.

Feed your feeders for 24 hours before they go to your chameleon, though 48 hours is better. You have no idea what your feeders were fed before they came to you. If you have not raised up the feeders yourself, take feeding the newcomers seriously. It is easy to just assume those roaches have nutritional value, but your Parson's is counting on you to make sure what is inside that roach will help them grow strong. Don't feed your chameleon an empty shell.

Supplementation

Supplementation is an important topic because Parson's Chameleons are sensitive to our powders. Where a Panther Chameleon can take routine multivitamin supplementation, a Parson's Chameleon might quickly develop edema on the same schedule.

Edema is fluid accumulating in the tissue. The external sign is a swelling, usually a sac around the neck. In Parson's it turns up alongside our supplement powders often enough that experienced keepers treat the two as linked. Something about this species makes it react badly to them. Thus we rely heavily on gut loading and proper UVB or unfiltered sunlight. Note that different individuals respond to supplementation differently. But overall, the less the supplementation the better they seem to do. Keepers in both the US and Europe report using Sticky Tongue Farms Miner-All O successfully. This supplement has no fat-soluble vitamins. So fat-soluble vitamins are the suspected trigger of edema.

Supplementation Schedule

The schedule I am recommending is minimal. I am going to place the bulk of the nutritional responsibility on robust feeding of the feeder insects and adequate UVB lighting. A UV index of three in the basking area, with a branch positioned so the chameleon can actually get under the lamp, is what makes it reasonable to keep D3 out of the weekly calcium powder.

Once a week: calcium without D3.

Use a calcium product without vitamin D3 or preformed vitamin A. Sticky Tongue Farms Miner-All O and Arcadia EarthPro-A both work, and so does plain calcium. Any of the available calciums for reptile keepers will do.

Three times a year: a multivitamin with low preformed vitamin A.

Dust one feeding, every other month of the active season. Because a brumating Parson's is not eating, that works out to three dustings in a typical year, and perhaps four if your animal has a short brumation. For this I want a supplement with low preformed vitamin A. Repashy Calcium Plus LoD or Reptivite with D3 are

good candidates. Their preformed vitamin A is around 80k to 100k IU/lb. Both also contain some vitamin D3, and that is fine at this frequency. Keeping D3 out of the powder is about the weekly calcium, not a dusting every other month. Like any multivitamin, these can be overdosed if used too often, which is why the schedule is every other month and no more.

During brumation there is no feeding, so there is no supplementation. The schedule picks back up when the animal starts eating again.

How to Dust

Put a small amount of powder in a cup with the insects and mix it around. The coating should be light enough that you can still see the insect's color through it. Avoid a bug snowball.

Behind the Scenes Insight

Over the years there has been a wide range of supplementation strategies that have worked to various degrees. Taking on the supplementation schedule from your breeder is a great approach. Just keep in mind that Parson's Chameleon breeders tend to be among the most dedicated of chameleon keepers. Thus they often breed their own feeders and are dedicated to what the feeders eat. They have UVB meters and check to maintain proper levels. Nutrition is a multifaceted husbandry parameter and you need to take on these aspects as well to get the same result from a supplementation schedule that your breeder has gotten.

Signs of Trouble

If you see swelling, particularly around the neck, discontinue all multivitamin supplementation immediately. That is edema, and it is the sign that your supplementation has created an imbalance in your particular chameleon. This doesn't mean that you did the supplementation schedule incorrectly. It means that your chameleon has a different sensitivity and it is time for you to adjust. Calcium can continue on the once-a-week schedule. Edema should resolve once the multivitamin is stopped, but it takes many months to go away completely. If it does not show signs of going down after a couple of months without the multivitamin (or, worse, it gets more pronounced), a vet visit might be in order.

WARNING SIGN

Swelling around the neck

That is edema. Discontinue all multivitamin supplementation immediately. Calcium without D3 can continue once a week.

SUPPLEMENTATION: THE YEAR AT A GLANCE



Shown for an animal that brumates November through April. The schedule picks back up when it starts eating again.

HOW TO DUST



A light coating

FEEDER VARIETY

Staples, and Other Things!



Roaches

STAPLE



Black cricket

STAPLE



Large grasshoppers

STAPLE



Japanese Fruit Beetle

TREAT



Superworms

VARIETY



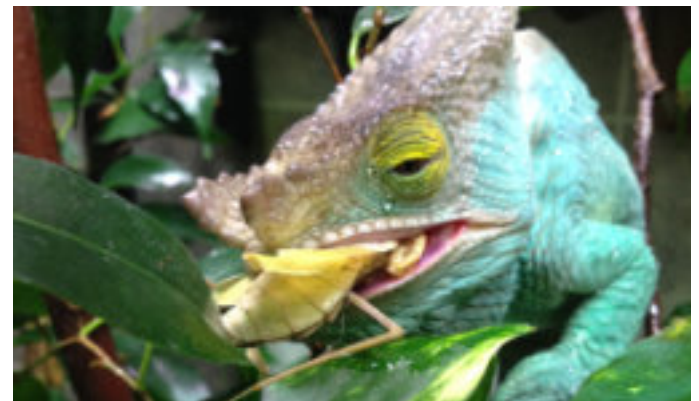
Silkworms

VARIETY



Hornworms

VARIETY



Praying mantises

VARIETY

Also for variety: stick insects, Japanese beetles, bees, and just about anything that moves and fits!



Chapter 25

Feeding Methods

Parson's Chameleons are insectivores, and they need those insects alive and moving. Which means that before anything else, you are going to get used to having live bugs around the house!

I know that is intimidating at the start. But what usually happens is that the person who was squeamish about crickets is, six to twelve months later, breeding two species of roaches and telling you about it at length. It is a whole new world with untapped fascination.

The specific challenge with Parson's Chameleons is the size of feeders. A full-grown Parson's takes the largest crickets generally available and would happily take more. Parson's keepers put real effort into sourcing food big enough. This chapter is about how the food gets from your hand into the animal.

Contain Your Feeders

There are three main ways to feed a Parson's: by hand, out of a feeder run cup, and free release. Most keepers use a combination of by hand and feeder run cup. Hand feeding and the cup have one thing in common: the feeder insect never gets loose in the enclosure.

That is deliberate, and there are three reasons for it.

Feeders disappear. A Parson's enclosure is large and well planted, which gives an insect a great many places to be. When you are paying a dollar apiece for grasshoppers, you want to know that the grasshopper got eaten.

Many of our feeders are good hidiers. Superworms, crickets, dubias — release them into the enclosure and, after the initial scurrying around, they find somewhere dark to hide. Under a pot, behind a plant, somewhere the chameleon cannot reach them. You have not fed your chameleon. You have stocked your enclosure with insects. Which can be fun, but pet roaches are outside the scope of this text.

It breaks the parasite cycle. Internal parasites put their eggs out in the poop, and in our enclosures the most common route back into the chameleon is a feeder insect that walked through it and then got eaten. Keep the feeders off the floor and you close that route.

Let's look at each one.

Hand Feeding

Because of their size, adult Parson's take prey large enough that it is comfortable to hold in your fingers and offer. Some people extend this by using tongs. This can help with shy chameleons who are intimidated by your hand being so close.

As a feeding method it does a few things a cup cannot. You know for certain the animal ate, and you know exactly what and how much. You can feed small amounts daily rather than a pile every other day. And it puts you in front of the animal regularly, which connects you to food and good things in the chameleon's mind.

Whether using fingers or tongs you have to be careful not to hold so tightly that the chameleon's tongue is not able to pull back the feeder insect. The tongue is not designed to be in a tug-of-war. It is meant to hit the insect and be reeled back in. Anything that interferes with this is a danger to the tongue. The key is to just hold on loosely, but don't let go. If you cling too tightly you are going to lose control of being able to let go immediately when the tongue strikes. If you use tongs make sure there are no sharp points that could damage a tongue. Bamboo or plastic tongs are good options.

The Feeder Run Cup

A feeder run cup is a cup with a solid back and a climbing surface, so the insects can move around and walk up where the chameleon can see them. Contained, but active. The movement is what gets the animal's attention.

Put it where it is easy for you to reach and easy for the chameleon to reach.

Mine goes on a vertical structural branch right beside the door. I can crack the door six inches (15 cm), lift the cup out, clean it, refill it, and put it back without reaching into the enclosure or opening the door all the way.

Make sure perching branches run to that vertical, so a hungry chameleon can walk over on a convenient route and find the cup sitting directly in front of it.

And put it up in the foliage where the animal actually lives. A cup down in the open is a cup the chameleon has to leave its comfortable space to visit.

Free Release

Releasing the feeder insects on the side of the cage to crawl up is an option if you have a screen side. The disadvantage of this method is that you lose control over the feeder and if the chameleon doesn't tag it quickly the feeder can find a place to hide. I bring this technique up only because it can be the way to get a shy eater to finally eat. This is a common challenge with wild-caught Parson's in acclimation. But a Parson's in acclimation has the greatest parasite risk and free-release feeders are what the parasites are looking for to get back into your chameleon. So do free-release feeding deliberately and with supervision.

Building Trust

My preferred method is to hand-feed the first insect — the first dubia, the first cricket, the first silkworm — and then put the rest in the feeder run cup and let them eat. You get the relationship strengthened at every meal and the animal still gets fed properly.

How Much, and How Often

Juveniles and sub-adults are fed every day and get as much as they will eat. This runs for about the first two or three years of life, until they reach adult size.

Adults are fed two to five appropriately sized feeder insects every other day.

When discussing how much a chameleon should eat it becomes difficult to come up with a universal measure considering the vast diversity of feeders and nutrition. But you can approximate what you are feeding to the equivalent of two large dubia roaches every other day.

It is a good idea to monitor how much your adult is eating and keep it to these amounts. I did have one Parson's female that I fed a little too generously because I thought she was gravid. It turns out she was not gravid and she was just playing me. Beware those cute faces...

The special condition: Gravid females. Females should be kept lean throughout their life and going into the breeding season. This ensures that their body is strong and that she does not overproduce eggs. Once she has a successful mating, though, her body is now creating the next generation and you can feed her as much as she wants to eat. The thinking is that the number of eggs has

already been set by the time she mates, so the extra nutrition goes into those eggs rather than into more of them. There is no definitive proof of this that I am aware of, but it is the approach we have settled on to try to avoid overproduction. Once she has laid eggs, continue feeding as much as she wants for a week or two and then pull back to standard adult feeding.

How to tell a healthy weight. Parson's have a stocky build, so body condition is hard to read off the body. But you can start to notice them becoming more and more stocky. Unfortunately, the casque method, where the casque will bulge out in panthers and veileds, does not work as a reliable indicator in Parson's Chameleons. There is no empirical way to know when a Parson's Chameleon goes from healthy to overweight and this determination relies on your judgment. When you see Parson's Chameleon images online, learn what a healthy chameleon looks like. That is the best way to train your eye to recognize when yours looks different.

Feeding Through Brumation

When brumation arrives, feeding can drop to near zero on its own.

What it means for you is simple. Keep offering one feeder occasionally (once every two weeks) and expect to be refused. Do not force food on a brumating animal. It is fine that they do not eat for months, and they will make up for it on the other side.

HOW MUCH, AND HOW OFTEN

Juveniles and sub-adults	Every day, as much as they will eat
Adults	Two to five feeders every other day or just one big feeder a day
Females	Kept lean on adult diet, but switched to as much as they will eat once mated. Then back again after laying eggs.
Brumation	Offer occasionally and expect to be refused

CONTAIN YOUR FEEDERS

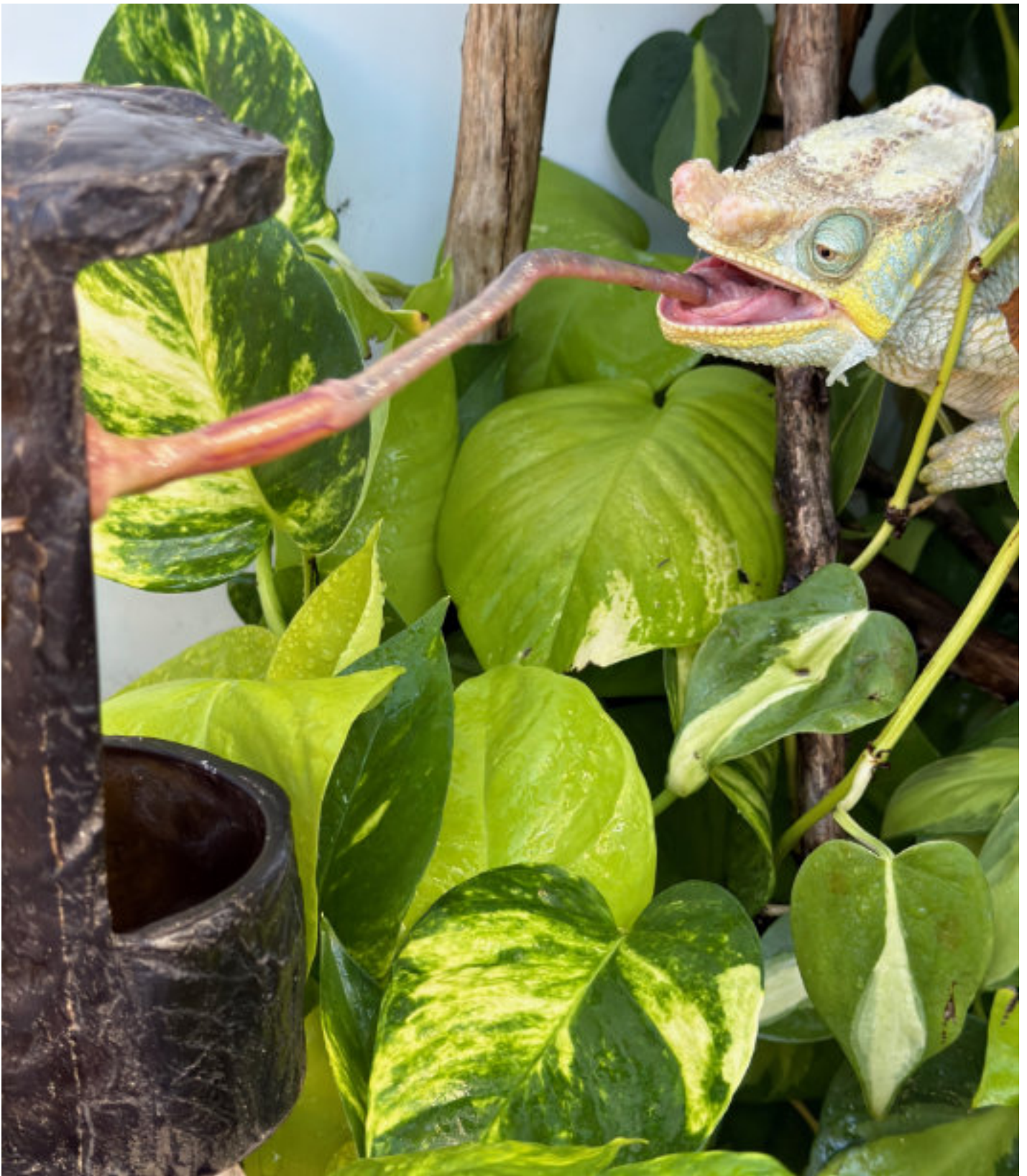
Three Reasons

Feeders disappear A large, planted enclosure gives an insect a great many places to be.	Good hiders Superworms, crickets, and dubias find the soil and stay there.	Breaks the parasite cycle Nothing walks through the poop on its way to the chameleon.
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THREE WAYS TO FEED

Hand feeding	You know it ate, and exactly what and how much. Builds trust.
Feeder run cup	Contained and easy to clean. Up in the foliage, where the animal lives.
Free release	Screen sides only. You lose track of what was eaten. But it can convince a shy chameleon to eat.

Most keepers use a combination of hand feeding and the feeder run cup.



The feeder run cup: easy for you to reach, easy for the chameleon to reach, and up in the foliage where it lives. This is the Lizard-alley Cricket Feeder run cup by Naymar's Marsha Ipsen.



Hand feeding: hold loosely enough that the tongue can pull the insect back.



Chapter 26

Handling & Interacting

This chapter has two jobs. The first is to discuss required handling such as moving your Parson's between enclosures, going to the vet, and doing physical inspections. The second is dealing with our human nature. We touch what we love and it is common for us to have secret visions of a shoulder demon that rides around with us and whispers wisdom into our ear. This is where I become the villain as I close that door. But I will attempt to redeem myself by showing how you can develop a trust-based relationship. Which is more fulfilling — bending a lizard to our will or learning to speak its language and communing with it on its terms?

The Bottom Line Right Up Front

Chameleons do not like to be held. Parson's Chameleons are no different.

Although, to be honest, you probably will not like holding them either. Those claws are designed to anchor them to a tree branch during a Madagascar cyclone. Anybody who holds Parson's Chameleons walks away with literal holes in their skin. They are not trying to hurt you. That is just how a chameleon holds onto a branch, and your arm is not as strong as a branch. It can be eye-watering, and they don't let go easily once they have settled. Wait until you get some of those back paws wrapped around your finger in a death grip.

It is an experience you remember.

Parson's Chameleons are display animals, and they are amazing display animals. They are not holding animals.

Moving a Parson's

When you do have to move one, the best way to do it is with a stick.

Get a good stick that you can hold and that is the diameter where they can just reach their foot all around the branch. Put the branch under the chameleon right in front of their nose, and slowly push them onto it. You can help by guiding their feet onto the stick. You are herding, not grabbing. They are likely to resist moving anywhere and, if you are really annoying, you might get an open-mouth gape and perhaps even a lunge at your hand. Continue to be gentle in coaxing the chameleon onto the stick, but be mindful of the biting end. They have powerful jaws.

The Tail

A Parson's tail is an entity unto itself. It is instinct for the tail to grab onto anything and everything. They have not evolved any understanding of getting onto a stick that somebody is holding, so as you bring them out, that tail is going to wrap around every branch it passes. If it wraps around a branch and you keep pulling, you can seriously injure it. This is in their DNA, so don't expect it to change.

So use both hands. One hand holds the stick with all four feet on it. The other hand stays on the tail, making sure it is not wrapping around anything on the way out.

That is how you move a Parson's between enclosures, out to the car for a vet trip, or out for photographs or a physical inspection.

Getting One Off You

At some point one is going to be dug into your hand and not letting go. They are anchoring themselves, which is what they do, and it can bring tears to your eyes.

You cannot jerk your hand away. Especially not when they are half on a branch and half on your finger, because you will damage the animal. Your finger is being punctured and you have to sit there and take it.

What you do is give them somewhere to go. Put a branch in your other hand and bring it to them, offer the support, and encourage them onto it. They have no desire to crush your finger. They have no desire to be on your finger at all. Nudge them toward a better option.

A chameleon will often just freeze — half on the branch, half on you — and now nobody is moving and it is awkward. You can encourage them along by working at the toes on your finger, putting gentle pressure to pry them loose so they shift their weight to the branch you are holding.

Gently. You cannot force any part of this or you will break their foot.

I know how hard that is. I have had blood coming out of my fingers. But we are responsible for taking care of these animals. That is the role we took on, and we need to take it seriously.

This is a large part of why you do not hold your Parson's Chameleon unless you have to. It is not a fun experience for either of you!

Transporting Your Parson's

When you have to transport your chameleon you want to do it in a way that eliminates as many avenues for injury as possible. An easy way to transport them is in a large plastic sweater box with a towel on the bottom for them to grab onto. I often add a strong perching branch by drilling holes in either end, running a stick through the box and hot-gluing the ends in place. A container with opaque sides can calm your chameleon as it is transported in darkness. Make sure there is adequate ventilation. You can drill holes in the sides for ventilation. Make sure you are not sealing your chameleon in a box without air holes.

A critical issue with driving with reptiles is the greenhouse effect. If you have a chameleon in a travel container and the sun shines on it, the inside of that container will heat up quickly and, even if the air conditioner is keeping you comfortable, the transport container could overheat your chameleon. To avoid this, make sure the travel enclosure is never in direct sunlight and never left in the car when you stop for a coffee or bathroom break. Bring the travel container with you if you have to stop.

Allow me to be frank — you can very easily kill your chameleon by leaving them in a car. When you are on your way to the vet. When you are on your way home from the reptile show. When you are on your way home from picking up your chameleon from the shipping hub. The danger is greatest when you are not thinking it is a problem. Is the temperature cool outside? Are you going in only for a couple of minutes? Do not make exceptions. Never leave your chameleon in the car if the sun can hit the car at all.

Escapes

We aim to create enclosure environments that are so comfortable for your Parson's that you could accidentally leave the cage door open and your Parson's would have no interest in exploring the outside. But there comes a time when you forget to latch the door and your Parson's decides to check out the outside. With outdoor keeping this is much more of a concern than indoors, unless you have pet dogs and/or cats that would attack your chameleon. If your Parson's gets out,

they often (but not always) will go high. Start by looking on top of the curtain rods. Bring them down the same way you would move them anywhere else — a stick, all four feet, and a hand on the tail.

How to Build a Relationship on Parson's Chameleon Terms

We are human beings and we want to interact with this amazing creature. We can do that. Let's just do it on their terms. The absolute best way to interact with a Parson's Chameleon is to hand-feed them.

They do recognize human beings. Your chameleon will come to recognize you and you can easily make it so they associate your presence with getting a treat. It isn't long before they will get excited when they see you come into the room. They will sit there looking for your hand. It is a lot of fun.

And there is husbandry value in it beyond the fun. A chameleon that recognizes you and trusts you is not being stressed every time you show up. When you have to get into the enclosure to do something, it becomes an inconvenience rather than a threat — more annoyance than fear. That is a real reduction in the stress load on the animal, and it is easy to earn. Just make sure that good things come with your presence.

Starting Out

To start building your relationship, get a special feeder — a roach, a black cricket, a silkworm, something worth their attention. Hold it in your fingers and offer it.

Then wait. Leave your hand in there with the insect in your fingers for a couple of minutes. If they are not going to react, take it out and come back tomorrow.

Be patient, and do not take it personally when they ignore you or act scared of you. We are working against millions of years of evolution telling them that big mammals are not things to hang out with. We are fighting everything in their DNA.

Their brain can override that, and it eventually does. They will get to know you, they will get comfortable around you, and they will come to trust you. But it will happen on their timeline and not on ours.

Your Eyes

There are some things you can do to help it along.

They notice your eyes. They know when you are looking at them, and they do not trust it, because that is what a predator does.

So put the feeder insect between you and the chameleon, with your eyes behind it. Now they do not have to keep one eye on the insect and one eye on you. Both eyes go on the insect, and you are still in view, so you are not sneaking up on them.

If they are still nervous, close your eyes, or look down, or look away. They know when you have looked away, and they feel much better about snagging something out of your fingers when you have.

Also, I know you want to share this on social media. But, they HATE cameras. They hate your phone. I don't know why they distrust camera phones so much. Whatever is going on, you trying to film them while you feed them will set your progress back!

The Foot in the Door

Once they take that first insect from your fingers, once they work out that this is good stuff, you are in.

If nothing bad ever happens when you come in and offer food — if only good things happen — they start to get excited. They stop caring whether you are looking at them. They stop caring where you are standing.

My Parson's Chameleon, Blue, is at the point now where I walk up to the front of his enclosure and he is just looking for my hand. He does not care where my eyes are, he does not care where my body is, he does not care about anything except what is in my hand.

He has tamed down. And he still does not like to be held. He is nervous about it and uncomfortable with it, and that is fine. Do not try to overcome that part of chameleon nature — it is not the low-hanging fruit. The low-hanging fruit is hand feeding, and it gets you the thing you actually wanted: a pet chameleon that is excited to see you and excited for what you bring.

Kids

Children may not understand that handling a Parson's means taking the pain, and holding still while it happens. So be very careful about putting one in their hands.

They can help you take care of the animal. They can look at it all they want. They can especially join in the hand feeding. I think it is a great idea to have your kids involved with the care of this amazing animal. Just do not make any critical care task a child's responsibility.

WARNING SIGN

Never leave a chameleon in a car

Sun on a travel container turns it into a greenhouse, even with the air conditioner keeping you comfortable. On the way to the vet, on the way home, any time you stop: bring the container with you.

MOVING A PARSON'S A Stick, All Four Feet, and a Hand on the Tail



- 1 Slowly entice them onto your carrying stick. You are herding, not grabbing.



- 2 Use both hands. The tail grabs anything it can reach on the way out.

GETTING ONE OFF YOU



Give them somewhere to go. Never jerk your hand away. And, yes, my thumb and finger both had punctures on them.

YOUR EYES



Put the insect between you, with your eyes behind it. If they are still nervous, look away.



Chapter 27

Quarantine & Acclimation

When your chameleon first comes home you start both quarantine and acclimation.

Quarantine is about keeping problems out — finding what came in with the animal before it becomes your problem or your collection's problem. You are isolating your new chameleon and figuring out if anything is coming with it that may be dangerous to any of your other chameleons. If you do not have any other chameleons, it is the time period where you are actively trying to uncover health issues.

Acclimation is about getting the animal onto your calendar and into your conditions. It runs on the animal's schedule, and it could take a couple of years.

Quarantine

Any new Parson's Chameleon, captive-hatched or wild-caught, should go through a quarantine period before you consider it established. The purpose is to identify parasites or disease while you can still get ahead of them. Go through the quarantine period before you add the best plants to your cage or a soil floor. Consider everything temporary. If you find something like coccidia then you will, most likely, be throwing everything out by the end of the quarantine period.

The setup. For chameleon keepers, a quarantine enclosure looks very much like the permanent one. The only real difference is that you would not run a soil floor during quarantine — you want droppings on a surface you can remove them from, not disappearing into a substrate.

Set up your quarantine cage like you would a normal cage. Set it up as if it were permanent, but leave the bioactive floor for later. If you keep other reptiles, the new animal needs its enclosure in its own space, away from them, with no shared equipment that has not been disinfected. I recommend a separate room and to care for your quarantined chameleon at a different time of day than your established crew to minimize the chance of contamination.

For the cage itself, a bare floor allows you to retrieve poop as cleanly as possible for the parasite checks. Ideally, the bare floor is actually a screen floor. This prevents water from pooling around the poop and spreading the parasites. It also

prevents water from dripping from the potted plants and contaminating the poop with soil-based, non-parasitic nematodes that can confuse the fecal analysis.

The cage should be set up so no branch is directly over another. We want to make sure, no matter where the chameleon is, their poop goes to the bottom of the cage without hitting anything. You will need to have plants that give your Parson's a hiding spot. Use the cheapest pothos plants for this with the intention that you will probably be throwing them out sometime in the quarantine process.

Observe daily. This period is where you establish what normal looks like for this particular animal — appetite, drinking, activity, droppings. You cannot recognize a change from baseline until you have a baseline.

Fecal checks. Collect samples early and have them looked at. A reptile-experienced veterinarian is ideal, but you do not need a reptile specialist to perform a fecal analysis for parasites. Many practices send fecals to a lab. Call ahead and ask whether they will. The point is to find out what parasites are present before they become a heavy load. Collect each sample the same way you collected the first one. You usually do not need an appointment to drop off a fecal sample, but you will need an appointment to get any medicines necessary.

Break the parasite transmission cycle. The most common parasites in captivity, and the ones we are most concerned about, are the direct life cycle parasites. Direct life cycle means the eggs or oocysts passed in the poop can infect the next chameleon directly, with no other host needed. In our enclosures, the usual route back in is a feeder insect that walked through poop. By understanding their life cycle we can adjust our husbandry to try to break it in three places.

1. Remove droppings immediately. (eliminate the infectious material)
2. Hand-feed or use a feeder run cup, so no feeder insect ever contacts the enclosure floor. (break the path back to the host)
3. If parasites are found, treat under veterinary guidance to clear the reproducing adults in the gut. (eliminate the adults inside creating infectious material)

How long. For a captive-hatched animal, 60 to 90 days and three negative fecal checks is the minimum. The three samples do not need to be spaced out; consecutive droppings are fine. For a wild-caught animal, many experienced

keepers want a full year of observation before they will call it established.

When quarantine is over. You may have to throw away the plants. If any fecal material made it into the plant soil there is no way to ever be sure you have removed it all. You will also want to thoroughly disinfect the cage with a combination of a disinfectant (such as Rescue Veterinary Cleaner), physical scrubbing, and direct sunlight. Build up the cage with new plants and branches. You can now consider adding a soil floor if you desire.

Acclimation

A Parson's Chameleon is attuned to the seasonal variations in the wild. This presents a challenge when we bring them to our seasons. This section assumes that any captive-hatched individual is on your annual schedule and I will focus on acclimating a wild-caught Parson's Chameleon. This book talks about acclimation to the Northern Hemisphere. Those in the Southern Hemisphere will have to deal with the environmental differences, but not the switch of seasons.

The seasons in Madagascar are reversed from ours in the Northern Hemisphere. Their warm, wet season runs roughly November through April, while we are in fall and winter. Their cooler, drier season runs roughly May through October, during our spring and summer. An animal that arrives here is running on a calendar that no longer matches the world outside your window, and we have to help that transition. The good news is that this is not that hard to do. It does take work and patience, but it is straightforward.

Wild-Caught Animals

Timing matters before you even get the animal. A wild-caught Parson's imported in November or December arrives at the start of what its body understands to be summer, which is the ideal time to receive one. Animals that come in February or March arrive at the end of their summer — they may already have bred, a female may already be gravid, and they were collected heading into the dry season, which means they often arrive not so fresh.

If you get an imported Parson's Chameleon during your Northern Hemisphere winter you are getting a chameleon that is in the middle of its warm, wet, and active time of year. Continue these conditions and then have it postpone its

expected brumation for that year as you go into summer. When temperatures start to dip as your winter comes, this is the time to allow your Parson's to go into the 50s°F (10–15°C) at night and 60s°F (16–21°C) during the day. Your Parson's should go into some level of a brumation state and then should be acclimated to your schedule the next year.

If your chameleon was imported during our summer, which is their brumation season, their internal clock may be very confused. I would let them come out of brumation and then replicate the wet, warm season for the duration of my summer and then let them go back into brumation when my winter comes.

Be cautious about brumating a wild-caught animal outdoors its first winter. For your chameleon's first brumation in its new home I would avoid letting it get below 50°F (10°C) at night. Parson's Chameleons can easily handle that, just not when it is sprung on them as a surprise. Keep it indoors at moderate temperatures, no extremes, that first year. The following winter you can let them experience temperatures lower than the "ideal". Give them enough cold to trigger brumation, but do not challenge them.

And it depends on condition, not on the calendar. An animal that is eating well, hydrated, and carrying weight can handle cold. An animal that is thin or off food will have less buffer, and you need to be careful with brumation.

Captive-Hatched Animals

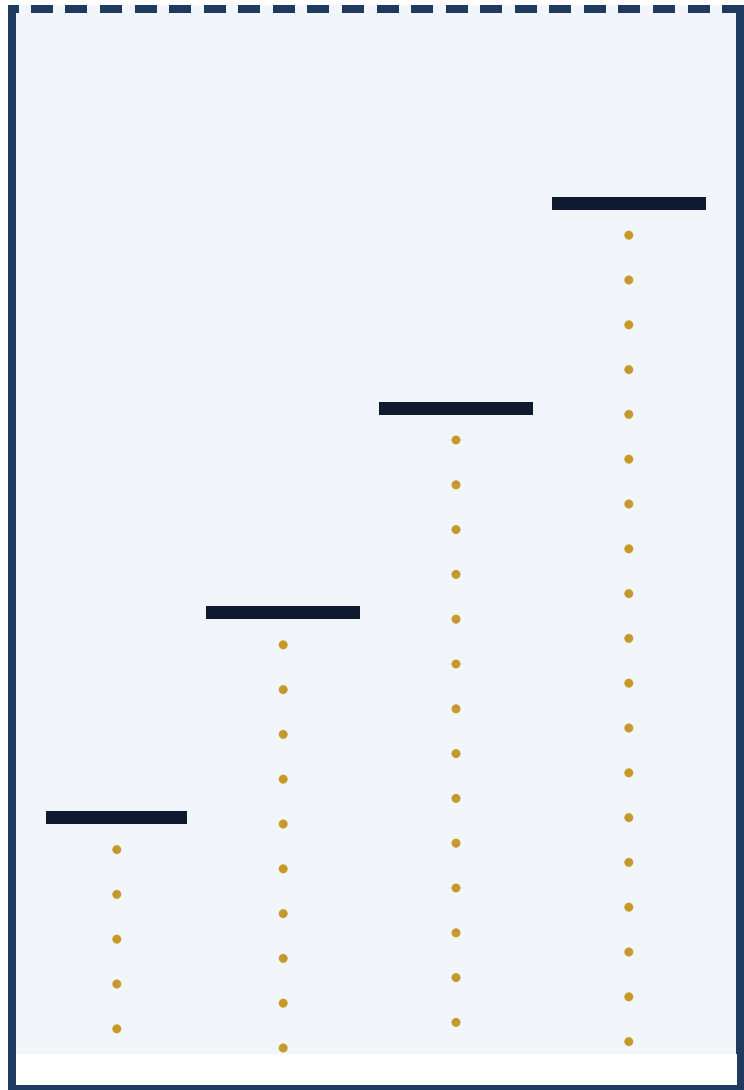
A captive-hatched Parson's was raised in your hemisphere and is already on your calendar, which removes the hardest part of this. Quarantine still applies. The hemisphere flip does not.

You do not have to brumate your Parson's its first winter. You can let it grow and put some size on first. And I would not put an animal under a couple of hundred grams outdoors to face real cold, whatever its age.

THE QUARANTINE ENCLOSURE

No Branch Directly Over Another**Staggered branches**

Droppings fall straight to the floor without hitting anything on the way down.

**A bare floor**

No soil during quarantine. You want droppings where you can remove them. Ideally, you have a screen floor so there is no pooling of water or contamination from water dripping from pots.

BREAK THE PARASITE CYCLE

1**No floor contact**

Hand-feed or use a feeder run cup.

2**Remove droppings**

Immediately.

3**Treat if found**

Under veterinary guidance.



Chapter 28

Medical Considerations

Parson's Chameleons are generally robust animals. They do not have species-specific medical catastrophes beyond what any well-kept chameleon faces. But their need for ample hydration and their more sedentary lifestyle make foot health a greater concern.

Technically they can develop any condition any other chameleon can. What follows are the most common ones that we see in a Parson's, covered in enough detail to act on. This is a reference only. Consult a qualified veterinarian for definitive care and advice.

Find Your Veterinarian Before You Need One

Reptile-experienced veterinarians are, unfortunately, rare. So it is wise to search for one long before you actually need one. An initial wellness visit lets you interview your potential vet as much as it creates a baseline of care for your chameleon. Searching during a crisis is how you end up with no good options at two in the afternoon on a Sunday.

Where to look. ARAV.org (the Association of Reptile and Amphibian Veterinarians) has a find-a-vet directory of member veterinarians. You can also find the keepers in your area on social media and ask who they use. If that comes up empty, do a local search and start calling vet offices. Ask whether they see reptiles — and if they do not, ask where they would send you. A vet who does not treat chameleons very often knows who does.

What if there are none? Relatively few veterinarians have deep chameleon, or even reptile, experience. That number is growing, which is good news, but depending on where you live you may not have an experienced choice.

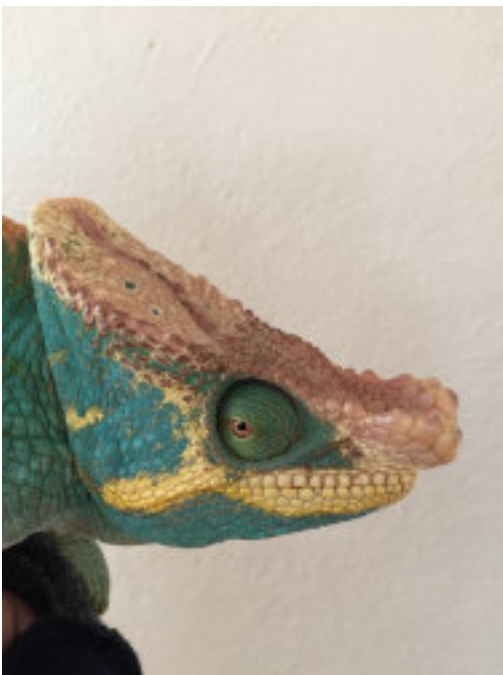
There are ways of surviving a chameleon vet drought. A highly experienced chameleon vet is what you want when you are troubleshooting — when something is wrong and nobody knows why. But it does not take a specialized vet to get antibiotics for a respiratory infection, and you do not need them to run a fecal, because most practices send those to a lab anyway. There are published formularies covering what medication treats what, at what dose per weight. A dog and cat vet with access to those tables can do a great deal for you, if they are willing. Very experienced chameleon veterinarians are also available for

consultations with your vet. So, if you find a vet that is willing to learn, you have an option. Unfortunately, laws in some states restrict veterinarians from consulting with the end client, so vet-to-vet consultation is the option available.

What that arrangement requires is that you know chameleons. You are the one who has to recognize that something is wrong, and you are the one who has to fix the husbandry that caused it. The vet supplies the medication. You supply everything else. This is where being part of a strong chameleon community is beneficial. Although we are not able to give veterinary advice, we can sure help point you in the right direction as far as what the condition may be!

THE UNIVERSAL SIGNS

Sunken Eyes



Sunken eyes are a universal signal, in any chameleon. A healthy chameleon's eyes fill their turrets. When the eyes sink in, something is taking a toll on the animal, whether dehydration, exhaustion, or illness. It is not a diagnosis on its own. It tells you to look for the cause, and to look now.

THE UNIVERSAL SIGNS

Eyes Closed During the Day**WARNING SIGN****A red alert**

Outside of two exceptions, a learned early bedtime and cold in the 40s°F (4–9°C), closed eyes during the day mean you go looking for the real problem immediately.

A chameleon with closed eyes during the day is a red alert. Outside of the two exceptions below, a chameleon closes its eyes only when the pain inside is worse than the fear of being eaten. It is not a disease itself. It is a symptom of internal distress, and it means you go looking for the real problem immediately.

The first exception is bedtime. Once a chameleon has learned your light schedule, it may go to its sleeping spot and put itself to sleep before the lights go out — sometimes well over an hour early. That is not a health issue. It is preparing for sleep. It applies only at the end of the day and only when it is consistent. Eyes closed in the morning or the afternoon is still a problem.

The second exception is cold. When temperatures drop into the 40s°F (4–9°C) — something you will rarely see indoors, but can see outdoors and during brumation — a chameleon may close its eyes and take a while to come out of it once it warms up. But eyes closed during the day, even from cold, means you are at the edge of the tolerance zone. Experienced keepers do work there. Get the experience before you let it happen.

SUPPLEMENTATION AND LIGHT

Edema

YOU SEE

Excess fluid, usually around the neck.

WHAT TO DO

Stop all multivitamin supplementation.
Calcium can continue once a week.

These two conditions are the opposite ends of the same balancing act.

Edema. Excess fluid in the tissues. In chameleons we usually first notice this around the neck, in the gular area.

Parson's get this when something in the body goes out of balance. We have noticed a connection between edema and the use of supplementation powders. A normal supplementation routine for a panther chameleon can quickly cause a reaction in a Parson's.

It comes on fast. A couple of weeks of supplementation is enough to start seeing it. But, it goes away slowly. When you stop the multivitamin it will come down over many months – nowhere near as quickly as it arrived.

What to do about edema. The current response to edema is to stop the multivitamin, be obsessive about gut loading feeders, verify UVB is working, and then wait the months it takes for the fluids to subside. With our current understanding, there is no medication to give. It just takes time and patience.



Edema is excess fluids in the tissues, usually noticed in chameleons around the gular region .

Metabolic Bone Disease (MBD)

WHAT TO DO

Your vet can stabilize with injections. Then check your UVB and D3.

YOU SEE

Bowed legs, a malformed jaw, a tongue that misses, ribs that break easily.

Metabolic bone disease. MBD is rare in Parson's. This is probably due to Parson's keepers historically being more experienced. But they are as susceptible as any chameleon.

MBD is a condition in which there isn't enough calcium in the body to maintain normal function. Calcium is drawn out of the bones to support critical organ function leaving bones weak and unable to do their own job.

A common first sign that we detect visually is the bowing of the legs or difficulty climbing. Although the entire body is affected, the legs are carrying the chameleon's weight and begin to bow. But MBD can also cause malformation in the jaw and permanently affect your chameleon's ability to aim and shoot its tongue. In addition, the ribs weaken and break easily. Then it compounds. Weak bones bow, break, heal, and break again, and you end up with disfigured limbs. Calcium will continue to be drawn out of the bone to support other, more life-critical functions. Without calcium, and the vitamin D3 that allows its absorption, the body will eventually stop functioning and die.

This downward spiral can be halted by getting the proper D3 and calcium into the animal. Though, halting does not mean reversal. The bones can regain strength, but disfigurement that has already happened is permanent.

What to do about MBD. The first diagnosis of MBD is often you posting pictures to social media and someone pointing out the subtle signs of trouble. If you notice something may be off, get an opinion from someone more experienced or your veterinarian. Upon the confirmation that your chameleon is experiencing MBD, your veterinarian will be able to give emergency injections to help stabilize your chameleon and a treatment plan for proper levels. The next part is you correcting husbandry. The problem may not be lack of calcium, but lack of vitamin D3, which the body needs to absorb calcium. That is why a non-functioning UVB bulb is the prime suspect. Do this all in partnership with your veterinarian.

INFECTIONS

Respiratory Infection

YOU SEE

Nose in the air, gaping, then eyes sinking in and closing. Mucus or bubbling.

WHAT TO DO

Treatment from a veterinarian.

Respiratory infection. There are many things that can take hold in the lungs to cause a respiratory infection. It could be bacteria, fungus, viral, or parasitic.

The symptoms include your chameleon putting its nose in the air (which straightens the trachea), gaping (opening its mouth for more air), and, finally, eyes sinking in and closing. You may also see mucus or bubbling at the nostrils or mouth, or hear a popping or clicking sound when it breathes, especially alongside the nose-up posture or gaping. Your chameleon is trying to get more air into its lungs. But it is a losing effort. The problem is not how much air is sucked in — it is that the effective lung surface is shrinking due to the infection.

Your chameleon is breathing in bacteria, fungus spores, and viruses with every breath. It is the strong immune system which keeps them from establishing themselves in the lungs. It is when the immune system is compromised enough that it cannot clear them that an infection occurs.

What to do about a respiratory infection.

Although a respiratory infection is often assumed to be bacterial, accurate diagnosis is critical because antibiotics will not, necessarily, be effective against a virus, fungus, or parasite. If the treatment plan is not showing results do not delay notifying your veterinarian. The treatment plan is complete only when it includes a reduction of the physical or psychological stresses that caused the immune system to weaken in the first place. If the husbandry that opened the door is still in place, the infection comes back. Whatever condition is causing stress must be eliminated. This could be cohabitation, temperatures that are too hot, or any other husbandry parameter extreme.

RESPIRATORY INFECTION



Gaping: the mouth held open for more air.

INFECTIONS

Mouth Rot

YOU SEE

Brownish-yellow material around the bone, or dark material around the jaw.

WHAT TO DO

Antibiotics, and the infected material cleaned out. Veterinary work.

Mouth rot (stomatitis). Mouth rot is a bacterial infection inside the mouth and gums. Left untreated it will eat away bone in the mouth and surrounding areas.

You will notice brownish-yellow substance or dark material around the jaw, visible when you open the mouth. It simply does not look healthy.

The benefit of looking into your chameleon's mouth while it is healthy is to know what it looks like when it isn't. Know what normal looks like and you will recognize the moment it stops being normal. A mouth infection can start with swelling along the gums or signs of discomfort in eating.

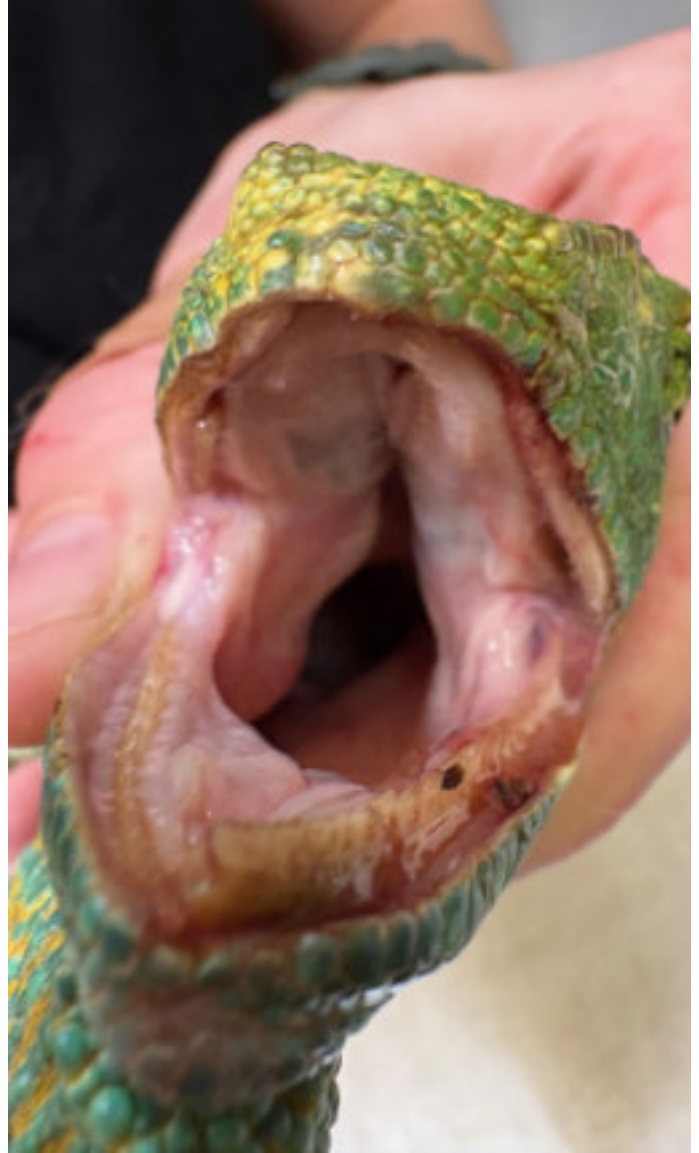
Chameleon teeth are acrodont, meaning they're fused directly onto the jawbone (the row of teeth is called the dental arcade). Note that acrodont teeth aren't replaced. Thus, the loss of part of the dental arcade is permanent. Advanced infection can eat far enough into the bone of the jaw to cost the animal part of the dental arcade. It can also travel into the eyes and eat away the bone in other places in the head area.

An infection like this starts when the mouth is damaged and the immune system cannot fight off the bacteria. This can happen when the chameleon bites down on a spine or spike on the feeder insect that punctures the skin in the mouth. Chameleons are very good at navigating insect defenses, but sometimes the bug gets a shot in. This isn't usually a husbandry issue. But consider removing defensive spikes on the feeder insect. Common concerning structures are the back jumping legs on a locust or the spikes on an adult hissing cockroach which can cause damage if they are bitten down on wrong.

MOUTH ROT



Healthy mouth



Mouth Rot on left lower jaw. The dental arcade in that area will have to be removed.

Look into your chameleon's mouth while it is healthy, so you know what normal looks like!

What to do about mouth rot. Antibiotics are the only thing that treats this, and the area has to be cleaned out. All the infected material around must be removed. This is assuredly a very painful procedure and your vet can provide painkillers to alleviate suffering. This is serious veterinary work and is not a home remedy situation.

INFECTIONS

Internal Parasites

YOU SEE

Lethargy, lack of appetite, eyes closed, general sense of internal distress.

WHAT TO DO

Identify through fecal test, treat with your vet. Strict husbandry hygiene.

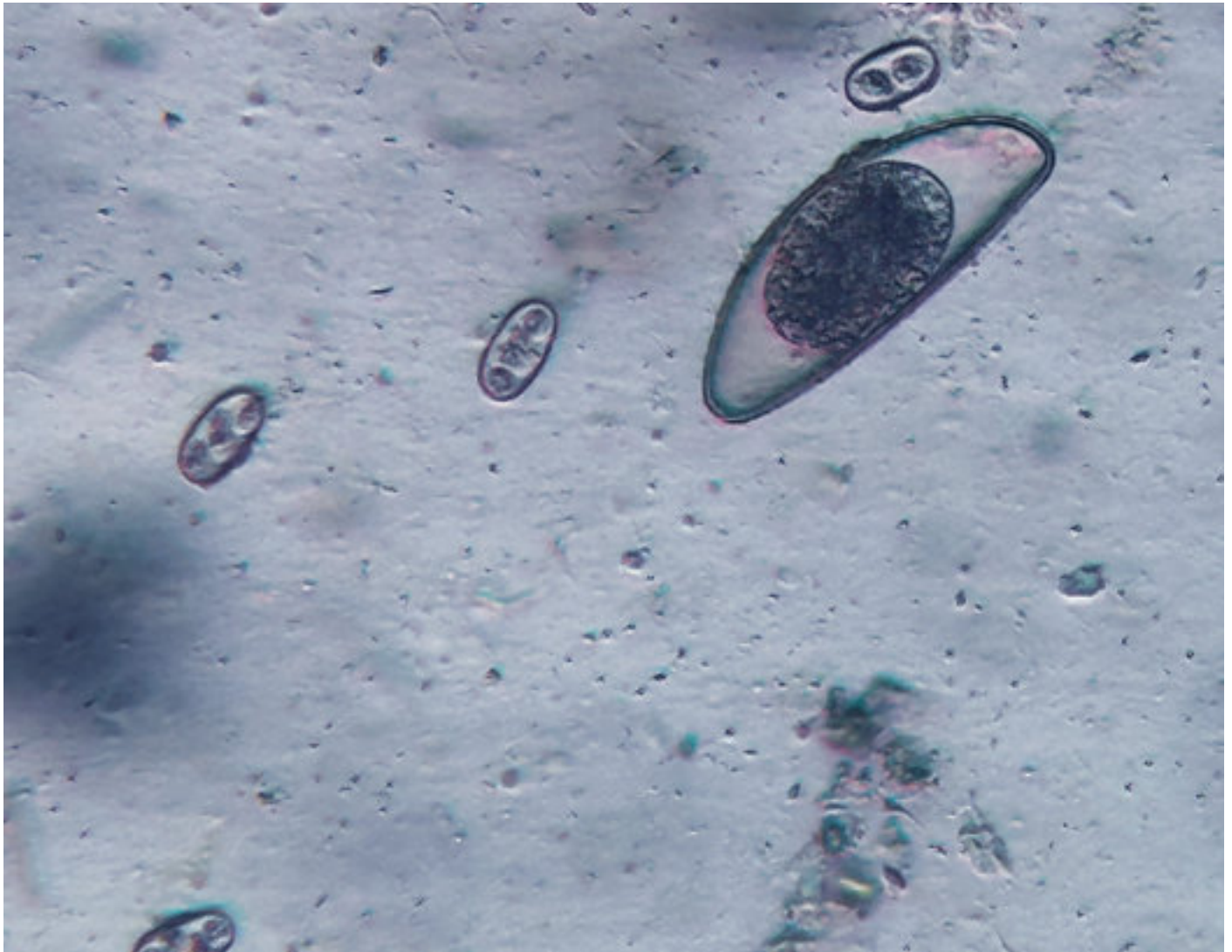
Internal parasites. All wild-caught animals have the potential to carry parasites, and captive-hatched animals can acquire them. Routine fecal checks are standard practice, and a proactive fecal check every year is worth doing on an established animal. Treat under veterinary guidance to make sure you have the right dosage.

The real danger is a parasite with a direct life cycle, which can build up to a heavy load through repeated reinfection. Parson's keepers have an unintended advantage here. Between hand feeding, feeder run cups, and poop landing far below in a large enclosure, feeder insects don't usually contact fecal matter on the enclosure floor. That breaks the most common route of the direct life cycle. Ova and oocysts on the floor rarely get a ride back up to the chameleon. So the reason Parson's keepers so often escape parasite problems is not that the species is immune — it is that our husbandry and their brumation make completing that life cycle difficult.

A microscope takes your husbandry to the next level. It is not required, but a microscope is one of those tools that changes what you are capable of, and it is especially worth it if you have a wild-caught animal. I run a fecal check on every poop with mine. If you want to learn, my course *Hunting Microscopic Chameleon Parasites* covers it.

What to do about internal parasites. Parasites need to be identified and then treated. The most common internal parasites are diagnosed from a fecal sample. Once the type of parasite and the severity is identified, the appropriate treatment plan is selected. Adopt strict hygiene standards in cleaning up the poop as soon as possible after it is deposited. And make sure feeder insects never make it to the bottom of the cage.

INTERNAL PARASITES



Parasites from a fecal sample, under the microscope. The large shape is a pinworm ova and the small pill shapes are coccidia oocysts.

To treat or not to treat... There is a strategy in treating parasites that almost reads like a chess game. There are some times that it is worth not treating. In a situation where husbandry is hygienic it may be best to not treat a light load of parasites. Medicines must be processed by the chameleon's body so they are not entirely benign. Your vet may decide it is best to bring your chameleon's strength up before removing internal parasites and, in the case of multiple parasitic infections, may elect to treat one by one to not introduce necrotic shock. This can happen in a high parasite load where the chameleon's body is overwhelmed trying to clean the body of all the suddenly dead tissue.

HUSBANDRY-CAUSED Foot Sores



YOU SEE

Reddening or swelling on the footpads.

WHAT TO DO

Reduce moisture on contact surfaces. Broken skin needs a topical from your vet.

Foot sores. Parson's are more sedentary in our enclosures than they are in the wild. This makes them susceptible to pressure sores on the underside of the feet as they spend long periods of time gripping a wet branch. It is the reptile equivalent of bedsores. Prevention is the daily dry-out cycle — surfaces need to dry during the day.

What to do about foot sores. If you see reddening or swelling on the footpads, reduce moisture on contact surfaces. Broken skin needs treatment, so ask your vet for a topical treatment. Determine why your branches are not drying out and fix that problem. Less daytime humidity and more airflow are common solutions.

HUSBANDRY-CAUSED Heat Stress

1

**Color washes out,
drops low**

Watch closely.

2

Gaping

Act now.

3

Eyes close

Then death, sometimes
within an hour.

Heat stress. Heat stress can progress quickly and can be deadly. The signs come in order of severity. They can overlap, and your chameleon may show any of them at any stage, but as heat stress gets worse, the next sign on the list appears. First, its color starts to wash out as the animal lightens to reflect heat, and it moves away from the heat, dropping as low in the enclosure as it can and hiding. Those are your signals to watch closely. Then it gapes, holding its mouth open to let internal heat out. Gaping means act now. Then the eyes sink in and, finally, close. Then death. This can happen within an hour of putting a chameleon outside for natural sun. As healthy as unfiltered sunlight is, it is also a relentless killer.

What to do about heat stress. When heat stress is detected get the chameleon out of the sun and into cooler temperatures. A quick way of doing this is by turning on some misters. This can cool the chameleon down even in the cage where it was getting too much sun. When moving a chameleon from a high temperature to a low temperature make sure the difference in temperature is not a shock. Mist with room-temperature water in the shade. No cold water, and no ice. Bring their temperature down slowly, but get on it immediately.

FEMALES AND EGG LAYING

Egg Binding

YOU SEE

Test holes. Eyes sinking in. Eyes closing.

WHAT TO DO

Bring the vet in as soon as you feel it is going beyond your capability to supervise.

Egg binding, or dystocia. Parson's Chameleons can have trouble laying, and there are many possible reasons. One hypothesis is that the fat pads grow large enough to block the oviduct.

What makes this difficult is that your goal is for her to lay naturally, and natural laying is a long sequence. She has to find the right spot, dig, lay, and fill the hole back in. Interrupt her at any point and you have stopped the process.

And a stopped process may not restart. Something in the instinct gets crossed — perhaps her brain registers the eggs as laid when they were not — and she may not dig again.

Now the eggs are retained, and retained eggs eventually go bad. That is life-threatening. There are other conditions that keep eggs from coming out as well, and in all of them the female goes into a downward spiral as her body works to expel them.

So you are caught between two clocks. You want to give her every chance to lay on her own, and waiting too long can kill her.

FEMALES AND EGG LAYING

Reading the Signs

Digging and abandoning holes. By itself this is normal. A female will start a hole, think better of it, and start another. Past the second abandoned hole I would move her to a different location with different laying options. By the fourth, you are looking at a signal that something may be wrong.

Eyes sunken in. That is exhaustion. Laying is hard physical work and it is taking a lot out of her. Females do recover from a stressful laying with sunken eyes, so this is not a vet trigger on its own. But it is a warning sign that she is getting to the end of her rope. Watch closely.

Eyes closed. Chameleons sometimes get their hole digging and egg laying interrupted by nightfall. They can sleep in their hole and will resume the next day. The eyes closed that we are concerned about is when it is during the day. This can be a sign of exhaustion or her body is shutting down. Neither is good news at this point. This is the universal sign of a chameleon going downhill and it is the same signal here as everywhere else in this chapter.

Eggs on the enclosure floor. She is dropping them on the surface rather than laying them in a hole. This is not good, but she is at least passing eggs. The problem is that she may not pass all of them this way, and an X-ray is needed to confirm that she is empty.

The decision. None of these signals are certain, but waiting for certainty is how females die. If you are past the fourth abandoned hole, or she has gone still and has just given up, or her eyes are closing — that is the point at which you consider going to the vet. Your vet may use medication, such as oxytocin, to help start the egg-laying process, or remove the eggs surgically. Your vet will be the best consultant on this as they will be able to judge your chameleon's condition.

COSMETIC AND SHIPPING DAMAGE

Rostral Rub

YOU SEE

From a black mark on the nose to a snout worn down or swollen.

WHAT TO DO

If a wound looks fresh, swollen, or infected, see your vet. Otherwise it heals and scars.



Rostral rub. Chameleons in unfamiliar circumstances such as the first time in a cage or being in a shipping bag may rub their snout raw attempting escape. This can show up as damage to the snout or rostral process. A light rub may simply scar. A rubbed rostral process on a male will slowly fade over the years. A damaged snout may need veterinary assistance if it breaks the skin.

This condition ranges from a swelling on the nose to the snout being worn down far enough that the dental arcade is broken.

What to do about rostral rub. If any wound looks fresh, or is swollen and infected, see your veterinarian for antibiotic treatment. Otherwise, your chameleon should heal and scar and that should be the extent of the problem.

NOT A MEDICAL CONDITION

Shedding



The first time you see it, it looks like something is wrong. The skin dulls, turns white, and comes away. But, despite the horrible look, shedding is a normal aspect of Parson's life. Chameleons grow their entire lives and so, even if shedding events are further and further apart, a chameleon will shed its entire life!

A good shed looks like the chameleon is exploding in white and is over in a day. A bad shed sticks, comes off in pieces over many days, or clings to the new skin. There are several possible reasons for a bad shed, but check hydration first.



Chapter 29

Breeding Parson's Chameleons

It is common for someone to get a Parson's Chameleon and immediately think about breeding. It is an exciting prospect and it could be driven by a sense of purpose for the benefit of the captive bloodlines. While there is truth to this, breeding is a huge undertaking and should be entered into with full understanding of what that means. And that is what this chapter is for.

But if you purchase a wild-caught female, she might be gravid and you may find yourself with an egg-laying situation that you haven't planned! So let's start at the beginning.

Should I Breed Parson's Chameleons?

Breeding chameleons is one of the most exciting ideas, but in reality it is a grueling and expensive project. To be sure, I love breeding chameleons! Seeing that little dragon hatch out of its egg and start looking for its first meal is an experience I never get tired of. But doing it right with individual caging and correct lighting and hydration is a serious investment. And taking care of and selling 20–40 (some report even 60!) babies is almost a full-time job!

If you are looking for ways you can contribute to the captive population of Parson's Chameleons, being an excellent keeper of a single Parson's is desperately needed. There are two ways that Parson's Chameleons disappear from the hobby. The first is that there is no one to breed them and the second is that there isn't enough of a keeper community to support breeders to breed them. If a breeder is left with offspring they can't sell, we lose a breeder. So, yes, if breeding calls to you, there is definitely a need for us to expand our breeder base, but if you want to contribute in a way that is just as important, but with a greatly reduced stress level, pour your efforts into making the best Parson's enclosure possible and share your love on social media. You know what we really need? We need people to show how much they love keeping single females as pets and not breeding. Females are often passed over for the more colorful males, but they are wonderful pets. We need people to help expand the market to support a minimum number of breeders to sustain our captive population.

BREEDING PARSON'S CHAMELEONS

What Breeding Parson's Chameleons Takes

- 1 A compatible pair**
Sexually mature, acclimated, same locale.

- 2 A cooling incubator**
72°F (22°C), and 55°F (13°C) for diapause.

- 3 A cage for every hatchling**
The serious investment.

- 4 Marketing**
Just as important as the breeding.

1. Two sexually mature adults that are acclimated and compatible. The more pairs you have, the more chance to find two that are in the mood at the same time. Finding a compatible pair can take years of acclimation for them to have their receptive window overlap. If you are working with captive-hatched Parson's, you are waiting three or so years before they are sexually mature.

2. A cooling incubator that supports warm periods around 73–75°F (23–24°C) and cool periods around 54–57°F (12–14°C). These can be two separate incubators. Wine coolers are actually pretty effective as diapause chambers.



A rack of individual hatchling cages: one for every egg in the incubator

BREEDING PARSON'S CHAMELEONS

3. Complete individual cage setups for babies. You will need as many cages as you have eggs. This is the serious investment. But you do not want to cut corners. Current sale prices are a couple thousand dollars per baby and no one is going to be impressed with the bite marks, nipped tails, or slowed growth that are hallmarks of group raising. The larger the cages you use for your babies, the longer you can keep them while you try to sell them. The biggest stress in selling a clutch is the deadline of having to sell them before they outgrow their cage. So, you have a decision to make upfront — the larger the cage, the better your experience and the longer you have before your system is too small, but the more space you allocate, the more expensive this is. And you have to invest in the cages, lighting, and hydration systems long before your eggs hatch. Chameleon breeding is a sort of a trap. As challenging as lining up a mating window is, it ends up being straightforward compared to the incubation. And if the eggs hatch, you reach hatchling care. This is where breeders flame out. You get to the hard part when you are too far in to back out. Do it right from the start and this will be a cherished memory. Do it wrong and it will be a nightmare.

4. Marketing. The biggest surprise for intrepid chameleon breeders is that marketing is just as important as the breeding. You have to hit marketing hard at least a year before trying to sell the babies. And that doesn't mean saying you have babies to sell. That means presenting yourself and your breeding standards. You will be spending that year showing people why they should trust you to sell them a Parson's Chameleon! So you will have to develop social media skills if you do not have them already. And you will have to maintain a presence. You will be complaining to anyone who will listen about how it takes just as much work to do the marketing as it does to produce the product. Welcome to the reality of breeding!

The first thing to do is make a wise decision. Are you ready for this commitment? We need breeders. We also need keepers to be examples and lead the way. Pick which one will bring you the greatest enjoyment. The breeders don't exist without the keepers. The community needs dedicated people doing both.

BREEDING PARSON'S CHAMELEONS

Your Pair of Parson's Chameleons



Experienced breeders say they are probably mature at around two years. Three years is the safe number, and many breeders wait until four so the female is in the best condition for her first clutch. Wild-caught Parson's can take a couple of years to acclimate to the new seasons. Whether you go captive-hatched or wild-caught, finding a compatible pair will be an exercise in patience. Then again, you could get lucky and have a gravid wild-caught female lay her eggs! The point is to go into this without expectations of a quick clutch of eggs. It could take years to get to your first successful mating and egg laying.

Do your very best to make sure that both your male(s) and female(s) are from the same locale. While cross-locale mixes make great pets, every breeding that is of a mix takes us backwards as far as establishing Parson's Chameleons with their original locale color palette.

In your everyday setup, keep your female Parson's Chameleons from being able to see the males. And, of course, other than the brief mating attempts, no Parson's should be cohabitating with each other. Either of these conditions can trigger a female to produce a clutch of eggs without them being fertilized. I can tell you from personal experience, the only thing more frustrating than waiting until your male and female have their windows of compatibility overlap is to waste a successful egg-producing season with infertile eggs. Do not do this to yourself or your female chameleon!

BREEDING PARSON'S CHAMELEONS

Introducing the Pair

There is no one time of the year when you know you will be successful introducing your pair together for a mating attempt. The problem is that Parson's look to environmental triggers to get into a receptive state. Finding an overlapping receptive window while two individuals are trying to acclimate to a new season schedule can be tricky. My personal experience with outdoor keeping in Southern California is that acclimated individuals become interested in breeding in the August/September time frame. But I had newly imported individuals mate in February, which would correspond with their wet season in Madagascar. Your mating schedule becomes predictable with long-term, multi-year captive Parson's.

To introduce them I bring the female into the male's cage and watch the reaction. You might see both of them look at each other and make no move. If the male starts the slow head bobbing, you know he is in the mood and it depends on the reaction of the female. If she is receptive she will allow the male to come behind her and mount her. If she is not receptive she will move away from him or even head towards him and climb on top of him. In extreme rejection, she may warn him off with a gape, which is not a bluff if he does not get the message. Split them up if you get rejection signals to avoid stress to your female or bite damage to the male. By keeping them in a cage we have blocked the female's ability to remove herself from the situation and so we must step in and be an escape if necessary. If there is a successful mating you have the option to leave the pair together for a few days to see if there might be subsequent matings. But keep a close eye on them to pick up on when she has had enough of the close proximity to the male. Once she is out of the male's enclosure (whether mating was successful or not) have the female visually isolated from the male.

If moving the female into the male's cage is not successful, try having the male visit the female in her cage. Different territorial dynamics may produce different mating results!

INTRODUCING THE PAIR



If she is receptive, the life cycle starts here.

BREEDING PARSON'S CHAMELEONS

The Gravid Female



KEEP IN MIND

Keep her visually isolated from the male, and give her privacy from you as well. Gestation is typically three to four months.

If the female produces a clutch of eggs from the encounter with the male the eggs may or may not be fertile, but she will be carrying them for the full gestation and will need to go through all the stages of development. During this time, keep her visually isolated from the male. Give her privacy from you as well. Gestation is typically three to four months. During that time pay special attention to her nutrition. A once-a-week calcium dusting is still a good amount, though some breeders will give more calcium during gestation. I am careful not to overfeed her before she mates, but afterwards I will give her as much as she will eat and will be extra attentive to providing a varied diet. Of course, it is difficult to tell if she truly is gravid just by looking at her. An X-ray will be the definitive way to tell if eggs are developing. And, in the later stages, you can also gently feel her belly to see if you can feel eggs. Nutrition, ample hydration, and privacy are the winning ingredients to a successful gestation.

BREEDING PARSON'S CHAMELEONS

Egg Laying

When the female gets ready to lay eggs she will start exploring the bottom of the enclosure. For a female that is generally active this may not be that much of a departure from normal activity so it doesn't hurt to have a lay bin available to her after two to three months. I have had Parson's Chameleons lay in the normal plant soil at the bottom of my planted cages, but others have had great success with slightly moistened play sand, or a trash can with moistened sand at the bottom and a potted plant on the sand. This can trigger a female to lay if she is being picky with the soil. You can use 8" (20 cm) of substrate. The female usually starts digging in the morning. She will dig down and then turn around in her hole so she is looking out and deposit her eggs in the hole. After 20–40 (or more) eggs are laid she will methodically fill the hole back in. The whole process takes much of the day. Do not disturb her while she is laying eggs. I know you want to check up on her every ten minutes and document this event. If you engage with her too much she might abort the laying process. I have never had a Parson's be disturbed and then observed how long it would take for her to recover. In Madagascar I did observe a panther chameleon female get disturbed while laying eggs, run away, and then, hours later, come back to the same hole to successfully finish the laying process. Would we have the same luck with a Parson's? I do not know. If you do accidentally disturb her and she stops the hole preparation process, give her strict privacy on the chance she may go back to it. While she is digging it is best to shut off the misting systems. You will be giving her a serious rehydration after she is done! You know she is done when she has filled in the hole and climbed back up into the branches.

Note that she should never seem to fade during this entire process. Sunken eyes during laying mean it is taking a lot out of her. Females do recover from a stressful laying where their eyes sank in, so this is not a vet trigger on its own, but it is a warning flag: she is getting to the end of her rope, and you need to watch closely in case it progresses to closed eyes. Closed eyes are a sign that there are dangerous levels of stress and discomfort. Your level of experience will dictate how long you mitigate circumstances before getting veterinary care. If you feel you need help, get it.

EGG LAYING



Digging the laying hole.



BREEDING PARSON'S CHAMELEONS

Digging Up the Eggs

Before searching for the eggs, prepare the container that you will put the eggs in. The eggs can be placed on a bed of vermiculite, perlite, or any mix of sand and soil. What is important is that there is a substrate around the eggs that can keep a low level of moisture around the egg. If I were using vermiculite I would put just enough moisture in the vermiculite that when I pinched some pieces between my fingers it would leave a moist spot between my fingers, but not a drop of water. Any other substrate will need to be damp, but not saturated.

Retrieving the eggs is a careful operation in itself. You have to dig eggs up without accidentally cracking the first egg you encounter. This means digging slowly and carefully. Put on some music and settle in for a relaxing time gently digging in substrate. It gets more fun if you aren't sure where she laid her eggs. How can this be? Well, I have come home to find chameleons much lighter in weight and with dirt still on their heads and no clue where they laid their eggs. Try to see if you can find spots where the ground cover or leaves are disturbed. Otherwise, block off the rest of the day to methodically dig and find. Your main clue is that they generally (though not always) like to lay their eggs against a hard surface. So, start at the edges of the container. And then, gently brush soil aside and get deeper and deeper. This is not the time to get bored and impatient.

The question sometimes comes up — why do we not just leave them in the soil? That is actually a viable option for species without diapause like panthers and veileds. But, with Parson's, and many of the Calumma species, the eggs go through cool periods, and those low temperatures are not easy to replicate in a large container of dirt.

When you reach the eggs, take them out one by one and place them in the egg incubation container so the same side is up. I make an indentation with my finger in the incubation substrate that allows me to set the egg in lengthwise and deep enough that more than half the egg is in the substrate. It will be important that the same side is up all through the incubation. When all eggs are extracted the container can go into incubation.

DIGGING UP THE EGGS



Dig slowly, without cracking the eggs. Each one goes into the container the same side up as it was laid.



Parson's Chameleons eggs require a cooling incubator.

Photo courtesy of Robin Villere



A close-up look at Green Giant Parson's Chameleon eggs at Nealon Reptiles.

Photo courtesy of Robin Villere

BREEDING PARSON'S CHAMELEONS

Female Care

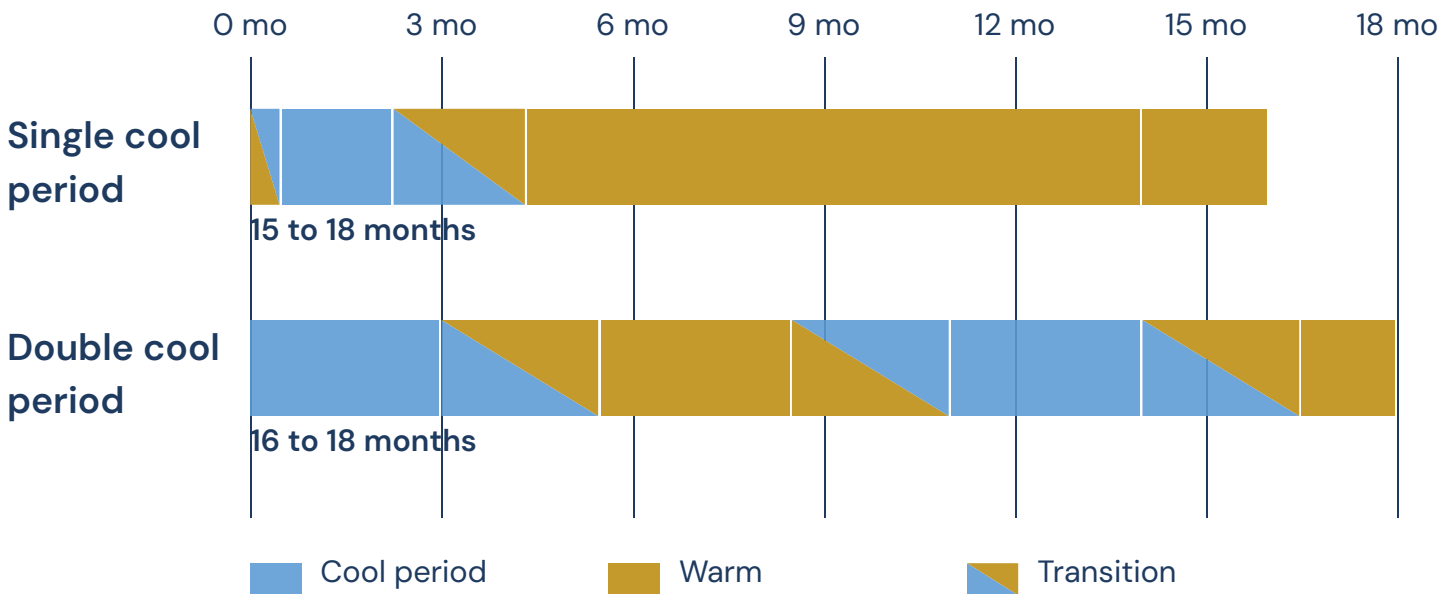
After your female lays eggs, give her two weeks of recovery with the same level of service (water and food) that you gave her while she was gravid. You are helping her get back to full health after the egg development and laying experience. Continue to give her privacy during this recovery time. Ease into the regular adult diet frequency after her two weeks of recovery.

Incubation

Incubating eggs has been the most challenging part of the Parson's Chameleon life cycle. They have famously long incubation periods, but what is not clear is how much of that is nature and how much of that is us not getting some parameter correct.

There are two incubation approaches currently used. Both are reported to produce healthy babies.

TWO METHODS, SIDE BY SIDE



Both methods are reported to produce healthy babies. The last warm period runs until hatching.

INCUBATION

Single Cool Period

Single cool period. This is the method used by Belgian breeder Jurgen Van Overbeke, who shared it with me directly.

PHASE	TEMPERATURE	DURATION
Ramp down from laying temperature	18°C → 14°C (64°F → 57°F)	2 weeks
Cool period	14°C (57°F)	6–8 weeks
Ramp up, 1°C per week	14°C → 23°C (57°F → 73°F)	~9 weeks
Warm season	23°C (73°F)	~9 months (to month 14)
Final warm period	24°C (75°F)	until hatching

Total: 15 to 18 months. No day/night temperature fluctuation, and no moisture manipulation beyond keeping the substrate moist throughout.



A hatchling Orange-eyed Parson’s Chameleon
hatched by Jurgen Van Overbeke
Photos courtesy of Jurgen Van Overbeke

INCUBATION

Double Cool Period

Double cool period. This is the method published to the Chameleon Forums by Garrett Smith in 2014 and described by Craig Durbin on Chameleon Academy Podcast episode 122.

PHASE	TEMPERATURE	DURATION
First cool period	14°C day / 12°C night (57/54°F)	3 months
Transition to warm season	rise to 22–24°C (72–75°F)	2–3 months
Warm season	24°C day / 22°C night (75/72°F)	3 months
Transition to cool season	drop to 12–14°C (54–57°F)	2–3 months
Second cool period	14°C day / 12°C night (57/54°F)	3 months
Transition to warm season	rise to 22–24°C (72–75°F)	2–3 months
Second warm season	24°C day / 22°C night (75/72°F)	until hatching

Total: 16 to 18 months. Substrate is kept drier through the cool periods and wetter through the warm ones, with the most moisture in the final month.

Calumma parsonii cristifer is typically given the single cool period and hatches around 13 to 14 months.

Published accounts going back to the 1990s include successful hatches using two cool periods, one, and none at all. There is, obviously, ample space for further experimentation.

BREEDING PARSON'S CHAMELEONS

Hatchling Care

Like any chameleon, when Parson's hatch healthy they are quite hardy. And now starts your long journey to raise them up! The biggest challenge is having a cage for each baby. A common question is how long they can be kept together before separating. This is a question asking how much improper husbandry can you get away with. The answer is that the more improper husbandry they live with the more internal stress they will have. Yes, people compromise the husbandry and get away with it. And, some don't. The babies may or may not show overt aggression, but dominance battles start immediately.

The babies will hatch and be ready to eat within 24 hours. *Drosophila hydei*, the larger of the common fruit flies, and one-week-old crickets are appropriate feeders for hatchlings. Fruit fly cultures are not always available as "blooming."

They can take the same conditions as the adults, but you cannot use the same equipment without toning down the output to avoid overwhelming the babies. Example: raise the UVB light up so the baby can escape the UVB in their smaller cage.

Avoid supplement powders and calcium for at least three months. After that, move to the standard schedule: calcium once a week and a multivitamin every other month.

Conclusion

The total investment in space, time, and money to raise Parson's Chameleons is significant. It is one reason there are very few Parson's breeders — the barrier is not knowledge, it is patience, infrastructure, and commitment.



Chapter 30

Community

One of the most satisfying things about keeping a Parson's Chameleon is sharing your experience with other Parson's Chameleon keepers.

The people working with Parson's Chameleons are the best source of current, practical knowledge, and there is no substitute for hearing how someone else's animal behaved in conditions like yours. I can write ideal care parameters in this book and get you started. These parameters are just the baseline and everyone should take cues from their chameleon as to how to fine-tune it. Someone who has already gone through that process is a priceless resource.

Where Things Stand

A very small number of breeders have been carrying this species. The clutches are relatively large — twenty to forty eggs — which can make the supply look more substantial than it is. We get a spike of availability that saturates the market for a few months. But that is deceptive.

The number of people consistently producing Parson's Chameleons is small enough that if one or two step back, availability drops hard.

You Do Not Have to Breed

The paragraph above can read like I am saying everyone should breed Parson's Chameleons, and that is not the case. The community needs breeders to keep a well of bloodlines going. But the fact is that it needs many more keepers who give these giants great homes and are excellent examples of how to keep them properly. We need both of them for long-term establishment. Keeping one Parson's Chameleon well — especially a female, since they are less in demand — is a real contribution to this community, and you never have to produce an egg to be a valuable part of it.

Nothing Here Is Guaranteed

Parson's Chameleons come out of Madagascar under tight control, and export can stop at any time.

It has before. There was a stretch of nearly two decades when Madagascar was closed for most chameleon species. We simply could not get Parson's Chameleons. Anyone who has been in this hobby since before that closure in the

1990s understands how fragile the present moment is. Since about 2014, Parson's have been exported under an annual quota set by Madagascar under CITES, the treaty that governs international wildlife trade. Quotas get reviewed, adjusted, and set back toward zero. Countries close, and they do not always give notice.

I am not going to turn this into a conservation chapter. While important, this book is focused on the animals already in captivity, and the people willing to refine their husbandry and work at establishing more bloodlines. They are what stands between this species being available to keepers and it being a chameleon that we used to know.

A Chronicle, Not a Manual

This is a dynamic situation. We are aggressively documenting husbandry from different areas. Everything we learn goes into the next edition of this book. That is the reason this is a chronicle rather than a manual. When one of our keepers brings a clutch through incubation, what they did goes in these pages. When something does not work, that goes in too, because the failures are worth just as much as the successes.

Come Learn with Us

Chameleon Academy, at ChameleonAcademy.com, is where we gather and share.

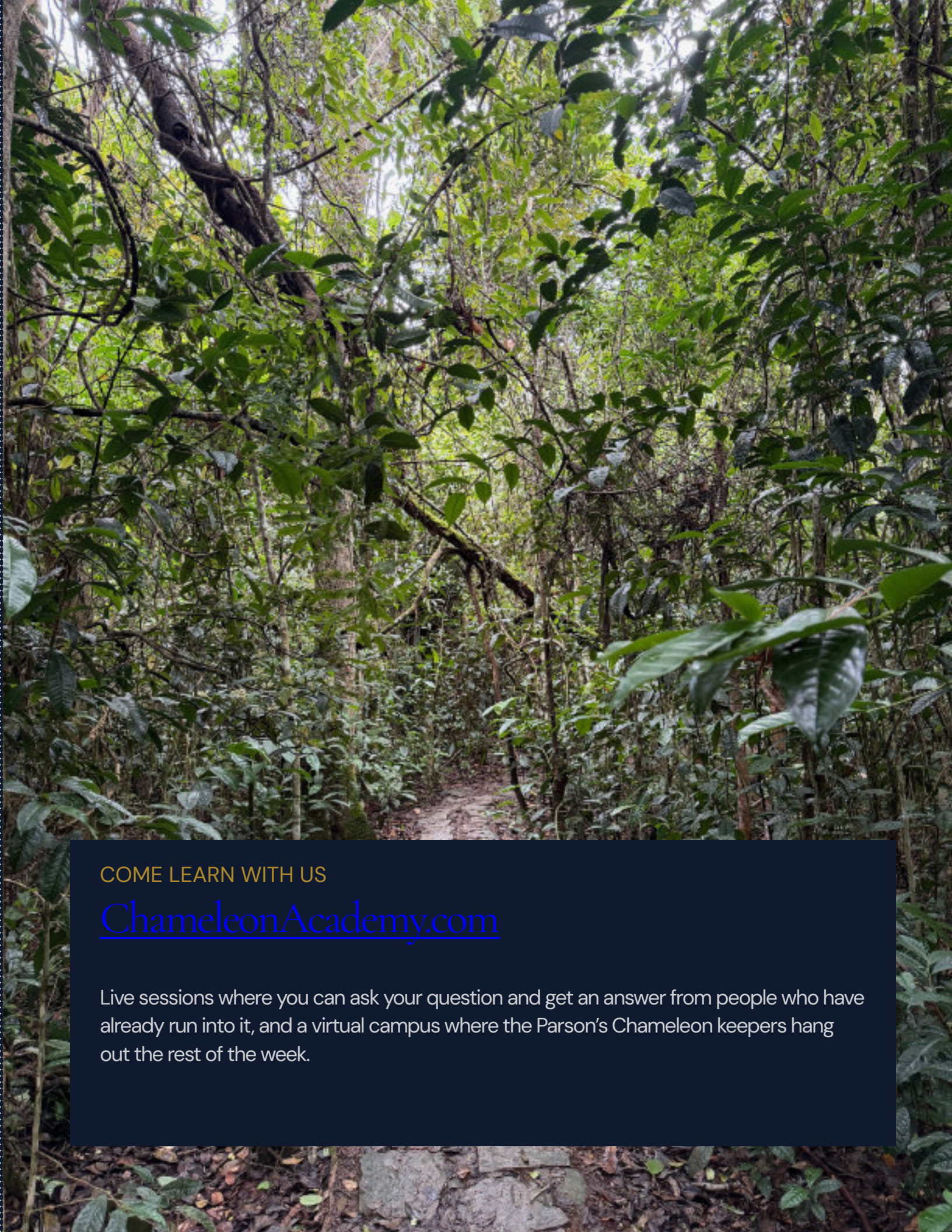
The live sessions are where we work through this together in real time — you can ask your question and get an answer from people who have already run into it — and the virtual campus is where the Parson's keepers are the rest of the week.

What we are is simple: a group of people working on the same problems who tell each other what happened.

Where This Leaves You

Whether you are keeping a single animal as a pet or working toward breeding, you are part of an effort to establish a species in captivity that we are lucky to have here at all.

Invest in this experience. Observe your animal. Share what you find. And recognize how special this window of time is for us in the chameleon community.



COME LEARN WITH US

ChameleonAcademy.com

Live sessions where you can ask your question and get an answer from people who have already run into it, and a virtual campus where the Parson's Chameleon keepers hang out the rest of the week.