GENERAL CARE FOR UROMASTYX (2.0)

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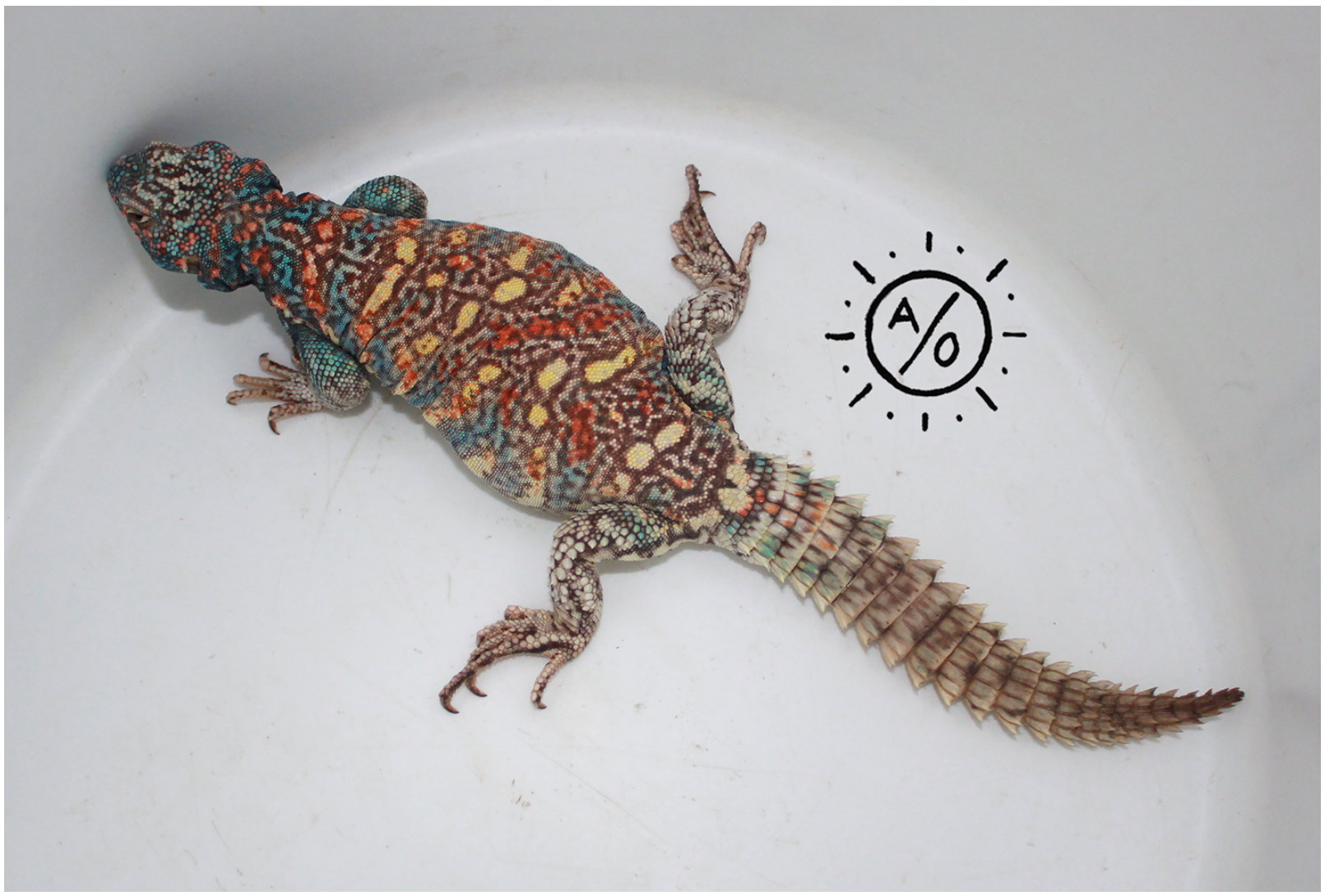

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INTRODUCTION

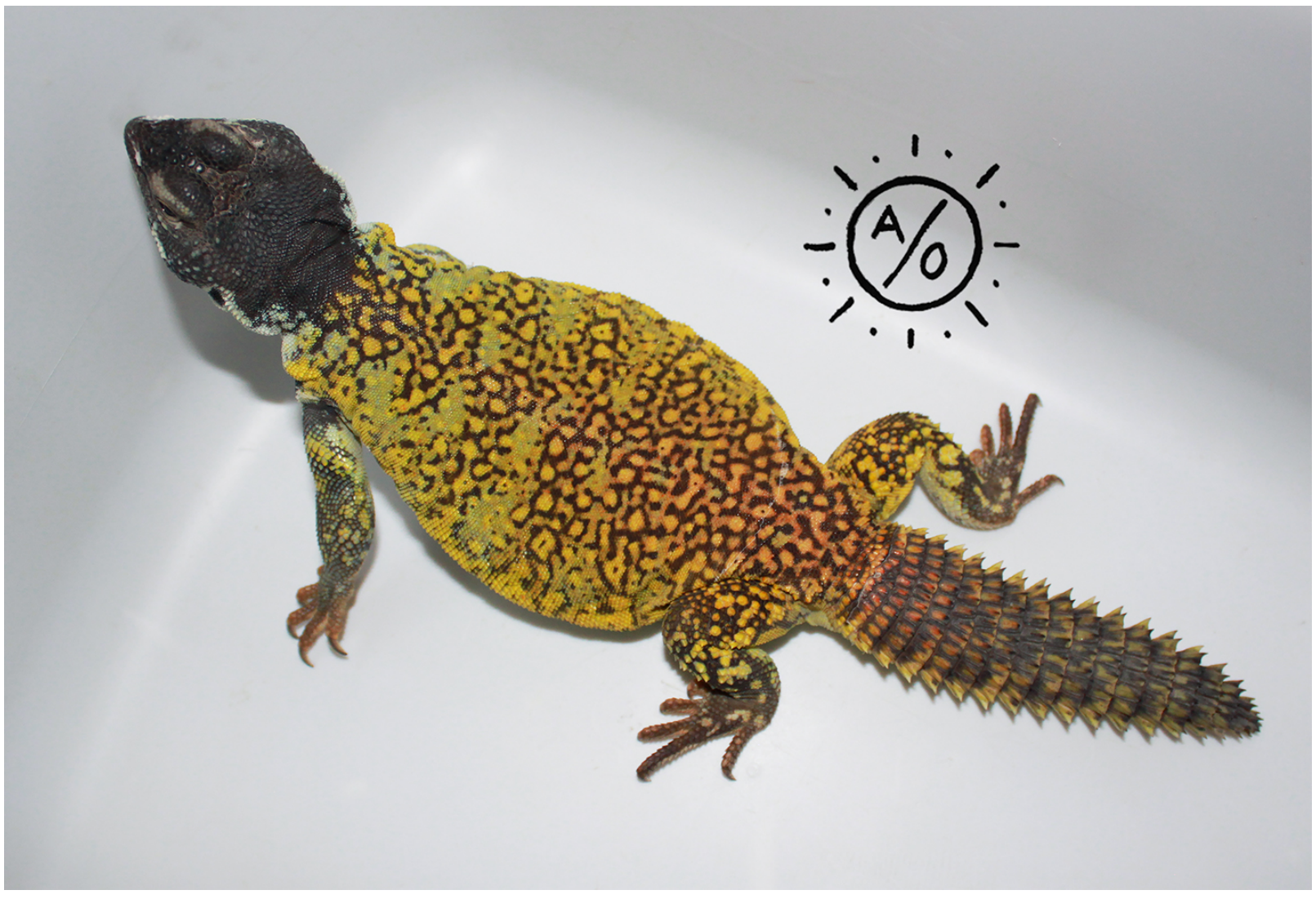
There are many ways to raise a happy and healthy Uromastyx! Curiosity, flexibility, creativity, adaptability, and patience are cornerstone virtues when working with these lizards (or all reptiles for that matter). If you properly prepare for your Uromastyx you will have an extremely rewarding reptile companion for decades! Please note that all of the content in this article is based on my own experience with Uromastyx and is not intended to be prescriptive. I am not a scientist or biologist, I am a dedicated herpetoculturist and what I outline in this article are the methods and concepts that I've used for success over the last

decade and beyond. I will continue to update this guide as time progresses and I gain new information and insight. I first published this guide in 2019 and last updated it in September of 2023. Continued revisions will be created for as long as I'm capable of doing so, ideally with sufficient time between versions to allow for new insights and ideas.

The genus Uromastyx is a group of small to large sized mostly herbivorous desert lizards that spans a massive range that from Morocco though the Middle East and into India and Pakistan where they become the closely related genus of Saara. The genus contains about 18-20 species and subspecies depending on the current state of classification. Blunt triangular heads, long tails armed with protruding spines, an array of unique color forms, and charming personalities make them extremely rewarding animals to keep and breed. While they have been sporadically imported in modest numbers for quite a long time, they have never truly been established in U.S. Herpetoculture.

This beautiful group of lizards deserves a great deal more attention than it currently receives in U.S. Herpetoculture. While Uromastyx have always garnered a decent amount of popularity and demand, they are on a steady rise as an increasingly sought after pet reptile. Their care resembles a strange combination of desert tortoise, monitor lizard, and chuckwalla. Most of the species are small to medium sized which makes providing for them relatively easy, and their simple diet also makes them affordable to maintain, not to mention their ability to become excellent pets. I am working very hard to make captive bred Uromastyx (specifically ornata, geyri, thomasi, and yemenensis, discussed more in the

section titled “The Future”) more present in the U.S., but I have a long road ahead. This care sheet is intended to be a guidebook to help new owners and other breeders and to offer some insight into how I care for and think about Uromastyx. I’m extremely passionate about these lizards and my hope is that this work will help elevate the baseline standard of care for all of them in captivity. These lizards are not only visually spectacular but also smart, long lived, emotionally complex, and intelligent. Every day I learn more about their needs and with each passing year it becomes more and more clear why I have devoted a career to their propagation. I hope this guide will help others contribute to making these amazing animals not only more well cared for on average but also more available for future generations of herpetoculturists.



FINDING A UROMASTYX

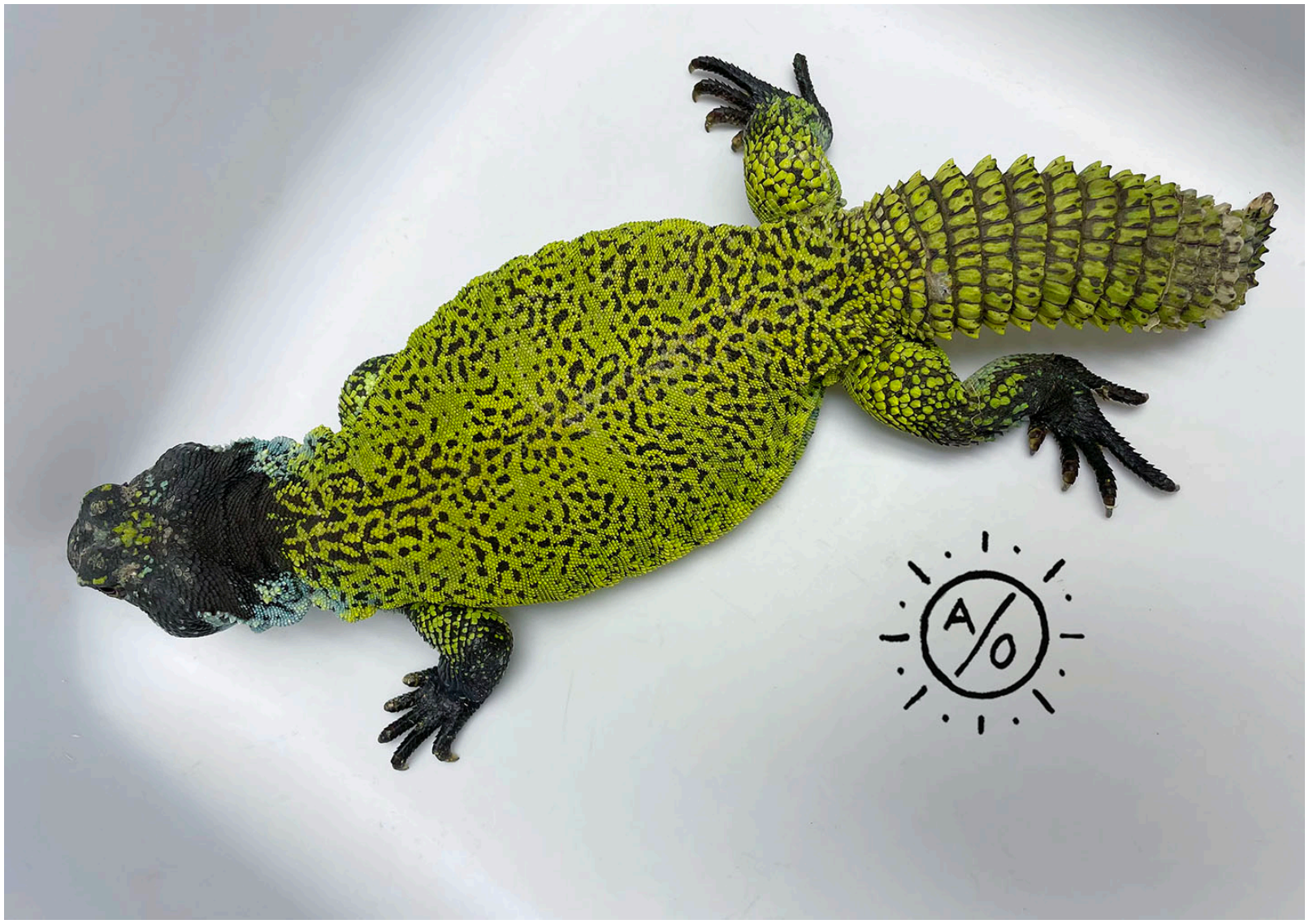
Uromastyx are still rarely bred in captivity in the U.S.A. This fact is changing with time and as of this writing (2023) there are increasing numbers of keepers having success breeding select species. However consistent availability of healthy animals remains a big challenge and some species remain essentially unobtainable to the average keeper. A useful rule is that 99.9% of all Uromastyx in captivity are imported from the wild. There are upsides and downsides to purchasing a wild caught animal, but the reality is that most buyers don’t have a choice. Both captive bred and wild caught animals have the same potential for becoming great pets, though it’s likely that a wild caught individual will take

significantly longer to adjust to captivity and much longer to learn to trust a keeper. Wild caught Uromastyx may have injuries or parasites that require treatment while you can usually expect a captive bred animal to be in top condition and likely already rather tame. Supporting captive breeding efforts is hands down the best choice for both the animals and the keeper and should be made a priority. Most breeders' availability is seasonal so expect more difficulty in finding these lizards for sale in Fall and Winter which are typically the off season for breeding.

There are great resources in Facebook groups (listed at the end of this article) that provide information to help buyers locate breeders. Beware that many sellers (mostly wholesalers) claim their animals are captive bred without being able to verify this claim. Sellers who cannot show photographic evidence of their breeding success (or at least give you the name of who produced the animal) are likely selling wild caught Uromastyx. This isn't necessarily the fault of the dealer since often times they are told the lizards are captive bred by those exporting from their country of origin. There have always been rumors of "farms" in parts of Uromastyx native countries, but I have yet to see much credible evidence of the existence of such places and assume anything labeled as "farm bred" is in fact a wild caught animal. As breeders such as myself (aridsonly.com) improve methods for breeding it is becoming increasingly unnecessary for the average keeper to purchase imported Uromastyx. I strongly suggest that anyone seeking Uromastyx take the time to find a dedicated breeder with an outstanding reputation from whom to purchase. The steady increase in people insisting on purchasing captive bred animals can help make the importation of wild animals a thing of the past.

The same rules for picking a healthy lizard of any kind apply to picking a Uromastyx. If you have the option to choose from more than one animal, try to pick one that has visual signs of good health. These signs include good muscle tone and body weight, little to no scarring on the scales/skin, bright and clear eyes, no difficulty breathing, and a mostly clean ventral area. Other concerns that are worth noticing are: obesity, bite marks or injuries from past or present cage mates, burns, swollen digits, jawlines or eyes, missing toes, any challenges in typical physical movement, and any crust or discharge around the mouth and gums. Any new pet may require veterinary care, but picking the right animal can help make that much less likely.

Friendliness exhibited by a Uromastyx may not be a good reason for picking one animal over another. This is because it is very common for a Uromastyx to behave in a relaxed manner in one setting but then revert to a skittish and shy state when moved to a new home. Expect any Uromastyx to be shy, flighty, and averse to handling in the initial months of bringing it home, this goes for captive bred animals as well. But do not be discouraged! These animals can live for 30-50+ years when cared for properly, so a few months of shyness is nothing compared to the long term trust you can build with your animal over years of patient work.



HOUSING

Set yourself up for success with your Uromastyx by providing them a high quality enclosure from the very start. What follows are my preferred enclosure concepts, but remember that larger enclosures are *always* the better option. I recommend using an enclosure no smaller than 4ft long by 2ft wide by 2ft high for a single adult of most species of Uromastyx. Exceptions to this size enclosure are larger species; U. aegyptia, U. acanthinura, U. nigriventris, U. flavifasciata, and individuals exceeding 16 inches (STL) in length. For the larger species excluding U. aegyptia something closer to 6 ft long by 3 ft wide by 2ft high should be considered a minimum. For U. aegyptia (including the subspecies U. a microlepis) I suggest using nothing smaller than 8ft by 5ft by 3ft and the larger the better. My adult U. aegyptia were housed in large open top pens that measure 8.5ft long and 5ft wide. As of 2023 I have donated my Egyptian Uromastyx to a zoo in Florida because I now hold that this species is not suited for the pet trade. Even if you have a young animal it's good to offer them the same size cage you would an adult. It may be convenient to keep a baby Uromastyx in a smaller enclosure until they grow larger, but the change from small to large enclosure can often cause a lot of stress. Youngsters will make great use of the larger space in an adult sized enclosure and you will be happy that they can grow into their home rather than having to move them and stress them out after a couple years.

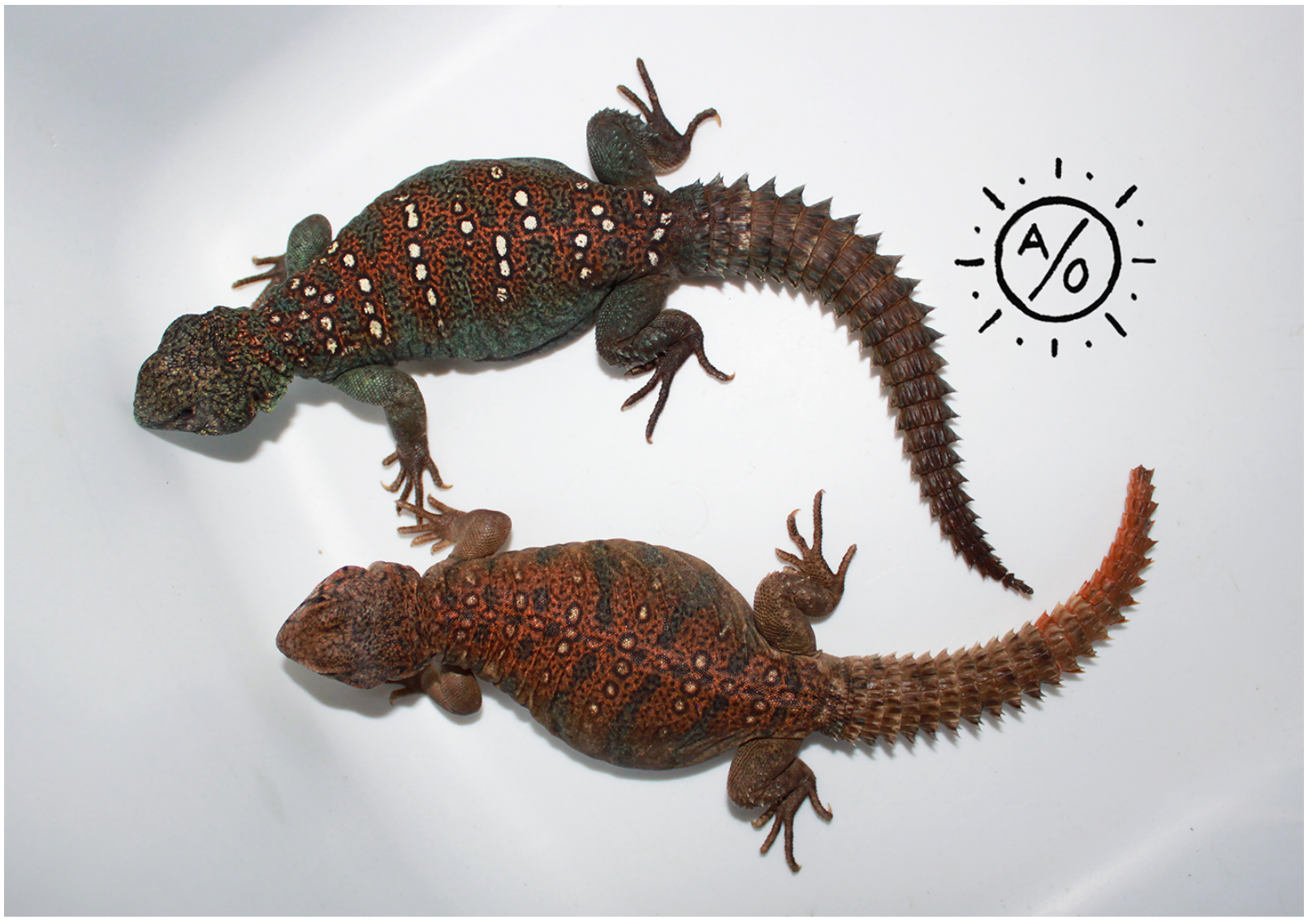
Options abound for how to build or purchase an enclosure. There are numerous manufacturers of reptile cages to be found online and building one yourself is a common

practice. Cages can be constructed out of wood, PVC, water tanks for livestock, certain plastics, glass, aluminum, heavy duty screen, and stone can be used outdoors. Keep in mind that open top or screen and aluminum cages that allow the free flow of air through the cage will require more lighting/power to heat them to optimum temperature. I use two types of open top pens at my facility. One version is constructed of melamine as an open top box and the other is made of two kiddie pools (the blue plastic outdoor pools used for kids and dogs) fixed together at the rim with screws creating a circular open top pen. Both work very well but neither is all that visually appealing. Most keepers prefer front opening cages with either glass or plastic viewing windows that make much better display pieces. Make sure whatever cage you choose is secure, fire safe, durable, and very well ventilated.

While some keepers house Uromastyx in pairs, it's my opinion that these lizards are best kept alone for the majority of the year. This excludes freshly hatched babies who tolerate communal housing for a short period of time in early life. Uromastyx are highly territorial and while this usually manifests itself as obvious fighting between animals, it can also be expressed in very subtle ways that are not obvious to inexperienced or even moderately experienced keepers. These subtle acts of aggression result in negative downstream consequences that may not reveal themselves for months or years. Unfortunately many keepers either miss or flat out ignore these warning signs until it's too late. Unless you work from home and have spare cages at the ready, I strongly suggest housing your Uromastyx alone for the majority of the year. I am not recommending solitary confinement. If you have more than one Uromastyx there are plenty of safe ways to allow brief visits for both socialization and breeding. These visits should always be supervised to avoid injury to the animals involved.

If you'd like to disregard this advice and try to pair your lizards in the same enclosure, make sure you have a backup enclosure ready in the event that you need to split them up, even if just temporarily. Other considerations when trying to house multiple Uromastyx together include providing multiple basking zones, numerous hiding places (not just store-bought hides, this means small and tight crevices that can fit only a single lizard at a time), and many visual barriers and obstacles. The idea is to allow each lizard to be able to get all they need to be happy without being forced into each other's space. As of this updated writing (September 2023) I no longer believe that these features will be enough to prevent fighting between Uromastyx long term. I try every season to cohabitate Uromastyx in many different types of enclosures and they inevitably always end up fighting one another. It's common for people see wild photography of multiple Uromastyx basking together and assume they can be housed that way in captivity. The most important difference between the wild and captivity is that in the wild either animal can flee from the other at any time which is essentially impossible in a captive setting.

In order to create a visually interesting and compelling setup research is paramount. Utilize books and the internet to find photographs of Uromastyx in their wild habitat. Note what sort of habitat your species comes from and do your best to mimic those conditions in its enclosure. Prioritize functionality over aesthetics. Just because a setup looks great doesn't mean that it will make a Uromastyx feel happy and safe. Improvisation can be helpful, you don't have to make an exact wild replica, but research into wild habitats should give you some ideas of what will make your lizard comfortable. As an example U. thomasi is native to Oman. Their habitat is extremely flat, with few large stones and few large plants/ trees. Therefore the way I setup U. thomasi is different from the way I house U. ornata which inhabit massive rock outcrops and cliff sides. Observing how other keepers house their animals can also be educational and reveal ideas you may not have considered yourself.



This is another benefit to joining groups on social media that are full of both new and experienced keepers seeking to better their animal husbandry and share success.

There are many different options for what to use as bedding for Uromastyx. Some substrates I have used over the years are slate, tile, sand, gravel, soil, and cypress mulch. Mixes of these materials also work well. Each bedding has pros and cons, but all are safe options. It doesn't hurt to try more than one and see what you or your animal like best. My preference is a tile, slate, or stone bottom and/or mixed sand and gravel. Many keepers will recommend that Uromastyx under 50 grams be kept on paper to avoid threats of impaction,

though I have housed hundreds of animals smaller than 50 grams on sand and gravel for years with no issues yet to report. But playing it safe is totally acceptable, so use your best judgement for the animal and for your own peace of mind when deciding on a substrate.

Beddings I strongly suggest you avoid for any size animal are millet or seeds, clay (Excavator Clay and Stone Desert), sand substrates that are exceptionally fine or dusty, calcium sand, and crushed walnut shell. Substrates like these present significant health risks to your Uromastyx, especially younger or freshly imported animals in ill health. Seed bedding offers no traction which makes the lizards nervous and likely present ergonomic problems since it makes running/walking normally difficult. Animals kept on seeds regularly eat them (one of the reasons it was chosen to use in the first place) but this is probably not a good reason to use it as substrate. Over the years I have received several animals from homes that used seeds as bedding and those animals passed seeds in their stool for weeks after being in my care. This made me feel very uneasy about using it myself. Clay and super fine dusty sand substrates seem to dry out the lizards and the dust can cause swelling and irritation in the eyes. Crushed walnut shell is one of the only substrates that can be a cause of impaction. Most granular bedding is safe for healthy Uromastyx, but crushed walnut shell is a major exception. Do not use it!

Objects and furniture to use in your enclosure include rock and stones of varying shapes and sizes, slate, tile, bricks, roofing tiles, overturned and broken planting pots, grape wood, mopani wood, cork bark, manzanita branches, and manufactured furniture or hide boxes. Please exercise precaution and safety when arranging cage furnishings! It is not uncommon to hear about animals being killed by the crushing weight of stones or large logs. These animals are stronger than they may seem and can push or dislodge objects in their enclosure. Make sure any heavy items in the cage are secure, cannot fall over, and that the animal cannot dig itself under them and get stuck. Try to arrange the cage furnishings so the animal has access to many different hiding places. Uromastyx are similar to American Chuckwallas (Sauromalus ater) in that they feel most secure in small tight hiding spaces like rock crevices or burrows. Having many refuges to choose from will help make your Uromastyx feel comfortable, safe, and brave enough to explore without too much fear.

It’s my preference to have the features and stones scattered throughout the enclosure with the largest congregation (both in terms of size and in number of hiding places) occurring in and around the basking zone. I always have a single flat surface that receives the majority of the heat from the basking lights as the primary basking surface but also provide 2-3 secondary basking surfaces that receive less direct heat. I’ve noticed that sometimes Uromastyx use the primary surface and other times prefer the slightly cooler lounge surfaces. Try to give your Uromastyx more than one place to bask under the UV light at different distances from the lamp. These spots should be separate from the basking lights

so the animal can soak up UV without being heated if they so choose. Some species such as U. ornata, U. ocellata, and U. yemenensis are excellent climbers and will appreciate a lot of vertical space to climb and explore. Others such as U. thomasi, U. aegyptia, and U. d. maliensis will use features of varying height, but usually won't climb nearly as well or as high as the more agile species.

Humid hide boxes are a great addition to any enclosure. A humid hide is designed to mimic the home burrow a Uromastyx would use in the wild which are high in relative humidity. There are many different ways to provide a humid hide. Some keepers use small Rubbermaid totes filled with a lightly damp bedding of sand, coco fiber, or a mixture of mediums. Cut a hole in the side or top of the tote and add a corrugated tube or PVC tube as an entryway. Another option is to put moist bedding under one or more hiding places in the enclosure and rewet them periodically. Humid hides are not a required aspect of housing but access to one will help keep your Uromastyx healthy over the long term.

Food bowls come in many different shapes, sizes, textures, and depths. While most kinds of bowls will work just fine, I prefer to use shallow overturned plastic lids from discarded ice cream containers or plastic plant water saucers. I like these because they are affordable, shallow enough for the lizards to easily access the food inside, and very easy to clean. Water bowls should be similarly shallow and small. Most keepers don't offer water bowls for their Uromastyx because they can derive most of the water they need from their diet of fresh leafy greens. But some individuals will drink if given the opportunity, so once again be responsive to your animal and see what suits their desires. If you live in a humid

part of the world having standing water in the cage might not ideal. Bathing is a very controversial topic in the Uromastyx community because of outdated myths. Rumors about bathing causing “tail rot” or other ailments have made the rounds and are often repeated without any supporting data. For animals recovering from illness, egg laying, or extreme dehydration, the occasional and short warm bath are excellent. The primary instance to avoid bathing would be in animals suffering from or recovering from fungal infection. I do not usually bathe my Uromastyx except for females that have just laid eggs. But a typical keeper is completely safe bathing their healthy Uromastyx on occasion, once a month is probably ideal.

HEAT AND LIGHT

How you provide heat and light your Uromastyx might be the most important feature of their care. Having the right temperatures and bright full spectrum lighting will ensure that your animal can function properly on a physiological level. When your Uromastyx has all of its physical needs met it is more likely to be relaxed and low stress which leads to a longer, healthier life and a better relationship with its owner.

Uromastyx ***require*** a basking zone of between 120-130 degrees Fahrenheit. Some individuals will prefer things a bit warmer or a bit cooler, hence why I give a 10 degree range in temperature. Be responsive to your animals and adjust bulb type and power accordingly. Like other diurnal reptiles some form of heat lamp or lamp combination is perfect for this purpose. Because of regional differences in local temperature, you will need to use a thermometer or temperature gun to measure the effect of different wattage bulbs or bulb combinations. You are likely to need more than one heat lamp to achieve the proper temperature ranges. Halogen spot and flood lights tend to be the best bulbs to use for heat. Be ***responsive*** to your reptiles. If an animal is basking for prolonged periods of time it would be wise to increase the basking temperature. If it avoids the basking zone a reduction in temperature might be in order. A common mistake when providing a basking site for your lizard is to place a high powered spotlight over one end of the cage that projects a small point of light that reaches the desired temperature. This is grossly inadequate, can cause a thermal burn on your animal if used improperly, and will likely result in downstream health issues if the lizard is forced to endure it for too long. The goal is to provide your Uromastyx with a large area of heat that reaches ideal temperature so that the entire body of the lizard from tip of nose to end of tail can bask completely. Ambient cage temperature should range from 85-92F and the cool end of the enclosure between 78-82F. For newly imported Uromastyx and animals adjusting to a new home, I recommend keeping the cool end of the enclosure no lower than 82F. The combination of stress of moving or importation coupled with access to cool temps can result in a prolonged adjustment period.

For Ultraviolet light I use Arcadia T5 HO 14% Desert UVB bulbs for my Uromastyx. Other high output and high rated UV bulbs made by other reputable reptile brands will also work well. The UV light should run nearly the full length of the enclosure to spread both visible light and UV throughout. Follow the instructions on the packaging with regard to distance of the lamp from the animal because the recommendations will vary by brand. It may seem trivial but distance from the animal is important. Some bulbs can be harmful if placed too close to the lizard. Offering a few places in the cage where your lizard can relax without being under UV is also necessary. If you live in the right climate outdoor housing might be possible even if for only portions of the year. I do not have experience keeping my Uromastyx outdoor and thus can't speak to the methodology.

One very common complaint in the reptile community is the unreliability of name brand reptile specific heat bulbs. While you can usually depend on UV light bulbs to last until they need to be replaced (their UV output degrades over time of use, usually needing to be replaced every 6-12 months depending on brand) it can be an ongoing challenge to find heat bulbs that are sufficiently bright, hot, and resilient to burning 14 hours a day every day. At this time I use either PAR30 Halogen flood lights of various brands bought at hardware stores or online or any kind of name brand reptile basking bulbs. My needs are such that availability can dictate what I use. Flexibility is very useful when solving the issue of lighting and heating.

Night time heat is not necessary for Uromastyx unless your home dips below 62-65F at night time in Spring and Summer. If this is the case, under tank heating pads or cables can help keep the cage temperature slightly warmer overnight.

DIET

Uromastyx are primarily herbivorous. Your geographic location may play a major role in what food you can obtain on a consistent basis. Thus the type of greens and amounts you can purchase can be very different from store to store and state to state. Thankfully there is a wide variety of greens and vegetables that can be fed to Uromastyx. Both fresh and prepared foods should be included on the menu. I use the resource thetortoisetable.org.uk as a guide when exploring for new plant foods to offer my animals.

The list of fresh greens that I offer my animals includes but is not limited to: Endive, Dandelion Greens, Belgian Endive, Turnip Greens, Escarole, Collared Greens, Treviso, Raddichio, Green Leaf Lettuce, Romaine Lettuce, Kale, and Arugula. I search for these plants first and as backups or plants that I will offer less often (roughly once a week) are Bok Choy, Mustard Greens, and Cilantro.

In Spring and Summer I harvest wild plants and flowers from my mother's garden or nearby open space as often as possible. Some of these plants are: Hollyhock, Nasturtiums, Phlox, Dandelion leaves and flowers, Alfalfa, Grape Leaves, Grass, Honeysuckle, Vine-weed (leaves and flowers), and Squash flowers.

Other veggies and treats that Uromastyx usually enjoy are: Butternut Squash, Acorn Squash (a favorite of my animals), Peas, Carrots, Green Beans, Bee Pollen granules, Lentils (both dry and sprouted), Timothy Hay, Finch Seed Mixtures, and Spine-less Cactus. It is easy to get carried away with these foods in particular, but I suggest you limit these offerings to no more than 2-3 times per month due to their relatively low nutritional value. Bee Pollen is an excellent way to get diverse nutrition to your lizard, but should also be limited to infrequent feeding precisely because of its very rich content. I don't feed Bee Pollen granules to my Uromastyx, but giving them a small spoonful 1-2 times a week is just fine. Seeds and lentils are very common treats for Uromastyx although I only give mine access to either a few times a year, usually in late spring and early summer. Again it is important to ***exercise restraint*** when feeding treat foods or dry foods. As a general rule 90% of the diet of my Uromastyx is fresh greens and flowers. 5% of hard veggies or treats, and 5% dry foods.

Greens and plants can be chopped up or grated and placed in a shallow food bowl or on a bare slab of tile or stone. I scatter Timothy Hay around my enclosures both as a dry snack that Uromastxy graze on but also as a kind of visual barrier. Every other month or so I put fresh hay on and around select hiding spots in the cage. This can sometimes make cleaning a bit more of an effort, but the animals love the snack and often will dig around in the hay for fun or to find more food.

There are dozens of different brands of calcium and vitamin supplements for reptiles

on the market and most any of them can be used for Uromastyx. I used to follow a limited supplementation regimen for my animals because they get high quality full spectrum UV lighting, frequent exposure to natural sunlight in warmer months, excellent temperature gradients, and a highly varied diet. However in recent years I have noticed a need for more supplementation in their diet. For 2 seasons I saw prevalence of easily damaged eggs and reduced egg viability. These concerning changes drove me to make a change in the way I think about supplementation for my animals. I now offer both calcium and vitamin supplementation on insect treats whenever I feed them as well as on 2 feedings of greens each week. When I see pairs begin to mate during breeding season I start adding extra calcium and multivitamin to their treats to give them an extra boost while producing eggs. This usually is in the form of Miner-All Outdoor Formula by Sticky Tongue Farms and any reptile multivitamin powder, almost any brand of quality calcium and vitamin supplement is sufficient. Be sure to follow the instructions on the packaging as suggested use will vary by brand.

Dry foods are a great way to add more variety to the diet. These foods can also be a helpful way to counterbalance the high water content of the fresh greens, which doesn't resemble their wild sources of food. Some good dry foods to choose from are: ZooMed Grassland Tortoise Food (offered dry or soaked and crushed into small bits), Mazuri Herbivorous Reptile Diet (dry or soaked), Rep-Cal Juvenile Iguana Pellets, and other comparable grassland/desert diets made by other brands. Currently I prefer using Mazuri Herbivorous Reptile Diet and Herbal Tortoise Hay by TortoiseSupply.com for my Uromastyx.

I feed these to all sizes of Uromastyx in varying amounts except hatchlings under a few weeks old, reducing its frequency or completely halting it in the cooler seasons. I crush or grind the pellets with a coffee grinder and put them in a small dish for the animals to free feed from at their leisure. During Spring and Summer the adults have access to this food almost every day and often run over to grab some as I refill their bowl. For babies under 4-6 months I grind the ZooMed Grassland Tortoise Food into what is essentially a powder, mix in a little calcium and multi-vitamin, and leave it in a bowl for the whole clutch to share. All species of baby Uromastyx I've hatched really love this mix.

An important consideration in offering these dry foods is the time of year/season. For example if your region is nearing winter it might be best to hold off on too much dry food to allow your Uromastyx to get as much hydration as possible in advance of winter. Another consideration is trying to limit dry foods offered (unless pre-soaked) to gravid females. At a time when the demands on the lizard's body are high, processed and dry foods might be a bit too taxing on an already hard working system.

Insects are an extremely controversial topic in the Uromastyx keeping community. This controversy, like the water bowl or bathing topic, is completely unwarranted. Insect foods in limited amounts are not harmful. When I first published this care guide I believed Uromastyx had no need for insects in their diet. I have changed my mind on this topic in the last 2-3 years. After years of not offering my animals any insects, I walked through my shop with super worms as a treat. Every single animal, wild caught, captive bred, old and young (the sole exception being 1 old male U. thomasi) went absolutely wild for the treat. It is undeniable that many Uromastyx love insect food. In years past I have observed several of my animals chase down spiders that have gotten into their pens! If you choose to offer insects to your Uromastyx stick to mealworms and superworms and aim for 1x per week feedings for youngsters and 2x a month for adults. I've seen very positive changes in the overall health and mental state of my Uromastyx since reintroducing insects into their diet. These also have turned out to be great tools to build trust between me and some of my more skittish individuals because their desire for the super worm typically outweighs their fear of me. Much dry and processed foods I strongly suggest using restraint when feeding insects. It's extremely tempting to feed them often because of how fun it is to watch and how much the animals seem to love them, but less is more.

SEASONAL CHANGES

Like a majority of reptiles, Uromastyx will have variations in behavior guided by the seasons. If you are striving to breed your Uromastyx these changes are a necessary part of the process, but even if you don't plan on breeding it is almost a certainty that your animal will change behavior in Fall and Winter, so being prepared is important and will help keep

worries around the changes to a minimum.

Winter cooling (often called hibernation or brumation even though each term has a specific definition) is the reduction in activity exhibited by these lizards during the Fall, Winter, and very early spring seasons. Uromastyx of almost all ages go through this natural cycle every year. While easy to identify and understand, the sudden change in behavior can be understandably worrisome for new owners. Reduced activity, appetite, and bowel movements resemble what we often think of as red flags indicating a problem. But rest assured this is a natural and safe change. Very often at the first significant drop in temperature in Fall Uromastyx will slow down substantially. They often reduce their amount of daily basking activity, feed less (sometimes not feeding at all for weeks), and defecate less. Some animals stop coming out entirely and stay hidden for months. Losing some amount of belly weight is completely normal and shouldn't be cause for alarm. If your animal is losing weight in the legs and tail that should be taken as a sign that something is wrong and a vet visit may be in order.

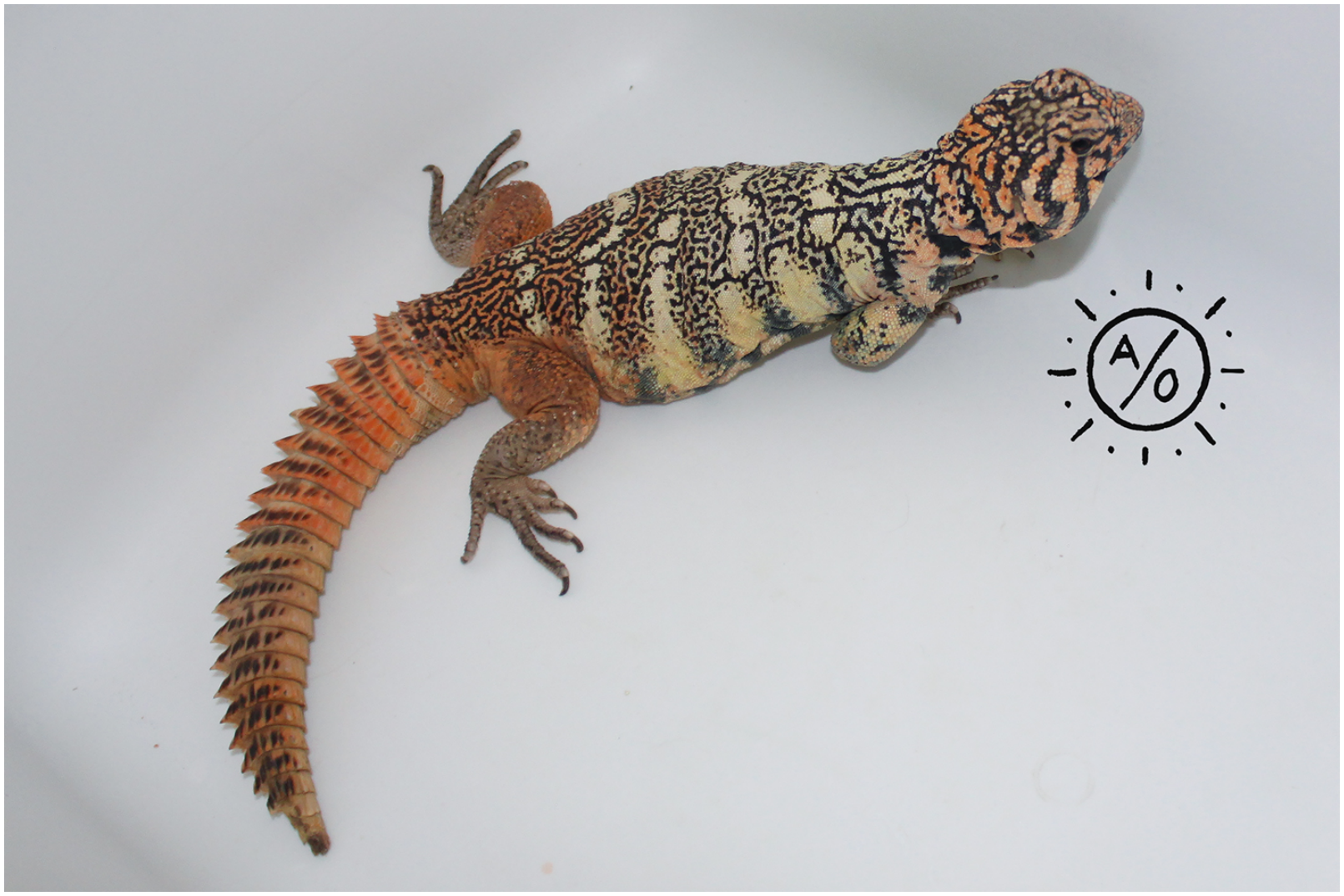
My Uromastyx usually begin reducing activity in mid-late September and by late October the vast majority of them are barely coming out to eat, bask, defecate, or explore. In conjunction with the natural seasonal changes here in Colorado I also reduce the daily photoperiod for the animals. Starting in October when they start to slow down I take 1 hour off the running time of the lights every week until they are on from about 9-10am until 4-6pm. It's important that basking opportunities are available in case the lizards need to access heat to digest any remaining food in their gut. Even if you don't change the

photoperiod for your Uromastyx it will very likely still go through all of this change in activity. It's best not to disturb them during this time, but an occasional check is not a problem. Some of my young Uromastyx even appear to grow during this period, emerging in Spring a good amount larger than when they disappeared for Winter.

As Winter draws to a close I reverse the photoperiod for my lizards by increasing the length of time lights are on by 1 hour every week until the lights stay on for 12-14 hours a day. In 2020 and 2022 I noticed a large number of my Uromastyx emerge and become active again immediately after the Winter Solstice. At the time of this update, early September 2023, almost a dozen adult animals are already slowing down in advance of Winter. Usually by late January or early February almost all of my animals are back out basking and ramping up for the coming Spring. Some seem to be on their own internal schedule, not slowing down at all, some go under for up to 6 months, some youngsters are active all Winter only to slow down during the peak of Spring for 6-8 weeks. Each animal is slightly different and should be allowed to freely engage in it's own cycle.

If your Uromastyx does not slow down for winter, that is also normal. Each animal is unique and will behave according to its own instincts and interests. Being responsive and flexible will help your lizard to make any changes with ease and confidence. Once you've had

your Uromastyx for a few years the Winter changes will seem totally normal and routine. You may even plan vacations around when your Uromastyx is asleep for winter in order to reduce the need for a babysitter!



HANDLING AND ENRICHMENT

Uromastyx can become extremely friendly and interesting pets given enough time and patience. The emphasis here is on ***patience***. Change is very stressful for these lizards and shipping, delays, cool temperatures, new cages, sights, sounds, smells, and food are more than enough to dramatically change their behavior. Only patience will help you develop a bond of trust with your Uromastyx that can be rewarding for both of you.

If you've just received your Uromastyx and he/she is flighty, leave him/her alone! It's very important that your Uromastyx feels comfortable in its enclosure before being subjected to bigger stressors like handling, hand feeding, and more. Many new keepers are over excited about their new addition and, understandably, want to handle or interact with it right away. Some are lucky enough to get an animal that for whatever reason is not phased by the change in homes, but many will be discouraged by receiving a captive bred Uromastyx that is instantly skittish. Remember that Uromastyx can have life spans of 30-50+ years in captivity. An animal with several months or a year of shy behavior is nothing compared to the reward of a long life of friendly interaction that will grow out of patience and repetition.

Many Uromastyx can be skittish at first, running when you enter the room. Blocking certain views of the room with paper can help them relax a little. Usually when given enough secure hiding spots they become much braver. If that doesn't work give them all the time they need to not run when you enter the room, then gradually get closer to the

enclosure more and more often. Stay vigilant with this practice and eventually the animal will be fine with you opening the enclosure to feed or clean without running. It's worth noting that because I have so many Uromastyx that regular handling is not a part of my routine. I prefer to just observe them or hand feed. But even the most skittish animals eventually get accustomed to my presence and allow me to perform normal maintenance without fleeing. Once your lizard is comfortable with you opening the enclosure you can start using other methods to bond with your Uromastyx. Hand feeding with food or treats is a great way to build trust. Many keepers use high value treats to help encourage a strong response from their animal. Treats like bee pollen, mealworms, ground tortoise chow, sprouted lentils, and wild flowers are excellent options for this practice and usually elicit a strong response. Through the practice of hand feeding the animal will learn that you mean no harm and eventually become very accustomed to your presence.

Hiding food or making it difficult to reach, creating interesting exploration opportunities within the enclosure, offering multiple hiding areas of different types and microclimates, and occasionally allowing supervised interaction between animals are all great ways to bring more happiness to your pet. One of my favorite things to do is to let them see that I've got a favorite food in hand. Once they run for the food I hold it up higher, making them work harder to take bites. Placing that same food in different places in the enclosure so they either have to find it or stumble upon it when exploring is another fun game. Another common method for changing the presentation of food for your Uromastyx is to hang greens from a string or strand of metal. The food is hung in such a way that the Uromastyx will have to use different skills to reach as the plant gets further and further away. Be creative! There are many ways to enrich the life of your reptiles and surely more to be revealed as more and more is learned about reptilian psychology.

Seasonal changes/fluctuations in temperature, humidity, and food availability is important for mental and physical well-being. Night time drops in temperature are as important as rising temperatures during the day. These lizards evolved to experience these changes in the wild so they should be provided. Even though Uromastyx are desert reptiles, their burrows are much higher in relative humidity than the surface. Providing a humid hide as mentioned in the "Housing" section is great for almost all desert lizards. During the winter months in the wild it is likely that foods would become scarce. To mimic this in captivity I change the diet of my Uromastyx in Fall and Winter. When October rolls around I drop the diversity of food offered dramatically, usually only feeding small amounts of Green Leaf Lettuce or Romaine Lettuce and only once a week or so. Then when my Uromastyx are waking up, usually in January and February, I start adding in more and more variety. These changes in type of food and availability of food are strong signals of seasonal change to Uromastyx, just like the change in temperature and photoperiod.

Exposure to natural sunlight is one of the very best things you can offer your pet reptiles. Only do so when weather is ideal and avoid taking your Uromastyx outdoors in temperatures below 70F. When doing so ensure that the animal can easily escape the sun if needed and cannot escape it's outdoor enclosure!

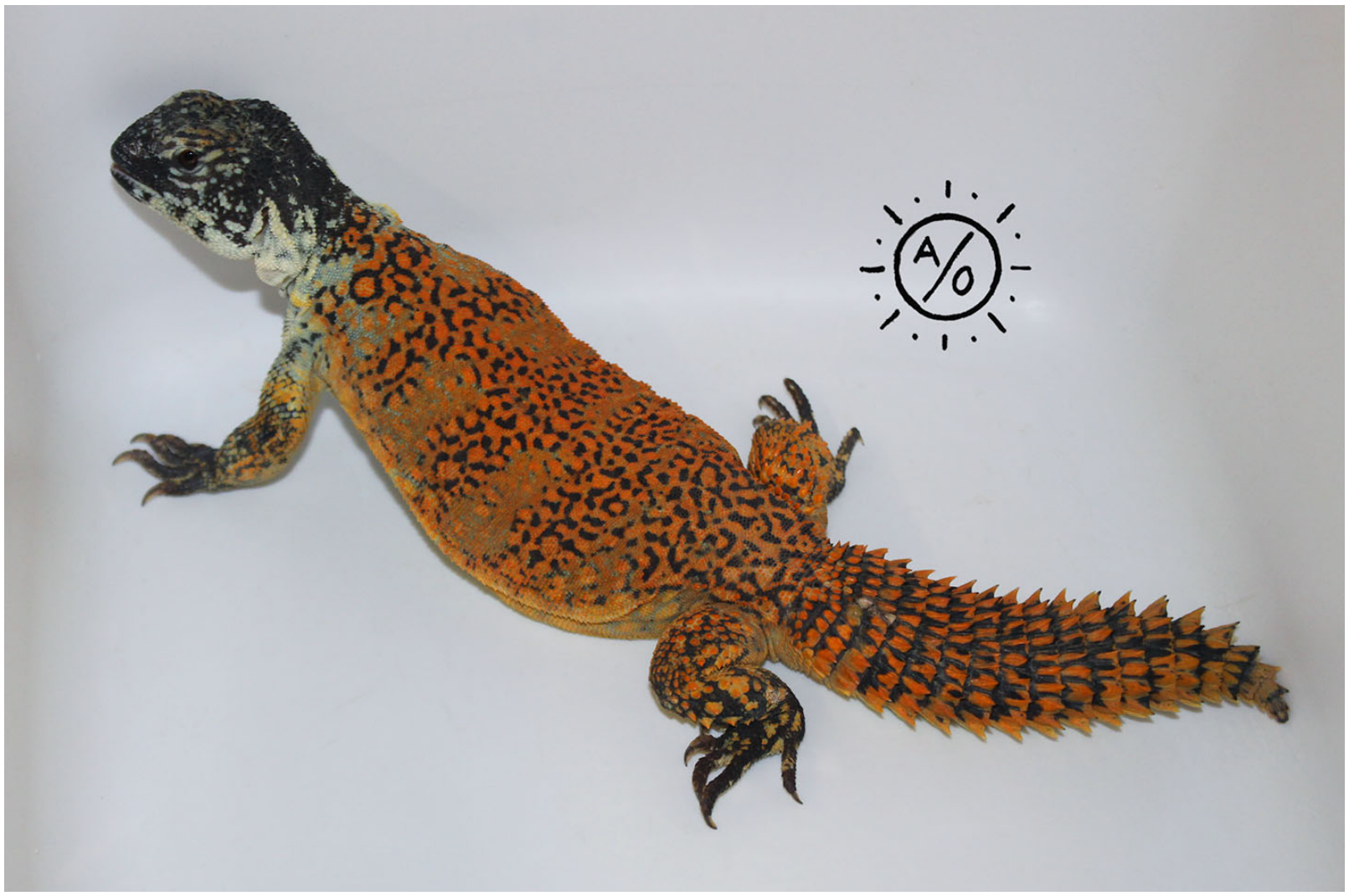
Novel food items, the chance to explore new terrain, the challenge of solving problems, and the ability to engage with interesting objects are all ways of bolstering the mental health of captive Uromastyx.

Allowing your animals to interact with members of their species on occasional supervised visits is a vital aspect of their ability to thrive. Make sure neither animal can be injured in the visit, do not leave them unattended for safety's sake, and keep visits infrequent to reduce stress from introduction into a new space. I use a piece of plexiglass to keep between animals that I want to ensure won't fight. Most of the time I let males or females interact with each other, but sometimes I let two males attempt to fight with the plexiglass barrier. Also on occasion I will do the same with a younger animal and an older animal. This is by no means required but is something I practice.

TROUBLESHOOTING: WHEN TO SEEK VETERINARY CARE

Just like with dogs, cats, hamsters, or horses your Uromastyx will need veterinary attention at some point in its life. While a dog or cat can tolerate visits fairly well, a Uromastyx is going to experience a great deal of stress if it has to be taken to the vet. If you keep reptiles you should have the information on hand for a qualified exotics vet, and if not do your best to find one even if it's a long drive away. This can save your pets life and shouldn't be avoided.

A few abnormalities that require a visit to the vet are: consistently loose or runny stool, blood in the stool, external injuries like cuts, burns, and abrasions, any swelling of the limbs/digits/eyes, difficulty in passing bowel movements, labored breathing, discharge around the eyes/nose/mouth, build up of crusty substance around the mouth, buildup of fecal matter around the cloaca/vent, or difficulty moving or walking normally. Unfortunately most ailments have their root in husbandry mistakes, but some are just accidents. All the more reason to properly prepare and work hard to give the best care to your Uromastyx from the start.



It is my opinion that veterinary care for reptiles should be as common and simple as it is for dogs, cats, and other more common pets. It is an unfortunate reality that some exotic veterinarians are only generally informed about reptiles and often ignorant of Uromastyx specifically. This is not their fault! Herptiles are extremely variable and different, it would be impossible for any one veterinarian to be fully prepared to care for any and all reptile problems. Depending on your region it may be difficult to locate an exotics vet. Any vet is

better than none at all, so even one that doesn't know much about Uromastyx specifically can be extremely helpful and will have ways of finding out more information.

Most people are unfamiliar with reptilian body language and typical behavior, and sadly Uromastyx can't simply tell us when something is wrong. Spend a lot of time observing your lizard and get to know its habits and quirks. This will help in the future to determine if your animal may need to visit the vet. There may be cases when a vet visit is not required. Much like other animals loose stool can be caused by temporary stress or the introduction of new foods. If your animals has loose stool once in a while, perhaps 3x a month, and is otherwise behaving normally, a vet visit probably isn't necessary. Due to the high water content of the greens we feed these animals it's also not uncommon to have normal stool with a lot of excess liquid waste combined. I often offer a little extra dry food to my Uromastyx when I see this, mostly just to make cleaning easier for me! Once you're confident and familiar with your individual Uromastyx use your best judgement when deciding when and if it's time to see a vet.

THE FUTURE: POPULARITY, MORPHS, PHENOTYPIC REFINEMENT

As I stated in the Introduction to this guide, Uromastyx are increasing in popularity in the U.S. Herpetocultural trade. Many forces seem to be working in their favor. Most species

are not too large in size, most can make phenomenal pets, they have long life spans, a simple and affordable diet, tolerance to beginner error, and an incredible array of stunning appearances. Even though wild caught imports have been the norm for decades, captive bred animals are increasing in number to meet the demand. Along with the upsides of their care requirements, Uromastyx have other notable positive attributes. Most Uromastyx take 3 years ***minimum*** to reach sexual maturity, only produce once a year (except for a few species that can occasionally double clutch), and have a modest clutch size of between 6-25 eggs. Many individuals won't produce every single year, taking the odd season off from breeding. This rate of reproduction is slow enough to help prevent their overabundance in the pet trade, a reality of other species that have reached very high demand.

While a diverse range of species are present in the U.S. and I think this is ideal, it is my belief that there are only two species that have the ability to reach both long term stability and larger scale popularity. Uromastyx ornata and Uromastyx geyri have the best mixture of circumstances to become Herpetocultural icons. Both species are resilient and forgiving of early mistakes by pet owners. Both species are ***brilliantly*** colored and easily learn to trust their keepers. Both species not only have a large presence in existing breeding colonies (something no other species of Uromastyx can claim as of yet), and both are still somewhat regularly imported from the wild. The existing importation of both species means focused efforts can still be made to obtain a substantially genetically diverse colony before importation halts, something that has happened over and over again within Uromastyx specifically. Ornate Uromastyx are easily the most visually diverse and astonishing members of the whole genus and lack the uniformity of other species in terms of color/pattern. Both U. ornata and U. geyri are extremely brightly colored on average and males of each species can be breathtaking. Every species of Uromastyx has it's place, I am not suggesting otherwise. However all other species have either too few founding animals to make long term propagation sustainable, they lack the broader appeal and accessibility to larger audiences, they are large in size and require substantial space commitments, or a combination of all of these factors. U. d. flavifasciata, U. d. maliensis, and U. nigriventris are notoriously vicious with one another as hatchlings, some causing catastrophic injury to their siblings forcing breeders to keep clutches of 20+ animals individually which can be space and cost prohibitive. Other species such as U. yemenensis, U. princeps, and U. thomasi have great personalities and do well in moderately experienced homes, but have nuances in care that prevent them from being kept by a larger cohort and populations small enough that it encourages the few that produce them to be stingy about who they sell them to.

There is no domesticated pet animal that does not have within it's population a diverse set of morphological forms. In the case of Uromastyx, a lack of diversity in available species might eventually be replaced by a diversity of forms in a few species. Strong division exists

on the topic of morphs in the Uromastyx community in particular. There is no reason at all why we can't have both wild type and mutated Uromastyx in the pet trade. There will always be a demand for ***both***. There is no virtue in holding to a wild standard in a captive population that will never again see the wild. There is also ethical risk in pushing genetic mutation for it's own sake and without responsible management. Herpetoculture contains a heated and interesting debate around the pros and cons of the "morph market". This debate is completely justified, but it is my opinion that we can have our cake and eat it too.

At the time of this writing, I am aware of just a handful of genetic mutations present in Uromastyx as a whole. Only 3 have been proven out but more are sure to follow. Not all genetic mutations are created equal and anyone breeding animals should halt the propagation of any mutation that causes health problems for those animals. Novelty alone is not enough to justify the continuation of a specific mutation. If morphs are to be a part of the future of Uromastyx, which I believe is inevitable, keepers and breeders need to learn from the mistakes made in the pursuit of morphs in other reptiles. Broader trends in Herpetoculture as a whole coupled with the unique qualities and biology of Uromastyx place them in a unique position to set a new example for what a domesticated reptile can be.

Selective breeding in an effort to refine a specific look or color has great potential in Uromastyx. Even in species that have a great diversity of appearances (I have ornata in mind here), selective pressures will eventually yield various looks. As with genetic mutation, the health and well being of the animals should always remain the top priority.

Once a producer, community, family, or individual has committed to a species, attention to management of that species must be paid. Herpetoculture in general suffers from lack of oversight/accountability, poor record keeping practices, and hyper competitive niches that fracture attempts to collaborate on important projects. When a seller claims "these are unrelated" or "I got these from source x" in many cases we are forced to take their word for it or pass on the opportunity. Competition resulting from a scarcity mindset can drive keepers that could otherwise work together to wage a kind of cyber turf war with one another. I don't claim to have solutions for these concerns and remain open minded to what shape the future might take. One step in the right direction at a time.

RESOURCES

Remember that the mind is like a parachute and only works if it's open! Never stop learning about your reptiles. Regularly question and update your notions about how to care for your pets. Seek out conversation with friends, have challenging discussions with those you disagree with, encourage the success of others, and strive to do better every day.

Here are some useful research tips:

1. Read more than one care sheet or resource article! When using the internet as a tool

for research it is important to soak up as much material as possible. Simply settling for the first care sheet that shows up in a Google search is not sufficient. Especially with Uromastyx a variety of information is important, there is quite a bit of misinformation out there.

2. Look up wild photographs of Uromastyx. Seeing the animals in their natural habitat is an amazing resource provided by photography and the internet. Utilize this tool!

3. Ask questions of friends and more experienced keepers and be open to suggestion and criticism! Most of us that keep Uromastyx love to talk about them and have no problem offering help with specific questions for new and soon to be keepers.

4. Be kind, courteous, and respectful to both legendary keepers and brand new enthusiasts alike! As human beings we gain strength through community and Herpetoculture is no different. Much of what I've learned over the years has been thanks to friends near and far. Having a kind demeanor and and open mind is the best way to learn quickly.

5. If at all possible one of the most valuable ways to learn about a reptile is to visit its natural habitat to observe. Sadly for most of us this is not in the cards. But if it is something possible for you very few things will teach you more.

6. Pay attention to adjacent industries and practitioners. There are innumerable cross compatible methods between herpetoculture and other animal fields. Bee keeping, koi breeding, large scale farming, small scale artisanal craft, things you might not ever think of applying to a Uromastyx can offer insight and new ideas. And if nothing else, this is just good practice for being an experienced person.

Here is a list of valuable resources to explore. Some of these are informational resources and others are places to find available Uromastyx and others that love this amazing group of reptiles.

Facebook Groups: Uromastyx Club, Urobook, Exclusively Captive Bred Uromastyx
Websites: I've compiled a solid list of good websites on my Arids Only website www.aridsonly.com (click 'resources' from the menu). Using Google Images, Flickr, and iNaturalist to explore photos of Uromastyx in the wild is extremely useful.
Books: Uromastyx: Natural History, Captive Care, and Breeding by Thomas Wilms, Uromastyx: Plus Other Common Agamids by Advanced Vivarium Systems.
Videos: My YouTube Channel is an ongoing project with a mixture of videos on the topic of Uromastyx and can be found by searching for my channel titled "Arids Only". It is also worth watching the numerous videos of Uromastyx in the wild available on Youtube and other platforms.