

Help for the Common Herper

by Allison Blankenship



Helpful Information for
Herp Keepers Who Don't
Know All the Latin Names
(and for Those Who Do)

Second in a Series:

Selecting Safe Substrates

When you're a wildlife educator, there are certain facts of professional life: cages always need cleaning, audiences aren't always polite and everyone always wants to show you their animals. Almost every weekend, a glowing birthday child takes me by the hand and proudly drags me to their bedroom to admire their prized pet store herp. Unfortunately, what I often find is not pretty: a limp leopard gecko, an emaciated baby beardie or (my ultimate horror) a yellow-tinged iguana hatchling.

Oh, you get to see it all. That 10-gallon aquarium is outfitted with every gadget the pet store could sell to the enthusiastic parent. There are waterfalls and cut-away hide box caverns. There are those dreaded hot rocks and food bowls that jiggle (so the can-o-crickets appear to be alive). And then, there it is...that \$9 bag of fancy substrate. There's the hot-pink calcium sand, the crushed walnut shells, the crumbled corn cobs or "the parasite-free" jungle mulch. How *do* you match substrate to room décor? Or, better question, how do I tell these parents that the expensive, clerk-recommended substrate might be killing their child's pet?

Substrate - Not As Innocent as It Looks

Choosing the wrong substrate for your amphibian or reptile can be the kiss of death. Accidental substrate ingestion is an all too common killer. Any lizard or snake that "smells" with their tongue can accidentally swallow pieces of substrate when it sticks to their tongue. Any herp can accidentally swallow substrate when they are in a feeding frenzy or if the substrate easily sticks to their dinner. Ingested substrate can puncture or abrade the gut lining, causing perforation, inflammation or sepsis. And, if the substrate clogs the GI tract, it causes a critical condition called "gut impaction" - resulting in either an expensive, invasive emergency surgery or a slow, painful death for the animal.

Ingestion isn't the only danger. Some particulate substrates can stick to the hemipenes during copulation or to cloacal tissue when everted during defecation. The substrate can then be taken back up into the body when the tissues are retracted (ouch). This can cause irritation, inflammation and sepsis. In juveniles, these cloacal blockages can cause death.

Particulate substrates can also be abrasive, harming delicate skin, bellies and feet. It can irritate eyes or scratch the eye coverings of herps with no movable eyelids, causing eye infections or permanent injury. And, they can abrade the mouth - setting up ideal conditions for mouth rot (ulcerative stomatitis).

Another substrate risk is that clumps of feces and urates can mix with litter and get buried. Over time, these clumps grow bacteria and mold which can then be ingested, inhaled or find its way into cuts or body openings - all resulting in inflammation and infection.

Now, add the risk of possible substrate contamination - bringing parasites, bacteria and fungus into their home isn't much fun for your herp either. Choosing the right substrate is not a matter of room décor -- it can mean your animal's survival.

So, how do you select a safe substrate?

First, don't ask a pet store clerk. More often than not, they will steer you to whatever is on the shelf and read you some very impressive product claims right off of a fancy label.

Second, don't trust those fancy labels. Marketing 101 says that neatly printed safety claims (especially when paired with cute pictures of turtles, snakes and lizards) influence purchasing decisions. The pet care industry is not regulated. You can claim anything, if there is no one to challenge you. Ask any exotic veterinarian about the safety of some of the most advertised substrates and they'll dispute those safety claims with some pretty gruesome patient case studies.

The answer is simple. Research the climatic needs of

each herp species in your collection: moisture-lover, dry heat basker, sand burrower, etc. Then, look at all possible substrate options, compare them, study the pros and cons of each and select a substrate using your own good judgment as a well-informed herp keeper.

So many substrates...so little time.

Too much to digest (no pun intended)? Here's my favorite quick method to assess the safety of a substrate. Ask yourself: *Would you let your 2-year old child eat his food directly off of that substrate?* Enough said.

In case you're looking for a more detailed analysis, here's a listing of some of the best and the worst substrate options, as reported by reputable herp experts. (Note: To ward-off threatening letters from manufacturers, I have purposely avoided using actual product names.)

Never, ever, ever...

Reptile Bark Nuggets – NOT a good substrate, especially for iguanas and other large lizards. (Yes, I know the bag says "It's the #1 choice of iguanas!") It may look naturalistic and pretty, but it's too easy to swallow while gulping down food. Many vets have had to cut this wooden stuff out of herp tummies. Also, even though the bag says "all natural," you have to question why it stains the bellies of any animal that crawls on it, turning them a funky red-wood color. Expensive and messy to change, hard to keep clean, not a good heat conductor and leaves a residual red dust.

Calcium Sand – Pure marketing genius. This stuff claims to be "easily digestible and a source of much needed supplemental calcium." If this were true, then why are you able to see wads of the stuff through the bellies of dying, gut-impacted leopard geckos? Not the sand? Hum, black calcium sand, black mass in belly. Hot-pink calcium sand, hot-pink mass in belly. No coincidence to the vets who've seen this far too often. One researcher tried to dissolve calcium sand samples in various basic and acidic solutions (everything from plain water to hydrochloric acid) and after 4 days of soaking, nothing was able to dissolve this stuff. And, just to further insult our purchasing intelligence, you can now buy "glow-in-the dark" calcium sand.

Cat Litter – What, are you kidding? Gut impactions, respiratory distress from dust, abrasions to feet and bellies,

rapid dehydration – and imagine ingesting those "scent crystals." I had a client ask me if the clumping kind of cat litter was any better. How do you respond to that?

Corn Cob Litter – Just because it is "natural" doesn't mean it is safe. These crumbled corn cobs tends to swell if swallowed, causing immediate gut impaction. This substrate is also linked to frequent reports of mite contamination. Holds moisture very well, making it a great culture medium for mold and bacteria – if that's what you're keeping.

Walnut Shell Litter – Looks pretty, but the edges of each piece can be sharp and abrasive and it can be dusty. Originally marketed to the avian industry, bird breeders have stopped using this stuff because it quickly grows mold and bacteria under the surface when moistened or soiled. Perhaps that's why the walnut shell recyclers have repackaged it for the herp industry.

Cedar or Pine Shavings – No way. Cedar contains volatile oils that can harm skin and generate fumes that permanently damage the respiratory system. *Never* use cedar. Pine shavings (a former herp industry standard) are now also accused of being harmful to small mammals, although not yet proven in herps. There are better options.

Some Pros, Some Cons...Use These Intelligently

Reptile Mulch – Pros: holds moisture well. Cons: easily ingested, dusty, requires frequent total change-outs, messy and expensive to change. Be sure to use cypress mulch – *never* use cedar mulch, as it contains harmful phenols which are toxic. Most reptile mulches claim to be "parasite-free" -- well, it may have been when it left the



Cypress Mulch

manufacturer. Be aware that any substrate can quickly get contaminated by mites, bacteria or fungus once it enters the warehouse or pet store showroom – especially when it's moist and dark, like in these bags. True story: I got a panicky email from a client who said their ball

python was losing scales, leaving little white spots, but that the cage was clean because he just changed the mulch 2 days earlier. I had him go look closely at the

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mulch for crawly critters. Sure enough, he found his “fresh mulch” was infested with red ants.

Potting-Soil/Peat Moss Beddings— Great for moisture-loving arthropods and burrowing amphibians and reptiles. Since it’s basically dirt, impactions are still possible, so feed in another tank to minimize ingestion. Requires frequent wetting to stay moist or it can quickly turn to a crumbly powder and dry-out your tunneling species. Also requires frequent, messy change-outs. The pricier pet store “bricks” of bedding are acceptable, just be sure to check the ingredients list and buy only soil and peat-based beddings – avoid the compressed coconut fiber stuff. If buying from a garden center, be sure to purchase “organic” potting soil or soil/peat moss mixes (no added plant foods, chemicals, vermiculite, perlite or additives). If it’s not marked “sterile” (or you don’t trust where the bag may have been), then sterilize it yourself before use to kill all parasites and pathogens (bake at 160°F for 40-minutes). Never use soil from the outdoors.

Cypress Much/Potting Soil Combo – A do-it-yourself mix that offers all the best features of both reptile mulch and potting soil (above listings) and seems to be the best combo for moisture-loving burrowing species as the mulch helps to prevent surprise dry-outs. When mixed with water, heat and feces, nasty bacteria and fungi can thrive -- so frequent, messy change-outs are necessary. As always with particulates, feeding in another area is recommended to prevent accidental ingestion.

Sphagnum Moss – Good for amphibians and reptiles requiring a microclimate of higher humidity or for use in humidity boxes – just moisten and keep damp. Some reports of fungal infections, so replace it often or periodically dry it out to kill fungal spores (bake in 250°F for 1-hour). One source cautioned against its use due to its high acidity. Never use mosses collected from the outdoors, unless you want to keep a whole new collection of critters.

Play Sand – Some experts recommend it for desert lizards (like uromastix and bearded dragons) and I’ve seen dozens of breeders display them in tubs of the stuff. It’s cheap, retains heat well and is fairly easy to change-out or

to clean with a sifter. But, it can cling to both insect and plant dinners (you drag your salad leaf across it before eating it) and it readily clings to everted organs. Those sand granules may be small, but the edges are sharp – remember, we melt sand to make glass! Adult lizards may tolerate it better than juveniles, but it’s still not 100% safe. If your snake or lizard requires a sand substrate for burrowing, then you’ll obviously need to use it, but feed them in another tank just to play it safe.

Rocks -- Pea gravel and larger aquarium rocks can be used with aquatic herps, although ingestion is not totally out of the question. Water can also accumulate under the rocks and harbor all sorts of nasties, so frequent cleaning and rinsing is necessary to keep algae and bacteria at bay. Large rocks used in desert reptile displays may look nice, but I’ve seen a number of x-rays of Burmese and other large pythons who, for some unknown reason, decided to swallow a large rock or two. So, any exhibit rock that can fit into your animal’s mouth should be questioned. Beware of sharp edges which can also leave abrasions.

Rabbit Pellets (the kind they eat, thank you) – You see it more and more in commercial pet store herp displays. Vets report that it is usually not harmful if ingested by iguanas, turtles or other plant-eating herps since it is alfalfa-based and has high calcium and fiber levels. However, they warn that some commercial rabbit diets have unacceptable levels of protein and carbohydrates – and encouraging your herp to eat their litter is certainly not a hygienic practice.

These pellets also swell and disintegrate with moisture and, besides smelling like wet fermenting hay, they provide a marvelous medium for mold and bacteria, so immediate clean-ups are necessary.

Recycled Paper Bedding – Great controversy revolves around these fluffy gray paper curds. Some

sources report it as good for snakes and lizards. Others warn that it’s a wood product and can still be linked to gut impaction. One source claims that it’s so dusty that many reptiles develop respiratory infections within 24 hours after using this stuff and blame it as a consistent



Recycled paper bedding

cause of respiratory infections in prehensile-tailed skinks. Generally accepted is the fact that it is absorbent -- sometimes too absorbent, causing water bowls to dry up fast and animals to quickly dehydrate. As with other particulate substrates, feeding is suggested in a separate area.

Reptile Carpet – Looks nice, can be cut for a perfect fit and it's a quick change-out for a fresh one. Not easy cleaning, however, since it must be cleaned with bleach in the washer or with a pressure hose after each use. Expensive to start with, since multiple changes are needed. Carpets should not be shared between cages to avoid possible cross-contamination. Not a good choice for sharp-clawed lizards because the "loops" can catch on claws. Be forewarned that ingestion is not completely impossible, as I once watched an adult green iguana desperately trying to rip-off a corner of a green reptile carpet.

Artificial Grass or Astro turf – All the same pros and cons of the reptile carpet (above). One of my favorite vet experts endorses this as his substrate of choice for snakes, claiming that the plastic fingers support the snake and allow air to circulate around and underneath it (thus avoiding or helping to heal skin infections) and prevents flaccid musculature and egg-binding by encouraging serpentine movement. A lizard expert warns against artificial grass, stating that the grass fibers can be so stiff that some lizards laying on them have been known to lose circulation in their limbs. Be forewarned that cut edges can also fray and unravel, allowing your herp to get tangled or giving it a between-meal snack.

Ultimately Safe, The Industry Standards

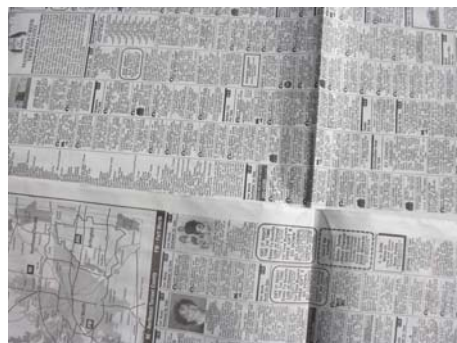
Aspen Wood Shavings – Widely used in the herp industry. Good for burrowing snakes and lizards, is absorbent, packs down well and allows for heat transmission. Should be totally replaced if soiled. Feed in a different area to avoid accidental ingestion.

Newspaper – Pretty basic, but not very pretty. Used by many herp keepers, it is cheap, fast and easy to change, readily available and quickly disposable. Because it is smooth, it's sometimes difficult for herps to get a firm footing. Be aware that ink may rub-off on an animal's feet or belly. Concerns are still reported about potential ink

fumes, although most inks used now are soy-based and non-toxic.

Unprinted newsprint or butcher paper – Looks a bit more professional than newspaper and has all the same advantages. Unprinted newsprint can be bought in large reams from newspaper publishers, moving companies or teacher supply stores. Rolls of butcher paper can be purchased from restaurant suppliers. Both are great options for large-scale breeders or keepers with a big collection. Think volume and ease, virtually risk-free.

Paper Towels – All the benefits of the other paper options, plus it's more absorbent -- and more expensive. Can be kept moist and used for amphibians, although the unbleached kind is recommended for these guys. Paper towels are especially good when treating convalescing animals. Good choice for the hobbyist with just a few animals, who wants easy cleaning and no substrate risk.



Newspaper

Do As the Zoos Do

The herps on display in zoo reptile houses are exhibited in elaborate vivariums to recreate the animals' native habitats and to please the paying public. These naturalistic exhibits are a work of art and are wonderful to admire, but they are missing the key element that is found in the wild – the decomposer invertebrates and microorganisms that break down waste and pathogens. This means that naturalistic displays require vigilant cleaning and professional herp keepers spend a great deal of time, effort and expense to keep their displays free of potential dangers. We often envision our animals being displayed at home in similar-style exhibits and this is what likely motivates us to want to buy the more naturalistic substrates.

But, visit the back of a zoo's reptile house and you'll see how the experts *really* keep their herps. The animals that are off-exhibit are kept simply: easy to clean glass, plastic or fiberglass enclosures; simple plain paper cage liners or simple soil substrates; easy to disinfect PVC "branches," plastic hide boxes and water bowls. Everything is functional and fast and easy to clean. All this simplicity helps to eliminate risk – including the risk of substrate ingestion or substrate contamination. The last zoo I worked at even pre-cut the unprinted newsprint to perfectly fit each size enclosure (10, 20, 50-gal.). Talk about

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making cage cleaning a snap -- pick-up soiled paper, wipe-down enclosure with disinfectant, drop a couple of fresh pre-cut sheets of cage liner back in—done.

The Bottom Line on Substrates

Elaborate, naturalistic habitats are a wonder to admire, but they can harbor dangers for your herp. The pet supply industry is *only* concerned with their bottom line, not the health and welfare of your animals. So, don't be swayed by glossy advertising and don't believe the safety claims of substrate manufacturers. Particulate substrates bring particular problems. If you must use a particulate substrate, feed your herp in another area to minimize risk of accidental ingestion.

It may not be what you imagined for your living room herp exhibit, but simple set-ups, simple substrates, can mean safer conditions for your herp. Select a substrate that offers the right level of humidity, shelter, heat transmission and *safety* and for your animal – and the right level of effort and expense for you. Proper substrate selection is a critical decision for the herp hobbyist and is a watermark of a professional herpetoculturist.

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