

Yes, You CAN Have an Arid Bioactive Setup!

[RSS](#)



Yes, You CAN Have an Arid Bioactive Setup!

Written by Mariah Healey, [ReptiFiles.com](https://reptifiles.com)

When you picture a bioactive enclosure, what comes to mind? Do you see a lush, miniature tropical paradise, or do you see a slice of scrub? If you're like most, then you associate the term "bioactive" with tropical species. This is because the practice of bioactive keeping started in the dart frog hobby. Given that dart frogs are tropical and very dependent on a consistently moist environment, the first reptiles to be kept in bioactive setups were also tropical. Because of these tropical associations, there is a common misconception that the bioactive concept can't be adapted to apply to arid reptiles.

While it is true that using the same “recipe” for a tropical bioactive definitely won’t work for reptiles that prefer drier, hotter conditions, if you understand the principles behind what makes bioactive “work,” then you can tweak that recipe to create a bioactive environment that is perfectly suitable for your desert-loving friend to live in. The basic principles of a successful bioactive environment are:

- Soil
- CUC
- Plants
- Moisture
- Light

Let’s look at how you can apply each of these principles of bioactivity in an arid context:

Soil for Arid Bioactive Setups

Tropical soil is rich in organic matter, needs to be able to soak up and retain moisture, and often requires a drainage layer in order to prevent the soil from getting saturated. However, if you use the same approach for an arid bioactive, it will likely end up dusty, compacted, and the drainage layer will just waste space. [That is why the Bio Dude is very happy to provide his one of a kind bioactive mix called the Terra Sahara.](#)

Arid habitats typically have a “substrate” that is very low in organic matter, but organic matter is essential maintaining a thriving bioactive over the long-term, so this is an area where some compromise must be made. If you want to have an enclosure that looks very similar to the reptile’s natural habitat, bioactive might not be the best option for you, and it may be better to go naturalistic instead.

Naturalistic = An enclosure that looks very similar to the animal’s natural habitat, but lacks a bioactive substrate and may utilize primarily artificial materials such as plastic plants and resin logs. Plants may be contained in pots rather than planted directly in the substrate.

Bioactive = An enclosure that functions as a self-sustaining, “self-cleaning” miniature ecosystem, complete with live plants and other natural materials such as real wood décor. Plants are planted directly into the substrate.

Organics such as leaf litter and sphagnum moss must be added to your soil mix in order to sustain the CUC as part of a bioactive setup.

Plants for Arid Bioactive Setups

Plants are an essential part of maintaining a healthy nitrogen cycle in a bioactive setup. They also help circulate the air in your reptile’s environment and provide fresh oxygen. In a tropical or temperate setup, plants with moderate to high water requirements and moderate to low heat tolerance thrive. However, in an arid bioactive setup, you need plants that can take lots of light, heat, and not much water:

Cacti and Succulents

- Agave (*Agave sp.*)
- Aloe (*Aloe sp.*)
- Elephant Feed (*Portulacaria afra*)
- Gasteria (*Gasteria sp.*)
- Haworthia (*Haworthia sp.*)
- Heartleaf Iceplant (*Aptenia cordifolia*)
- Hens and Chicks (*Echeveria sp.*)
- House Leek (*Sempervivum sp.*)
- Jade Plant (*Crassula ovata, argentea, C. portulacea*)
- Mother of Pearl Plant (*Graptopetalum paraguayense, Sedum weinbergii, Echeveria weinbergii*)
- Prickly Pear (*Opuntia sp.*)
- Stonecrop (*Sedum sp.* — exception: *Sedum acre*)
- Yucca (*Yucca sp.*)

Drought-Tolerant Grasses

- Blue Grama Grass (*Bouteloua gracilis*)
- Buffalo Grass (*Bouteloua dactyloides*)
- Carex (*Carex sp.*)
- Fescue (*Festuca sp.*)
- Spinifex (*Spinifex sp.*)

Tillandsia (air plants) can also do well in arid setups as long as they're kept out of direct heat and get soaked for a couple hours every week. However, do note that they contribute little to the nitrogen cycle since they lack root systems.

CUC (Clean-Up Crew) for Arid Bioactive Setups

In a tropical bioactive setup, you can use just about any detritivore for CUC. In an arid bioactive setup, however, you need to be more careful. Most CUC require lots of moisture in order to thrive, so you need to pick varieties that are resilient to drier conditions:

- arid springtails
- blue death-feigning beetles
- dermestid beetles
- dubia roaches
- giant canyon isopods
- powder blue isopods
- powder orange isopods
- mealworms
- superworms

Highly moisture-dependent CUC such as earthworms and millipedes are unlikely to be successful in an arid setup.

However, don't forget about beneficial bacteria and mycorrhizae! This is one case in which tropical and arid bioactives have something in common: as far as we can tell, the Bio Dude's BioShot soil inoculant seems to work for both types of setup.

Because of the relatively low organic content of arid bioactive setups, it's a good idea to regularly provide your CUC with food. This can be reptile-safe kitchen scraps like bits of squash and cucumber, but you're likely to get better results with a commercial CUC diet like Bio Dude Bug Grub, Arcadia CustodianFuel, and Repashy Morning Wood.

Watering for Arid Bioactive Setups

Tropical bioactive setups usually get misted once or even multiple times a day in order to maintain high humidity levels and provide drinking water to the enclosure's inhabitant(s). However, arid bioactive setups usually need ambient humidity levels that stay below 50%, so water shouldn't be added to the environment nearly as often. However, it's a mistake to let the enclosure go bone-dry. This will kill your plants, kill your CUC, and may even cause shedding issues for your reptile. So how do you strike a balance?

In the wild, arid habitats like deserts and scrublands aren't nearly as dry as they appear to be at first glance. They have to be — after all, water is necessary for life in the desert, too! Many arid reptiles depend on humid microclimates like burrows in order to help them stay hydrated. Some of these burrows can be significantly more humid than the surrounding area, up to 90-100%! When you provide access to humid microclimates within your reptile's enclosure, you can keep your reptile, plants, and CUC adequately hydrated without raising the ambient humidity to dangerous levels:

1) Keep the lower layer of substrate moist at all times. You can check your soil's moisture content with a soil moisture meter or simply by sticking a finger straight down into the dirt. To add water, you can pour water into the substrate on the cool end of the enclosure during the day so the top can dry out, but a more efficient method is using a pipe with a slot drilled in one end to deliver water directly to the bottom of the enclosure.

2) Water your plants as needed. Get familiar with the signs of dehydration in the plants that you're using, and stick to a watering schedule. Water at the base of each plant rather than all over the enclosure.

3) Create humid retreats for your CUC (and reptile!). This can be done by letting the water overflow a bit when you fill your reptile's water bowl. You can also lay down a flat piece of bark and keep the soil underneath moist.

Some people say that even a small amount of moisture outside of the water dish in an arid reptile's enclosure is a recipe for disaster (ex: respiratory infections, scale rot, etc.). However, the problem with moisture is not the moisture itself, but rather the reptile's inability to escape

from it. Just like reptiles need a variety of temperatures in order to thermoregulate, they also need a gradient of moisture levels to help hydroregulate. As long as your arid reptile has plenty of places where it can dry out within the enclosure, pockets of humidity are not a problem.

Light for Arid Bioactive Setups

Aside from halogen and UVB lamps, bioactive setups require additional, 6500K illumination to help nourish the plants and encourage healthy growth. Do you really need different lighting for an arid bioactive, though?

Yes!

Of course, it ultimately depends on the plants you're using and the type of reptile you want to house in the enclosure, but the amount of light on a forest floor or among the trees of a rainforest is not the same as the amount of light present in sparse arid environments. Arid habitats like desert and scrub have less shade than other habitats, which means that the reptiles native to these areas are accustomed to bright light during the day. The same goes for many desert plants.

This means that it's appropriate, and even necessary, to install brighter lighting in a desert vivarium than in a tropical vivarium. This is especially the case for diurnal (day-active) reptiles like bearded dragons and uromastyx.

Conclusion

Bioactive isn't just for temperate and tropical reptiles – when you do it right, it can be an amazing way to keep arid reptiles, too! Arid bioactive setups can work for bearded dragons, uromastyx, leopard geckos, African fat-tailed geckos, Sudan plated lizards, Kenyan sand boas, western hognose snakes, rosy boas, gopher snakes, and a variety of other arid species.

["African Fat-Tailed Gecko \(Hemitheconyx caudicinctus \)"](#) by [Paul:Ritchie](#) is licensed under [CC BY-NC-ND 2.0](#)