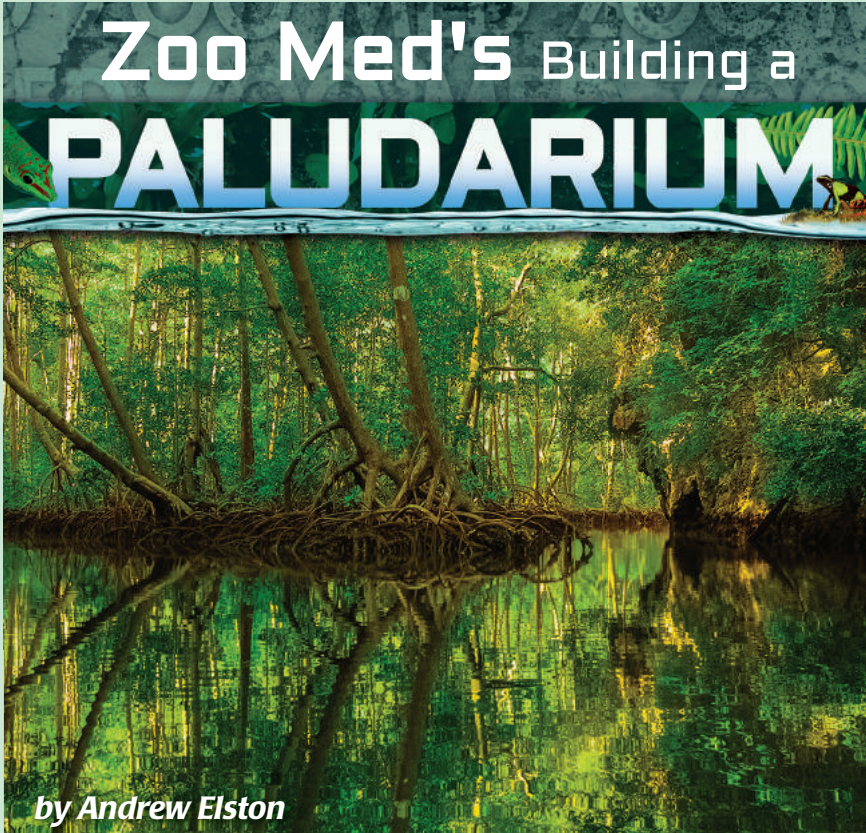




# Building a PALUDARIUM



by Andrew Elston



*by Andrew Elston*

## ***Table of Contents***

Introduction ..... 1  
 Biotopes ..... 2  
 Setting Up Your Paludarium..... 5  
 Filtration, Heating & Lighting..... 6  
 Animals & Plants for Paludariums..... 7-10  
 Difficult Biotopes ..... 10-11  
 Zoo Med Products for Paludariums..... 13-14

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## Introduction:

Picture a jungle stream, pond, lake, marsh or coastline. Along the water's edge is a unique ecosystem housing a wide variety of aquatic, semi-aquatic, and terrestrial plants and animals. To recreate this beautiful slice of nature in your home Zoo Med introduces the Paludarium! A Paludarium offers the benefit of having both an aquarium and a terrarium in one. This hybrid environment essentially combines a nano aquarium on the bottom and a terrarium on the top. Zoo Med's Paludarium line has two available sizes, a 12" x 12" x 24" Paludarium with a 4 gallon water feature and our larger 18" x 18" x 36" Paludarium with a 10 gallon water feature.

Interest in housing or recreating a natural biome habitable for exotic plants has a history that dates back all the way to the 1830s. During this time, doctor and amateur botanist, Nathaniel Ward,

transported exotic Australian plants safely back to England in the first terrarium, known as the

Wardian Case. While Ward was essentially using a scaled down greenhouse that was tailored to ship plants across the globe, it helped facilitate the interest and popularity of keeping a slice of nature in people's homes. Keeping a Paludarium goes a step further by simulating a specific biome that can house aquatic life, terrestrial or arboreal animals, and living plants all in one enclosure.



## Biotopes:

A Biotope is an area within a habitat that is associated with a particular ecological community. In other words, it is a space in the environment that is defined by all of the features that make it unique. Factors include type of substrate, water quality, structure (or lack thereof), and specific species of plants and animals. There are a number of different Biotopes that you can use to model your Paludarium after. Here, we will describe a few.



### 1) River Bank: (Beginner):

A great environment to design your Paludarium around is a river bank which gives you plenty of interesting marginal plants to include as well as attention-grabbing aquatic and terrestrial fauna. Building a tank with this theme in mind carries lots of potential for a lush planted embankment that makes a great home for amphibian species.

- **Substrate:** Zoo Med's ReptiSand®, Aquatic Turtle Pebbles™, and aquarium gravel are all good options to provide a base layer in a riverbank biotope.
- **Décor:** Stones and cork branches are low in tannins and can help recreate a clear water biotope.
- **Plants:** Creeping Jenny, Ferns, Pothos, Shingle Plant.
- Over time, marginal plants that are situated towards the edge of the land feature will eventually extend roots beyond the shelf and into the water column where they will provide a safe haven for any fish fry to hide in.



SW-20 Reptisand

Position your Zoo Med Paludarium Heater and Filter where they can be accessed for future maintenance.

d Add the appropriate substrates for the aquatic and land features. Arrange larger décor before planting.

ic Situate the aquatic and terrestrial plants where you would like them and fill up the water feature slowly.

T Add the Paludarium lighting kit or light source of your choice. Plug in the filter, heater, and lights and allow your tank to mature for 3-4 weeks, then add your pets!



New Zealand Sphagnum Moss, and Frog Moss will help to maintain a stable humidity level for your pets.

- **Animals:** Spotted Newt, Mtn. Horned Dragon, Day Gecko, Dwarf Frog, Rasbora, White Cloud Minnow, Danio, Freshwater Shrimp.



## 2) Freshwater Marsh: (Beginner):

Swamp Cypress (*Taxodium distichum*) is a semi-aquatic tree found in freshwater marsh environments that can be used in larger Paludariums; It will need to be dwarfed through careful pruning to keep it suitably sized. A number of different newt or frog species would be at home in this type of Paludarium. This biome is typically characterized by slow water movement, tall trees, plenty of floating plants, and beautiful hanging mosses such as Spanish moss.

- **Substrate:** ReptiSand or River Pebbles for the aquatic substrate, Reptisoil® and Sphagnum or Frog Moss for the land feature.
- **Décor:** Mopani Wood, Cork branches, Spiderwood.
- **Plants:** Duckweed, Frogbit, Parrots feather, Dwarf Mondo Grass.
- **Animals:** Pygmy Sunfish, Freshwater Shrimp, Crayfish\*, Freshwater Snails, Killifish, Anoles, Tree Frog.

**\*NOTE:** Crayfish may eat other aquatic pets and so are best kept without fish and shrimp.

Position your Zoo Med Paludarium Heater and Filter where they can be accessed for future maintenance.



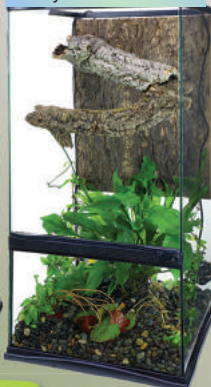
MW-M Mopani Wood

Add the appropriate substrates for the aquatic and land features. Arrange larger décor before planting.



CF3-FM Frog Moss

Situate the aquatic and terrestrial plants where you would like them and fill up the water feature slowly.



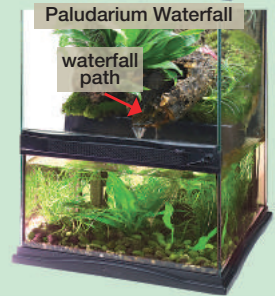
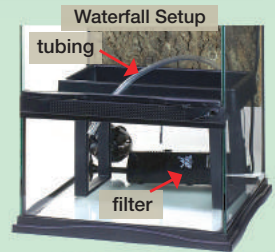
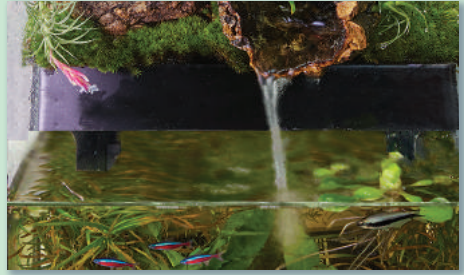
Add the Paludarium lighting kit or light source of your choice. Plug in the filter, heater, and lights and allow your tank to mature for 3-4 weeks, then add your pets!



Mondo Grass

### 3) Waterfall (Beginner):

An excellent introductory Paludarium to attempt is one with a cascading water feature and plenty of colorful, eye catching plants. Many tropical plant species will benefit from the increased humidity, and the pleasant sound from a waterfall can be a soothing centerpiece in your home or office. Building a waterfall can easily be accomplished by using either Zoo Med's Naturalistic Terrarium™ Waterfall Kit or by attaching a hose to your Paludarium Filter and carefully arranging décor for the water to flow down.



- **Substrate:** Sand or pebbles are suitable for aquatic substrate. ReptiSoil, EcoEarth® and mosses work well for the land feature, especially when including live plants.
- **Décor:** Sandblasted Grapevine, Mopani Wood, Cork branches, Spiderwood.
- **Plants:** Azolla, Ludwigia, Java Fern.
- **Animals:** Freshwater Shrimp, Crayfish\*, Freshwater Snails, Killifish, Minnows, Tree Frog.

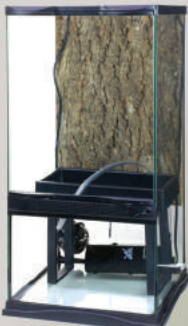
**\*NOTE:** Crayfish may eat other aquatic pets and so are best kept without fish and shrimp.

Position your Zoo Med Paludarium Heater and Filter where they can be accessed for future maintenance.

Add the appropriate substrates for the aquatic and land features. Arrange the waterfall tubing so the water flows back down your décor.

Situate the aquatic and terrestrial plants where you would like them and fill up the water feature slowly.

Add the Paludarium lighting kit or light source of your choice. Plug in the filter, heater, and lights and allow your tank to mature for 3-4 weeks, then add your pets!



# SETTING UP YOUR PALUDARIUM

## Habitat Setup:

The best way to begin setting up a Paludarium is by choosing the inhabitants and building the environment suited to their specific requirements. Always be sure to thoroughly research your pet's requirements before acquiring them. A list of recommended animals can be found at the end of this book.

## Water Feature:

Once you have decided which animals you will keep in your Paludarium, you can select a suitable substrate for the water feature. The type of environment you are striving to recreate will determine the appropriate substrate to use; for example, a river themed Paludarium would work well with a combination of Zoo Med's River Pebbles® and aquarium gravel. Before introducing substrate into the water feature, be sure to rinse it thoroughly with cool water.



TP-20 River Pebbles®

## Land Feature:

A land feature in your Paludarium can provide a number of different benefits. A land area may serve as a place for semi-aquatic species to retreat from the water, a safe area for reptiles to lay eggs, and an excellent rooting space for terrestrial plants. Creating a land feature is simple with Zoo Med's Paludarium Platform with included Substrate Tray. This item can provide a stable terrestrial level and a base for building arboreal features into the habitat. After putting together the Paludarium Platform, place it in the Paludarium making sure that it is resting directly on the Paludarium floor.



PP-L Paludarium Platform

After you have decided on the species you will be housing along with their appropriate substrate, choosing a suitable combination of plants, rocks, and wood pieces will add the finishing touch. Packing Zoo Med's Cork Rounds with Reptisoil® and arranging it on your land feature will help to give deeper rooting plants some structure and will also help form minor elevation changes on your land feature, creating more depth.



CF9-M Cork Rounds



ZM-52 Flexible Vine

When selecting suitable live plants for your Paludarium, it is best to orient them so the ones with the highest light

requirements are closest to the top. This will help provide partial shade for the marginal plants or mosses that can be placed towards the bottom of your land feature. Vines are great to help fill canopy space and do well when they are gently trained around branches or perches.

### Filtration:

Having adequate filtration is key to maintaining a healthy aquatic environment. Zoo Med's Paludarium filters do an excellent job of aiding in mechanical, biological, and chemical filtration while maintaining a low profile. It can be placed in a corner of your Paludarium to remain out of sight, and when it comes time to change the filter cartridge the Easy Access Door™ allows your filter to stay in place while you service it. For extra interest, the Paludarium filter can be used to create a waterfall feature in your Paludarium. Waterfalls can increase water movement, humidity, and provide a source of food for arboreal animals.



PF-11 Paludarium Filter 20



waterfall flowing over Mopani

### Heating:

Depending on the aquatic animals you decide to house in your Paludarium, a submersible heater may be necessary in order for your fish or aquatic invertebrates to thrive. Zoo Med's Paludarium Heater is a discreet and versatile submersible heater that comes in 25W, 50W, and 100W options for water features up to 7, 15, or 30 gallons. These heaters are programmable between 68-93°F (20-34°C) and can be used to keep your aquatic animals at their optimal temperature, or to encourage breeding behavior.



PH-100 Paludarium Heater

### Lighting:

Proper lighting is an essential component of a living habitat. In addition to making the tank look bright, different types of lights can support plant growth and animal health. If your Paludarium will be housing only live plants and/or amphibians, Zoo Med's Reptisun® LED Or Nano LED can be used. LEDs have the ability to create a very bright light that is necessary for live plant growth. Be sure to do some research on your plant choices and place "high" light plants near the top of the vivarium with "low" light plants further away.



LF-38 Paludarium Lighting Kit





ES-5N Nano LED

If you will be housing reptiles in your Paludarium, they will need a source of UVB to help keep them healthy and prevent Metabolic Bone Disease. Zoo Med's Reptisun® LED UVB fixture is an excellent choice because it combines bright LED lighting with the UVB output from a T5 lamp. Another option is Zoo Med's Paludarium lighting kit which includes a Mini Compact Fluorescent Reptisun® 5.0 UVB lamp and a Nano LED plus the fixture to house both of them!

A final consideration when choosing lighting is temperature. There are many different heat lamps available that can help support the temperature requirements of tropical species. Basking Spot Lamps® and Nocturnal Infrared Heat Lamps™ housed in a Deep Dome Lamp Fixture™ are great choices to keep tropical pets comfortable day or night. When using a heat lamp, be aware of lamp placement as placing a heat lamp very close to a live plant may cause it to overheat.



SL-50 Basking Spot Lamp

It is a good idea to build your Paludarium and let it mature for 3-4 weeks in order for the plants to grow in and to allow the water feature to establish a healthy beneficial bacteria colony before introducing your aquatic pets. Always make sure to use AquaPure™ to ensure tap water is safe for your fish or invertebrates.



RS-100 Infrared Heat Lamp

Below are a few suggestions of some species you can house in a Paludarium to get started, but there are countless other species that can be kept. Zoo Med always suggests researching compatibility when housing more than one species in an enclosure. For more ideas and videos of how to set up a Paludarium, please visit: [zoomed.com/paludarium/](http://zoomed.com/paludarium/)



African Dwarf Frog

## Paludarium Animals

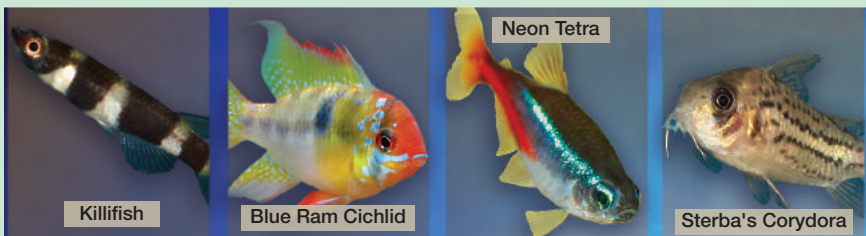
- Eastern Spotted Newt (*Notophthalmus viridescens*)
- Blue-spotted Salamander (*Ambystoma laterale*)
- White's Tree Frog (*Litoria caerulea*)
- Mossy Frog (*Theloderma corticale*)
- Red-Eyed Tree Frog (*Agalychnis callidryas*)
- African Dwarf Frog (*Hymenochirus boettgeri*)
- House Gecko (*Hemidactylus frenatus*)
- Mountain Horned Dragon (*Acanthosaura spp.*)

- Day Gecko (*Phelsuma spp.*)
- Grass Lizard (*Takydromus sexlineatus*)
- Rough Green Snake (*Opheodrys aestivus*)
- Green Anole (*Anolis carolinensis*)



## Paludarium Fish

- Endler's Livebearer (*Poecilia wingei*)
- Guppy (*Poecilia reticulata*)
- Rasbora (*Rasbora spp.*)
- Killifish (*Fundulus spp.*, *Aphyosemion spp.*, *Epiplatys spp.*, *Rivulus spp.*)
- Neon Tetra (*Paracheirodon innesi*)
- White Cloud Minnow (*Tanichthys albonubes*)
- Glowlight Tetra (*Hemigrammus erythrozonus*)
- Sterba's Corydora (*Corydoras sterbai*)
- Salt and Pepper Catfish (*Corydoras habrosus*)
- Celestial Pearl Danio (*Danio margaritatus*)
- Banded Panchax (*Epiplatys annulatus*)
- Banded Pygmy Sunfish (*Elassoma zonatum*)
- Blue Ram Cichlid (*Mikrogeophagus ramirezi*)

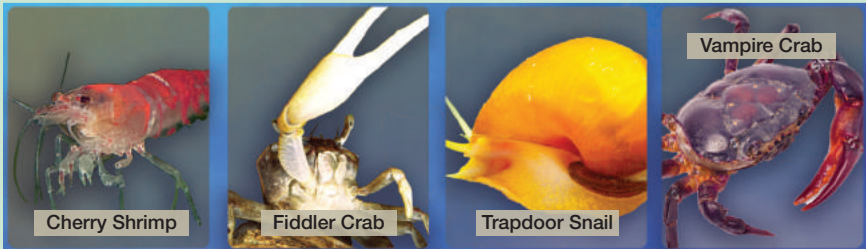




## Paludarium Invertebrates

- Vampire Crab (*Geosesarma dennerle*)
- Dwarf Crayfish\* (*Cambarellus patzcuarensis*)
- Cherry Shrimp (*Neocaridina davidi*)
- Bee Shrimp (*Caridina cantonensis*)
- Amano Shrimp (*Caridina multidentata*)
- Bumblebee Shrimp (*Caridina breviata*)
- Babaulti Shrimp (*Caridina babaulti*)
- Fiddler Crab (*Uca spp.*)
- Tiger Snail (*Neritina natalensis*)
- Fishing Spider (*Dolomedes spp.*)

**\*NOTE:** Crayfish may eat other aquatic pets and so are best kept without fish and shrimp.



## Paludarium Plants

### (Terrestrial)

- Pothos (*Epipremnum aureum*) climbing plant, medium light
- Ferns (*Pteridophytes spp.*) high humidity, medium light
- Creeping Jenny (*Lysimachia nummularia*) marginal plant, high light
- Creeping Fig (*Ficus pumila*) climbing plant, indirect light
- Shingle Plant (*Maregravia spp.*) climbing plant, indirect light
- Dwarf Mondo Grass (*Ophiopogon japonicus*) ground cover, indirect light

### (Aquatic)

- Frogbit (*Limnobium laevigatum*) floating plant, medium light, low surface movement
- Salvinia (*Salvinia molesta*) floating plant, medium light, low surface movement

- Azolla (*Azolla caroliniana*) floating plant, medium light, low surface movement
- Java Fern (*Microsorium pteropus*) medium light
- Water Trumpets (*Cryptocoryne spp.*) low light
- Anubias (*Anubias barteri*) medium light, rhizome anchored above substrate

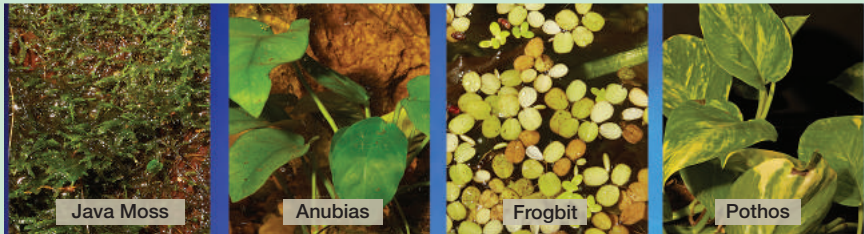


Java Moss

### (Semi-Aquatic)

- Red Mangrove\* (*Rhizophora mangle*) high light
- Swamp Cypress (*Taxodium distichum*) medium light
- Money Tree (*Pachira aquatica*) medium light

**\*NOTE:** \*Be sure to check your state agriculture laws to ensure Red Mangrove (*Rhizophora mangle*) is not considered an invasive species.



Java Moss

Anubias

Frogbit

Pothos

## **Black Water Biotope (Difficulty: Moderate):**

A South American black-water biotope will recreate portions of the Amazon River and can house a variety of animals.

- **Substrate:** Zoo Med's Reptisand® is a great substrate choice. Adding Zoo Med's River Pebbles® along with leaf litter will bring the tank together and help recreate the dark acidic water that gives the region its name.
- **Décor:** To help recreate the tea-colored water from this environment, Zoo Med's Mopani Wood is an excellent source of natural tannins that will leach out over time and contribute to lower pH.
- **Plants:** Low light plants are best; *Cryptocoryne* and *Anubias* species work particularly well and are very hardy.
- **A note on Anubias:** The rhizome should remain above



the substrate in the water feature. There are a couple of ways to accomplish this. First, you can plant the roots in the substrate, ensuring that the rhizome stays above the top of the substrate or you can use fishing line or thread to tie it to a submerged decoration like Zoo Med's Mopani Wood. Over time, its roots will grasp onto the decoration or reach down and fix itself in the substrate or wood.



Anubias

- **Animals:** Neon Tetras, Glowlight Tetra, Corydora, Dwarf Cichlid, Freshwater Shrimp, Snails, Red Eye Treefrog, Long Tail Grass Lizard.

### ***Brackish Swamp (Difficulty: Advanced):***

Building a Paludarium with a swamp theme can be challenging and take some time for the appropriate plants to take hold, however they make for a very unique display piece. In a brackish themed swamp environment, Red Mangroves (*Rhizophora mangle*)\* can be utilized to create a natural root maze for smaller fish to take shelter in. This species of mangrove grows well in brackish and freshwater environments and does a great job of performing natural filtration through nutrient uptake directly from the water column. As it matures, this plant will need to be pruned similar to a bonsai tree to keep it dwarfed so it does not outgrow the tank. Be sure to provide it with a strong light source such as Zoo Med's Reptisun® LED Terrarium Hood.



Red Mangrove

- **Substrate:** ReptiSand®.
- **Plants:** Red Mangrove (check state laws).
- **Animals:** Crabs, Shrimp, Snails, Rough Green Snake.



Mondo Grass



Red-Eyed Tree Frog



Gold Dust Day Gecko

# Zoo Med Paludarium Products



RSS-10 Reptisoil



TP-20 River Pebbles®



SR-20 Reptisand



CF3-FM Frog Moss



TH-31 Digital Combo  
Thermometer/Humidity  
gauge



LT-12 Repticare®  
Terrarium Controller



EE-10 Eco Earth



CF3-NZ Sphagnum Moss



LF-25 Combo Deep Dome  
Dual Lamp Fixture



ES-5N Nano LED



SL-50 Basking  
Spot Lamp



RS-100 Infrared  
Heat Lamp



NCB-2 Cork Tile



NWB-2 Forest Tile



PSG-L Grapevine

# Zoo Med Paludarium Products



- NT-2PK Paludarium Kit**
- Paludarium 12 x 12 x 24".
  - Paludarium Filter.
  - Dual Deep Dome Light Fixture.
  - 5.0 Compact Mini Fluorescent.
  - Nano LED 5W.
  - Sphagnum Moss.
  - Natural Wood Decor.
  - Paludarium Platform.
  - Eco Earth Substrate.



**NT-2P Paludarium small (12x12x24")**



**NT-5P Paludarium large (18x18x36")**



- LF-38 Paludarium Lighting Kit**
- Mini Combo Deep Dome Dual Lamp Fixture.
  - Reptisun 5.0 UVB CFB.
  - Nano LED.



**PP-L Paludarium Platform**



**PH-100 Programmable Paludarium Heater**



**PF-11 Paludarium Filter 20 with extra long cord**



**CF9-M Cork Rounds**



**MW-M Mopani Wood**



**Spiderwood**

ISBN-13: 978-0-692-13462-7



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**PFC-11 Replacement Filter Cartridge**

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