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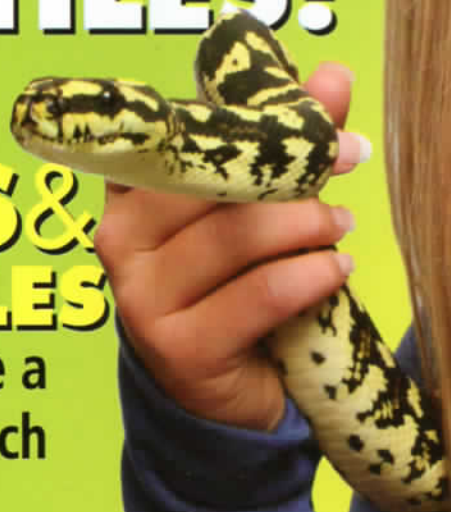
Reptiles

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The Madagascar blue reed frog (*Heterixalus madagascariensis*) can be found along the edges and inside rain forests, in croplands, and in urban areas.

AMAZING ACROBATS

Ideal captives, colorful reed frogs entertain nightly.

by Devin Edmonds

I opened the lid on a container marked in black ink with the words “banana reed frog.” Out of the cup flew a blur of color. I paused, looked around and saw on a nearby table leg a 1-inch-long, golden-tan striped frog prepared to take a second leap. I bolted forward and cupped it.

This scene is familiar to those who keep reed frogs. The sporadic and seemingly unpredictable movements of these tiny, semiarboreal frogs can lead to a risky game of cat and mouse in the herp room. Although their acrobatic behavior can easily lead to escapes, it also makes for a fascinating show at night in the terrarium. Frogs launch off plant leaves to catch unsuspecting houseflies resting on the sides of their enclosure. These agile frogs are then capable of climbing upside down on the ceiling of their home to continue the hunt. Skilled at maneuvering in all directions and erratically flying into the air at any time, reed frogs are talented acrobats of the frog world.

Hyperolius punctatus lives in dry and moist forests, savanna woodlands and bush.



Hyperolius puncticulatus
lives in dry and moist
forests, savanna
woodlands and bush lands.

PH. LAURENTINI

Hyperolius puncticulatus (shown here) was once thought the same species as *Hyperolius mitchelli* because the two species look similar.



DISTINGUISHING THE REEDS

The common name "reed frog" is usually used to describe members of three African genera: *Afixalus*, *Heterixalus* and *Hyperolius*. All are small, nocturnal frogs. Some mature adults are only slightly more than one-half-inch long, but others reach 1½ inches in total length. Although small, these frogs are capable of making impressively loud noises at night. Males call in excitement to defend territories and attract mates. They sometimes do so perched on tall grasses or emergent vegetation in the wild, and they use their sticky toe pads to climb to these elevated positions. When frightened, they may jump down to the water below and use the webbing between their toes to swim.

Reed frogs display an incredible array of colors and patterns. Stripes, spots and blotches form beautiful markings on many species. A single frog can transform its appearance depending on its environmental conditions. In hot conditions, colors fade and give reed frogs a ghostly look. At night, detailed patterns may blend together into a brown blur. Under bright light, reed frogs often display their most attractive

Quarantine First

At first, reed frogs should be housed in simple, hygienic housing that allows you to monitor them carefully. Once you are assured they are healthy, they can be moved to a more natural setting if desired.

A standard 10-gallon aquarium lined with moist paper towels and furnished with artificial plants and a small water bowl is suitable. I've never provided any special lighting while reed frogs have been in quarantine. They just receive ambient light from the room.

Watch frogs at night when they are active and hunting to become familiar with their behavior. Slowly fatten thin frogs during this initial period by feeding small crickets and houseflies. Any individuals appearing unhealthy during acclimation should be separately quarantined. Consult a veterinarian for advice about having fecal samples examined for internal parasites.

PHOTO: DEVIN LINDNER

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Heterixalus madagascariensis has a darkened stripe through its eyes.



The colors of *Heterixalus madagascariensis* fade at night to blend with leaf litter.

coloration. This variability can make identifying species difficult. To add further to the confusion, certain *Hyperolius* species are sexually dimorphic to the extent that males and females look completely opposite one another.

Sometimes considered true reed frogs, *Hyperolius* species are distinguished from *Afrixalus* and *Heterixalus* species by their horizontally oriented pupil. The genus contains more than 120 species. Ranging throughout sub-Saharan Africa, they occupy a variety of habitats. Some species spend their days asleep on vegetation at the marsh's edge, and others live in humid savanna woodlands. Many *Hyperolius* frogs are adaptable and survive in habitats altered by humans, such as agricultural land or urban areas. Other species have restricted distributions and have limitations on where they can live.

The genus *Afrixalus* is also endemic to sub-Saharan Africa. It contains slightly more than 30 species. All deposit eggs on leaves overhanging water, even those inhabiting savannas and bush lands. Most then fold the leaf over the egg mass, creating something like an egg sandwich.

In the pet trade, *Afrixalus* frogs are sometimes called "banana frog" or "spiny reed frog." *Afrixalus* species may not display the flashy coloration of many *Hyperolius* and *Heterixalus* species, but their subdued patterns of silver, tan and gold are still attractive.

The 11 species of *Heterixalus* are endemic to Madagascar, an island off the coast of Mozambique. They spend their days exposed to the sun alongside pools of water and rice paddies. Although not as common in the pet trade as *Afrixalus* and *Hyperolius* species, *Heterixalus* frogs make elegant captive amphibians at home in a well-designed, living vivarium. The species regularly available can display eye-catching blues, oranges and yellows. Their vertical pupils distinguish them from *Hyperolius* species, and their coloration and pattern set them apart from *Afrixalus*. However, it's risky to identify reed frog species based solely on coloration. In the pet trade only two species are available with any frequency: the starry-night reed frog (*Heterixalus alboguttatus*) and the Madagascar blue reed frog (*Heterixalus madagascariensis*).

COMING TO TERRARIA NEAR YOU

Among the three genera there are more than 150 species of reed frogs, but only a fraction of that number appear in the pet trade. Sporadically offered for sale, the argus reed frog (*Hyperolius argus*) is a dazzling species. This frog is found in low-elevation savanna and grassland. Brown females are patterned with cream spots, and males are solid green and occasionally have black flecks. They look nothing like their female counterparts.

These males look like a larger version of the tiny green *H. pusillus*, which lives among lowland swamp vegetation in southeast Africa. The pet trade sometimes calls it the "glass reed frog" because of its translucent skin.

Hyperolius pusillus is only sporadically imported. Males are a little more than a half-inch to nearly 1 inch in size.

Also green is the tinker reed frog (*H. tuberilinguis*). They are found in savanna woodlands, bush lands and grasslands along Africa's eastern coast. *Hyperolius tuberilinguis* can easily be differentiated from *H. pusillus* and male *H. argus* by its large size, often yellow-toned coloration



Tadpoles, such as this *Heterixalus madagascariensis*, are hardy as long as water quality is maintained.

REXUS EMMERTS

and more pointed snout. *Hyperolius tuberilinguis* males usually measure between 1 inch and 1½ inches, and females are between 1¼ and almost 1½ inches long.

Multiple color morphs of the common reed frog (*H. viridiflavus*) regularly appear for sale. With differing colors throughout their range, they likely comprise multiple species. Taxonomists continue to disagree about what species and subspecies make up the *H. viridiflavus* complex, but future molecular work may help sort out the mess. Some forms are striking with contrasting lemon and black pinstripes extending down their back. Uniformly off-white to tan dorsally but with a red belly, others are more subdued in color. Members of the *H. viridiflavus* complex inhabit savannas often at the edge of lakes, ponds and marshes.

Potentially confusing in appearance are the Mitchell's reed frog (*H. mitchelli*) and the spotted reed frog (*H. punctulatus*). Both are available from time to time and appear similar: russet with a white to golden stripe wrapping around their heads. Much of their ranges overlap, and they were once thought to be the same species. Their habitats contain dry forests,

moist forests, savanna woodlands and bush lands. The best way to differentiate the two is to examine their hind limbs. Mitchell's reed frogs have a pair of white dots at the joint. These are absent in the spotted reed frog.

A couple *Afraxalus* species are available periodically. Clown reed frogs (*A. paradorsalis*) from Cameroon and Nigeria have a distinct tan stripe, bordered by two

light-white stripes, running down their backs. They prefer marshy areas and degraded former forest.

Larger than the clown reed frog is the banana reed frog (*A. fornasinii*). In strong lighting it displays an attractive silver dorsum and tan body, and it turns a darkened brown in dim conditions. Most have a pinstripe running down their backs through the silver, but banana reed frogs

Finding These Frogs

Reed frogs are frequently imported from Africa for the pet trade. These wild-caught amphibians are inexpensive. Because of their low cost, wild-caught reed frogs are sometimes sold in poor condition. Carefully inspect each frog. Avoid those looking thin, lethargic or otherwise unhealthy. A reed frog in good condition is responsive when awake, and its body has a rotund appearance when asleep on the terrarium glass.

To avoid problems often associated with wild-caught reed frogs, you may be able to locate a breeder on the Internet, or through a local store or herpetological society. This can be difficult because reed frogs are not frequently bred in captivity, but persistence makes it possible to locate captive-bred *Hyperolius* and *Heterixalus*. Less attention has been paid to *Afraxalus* by frog breeders.

Although reed frogs do not need company, it may be advantageous to purchase more than just a pair if breeding is your goal. Do not house different species of reed frogs together.



In the daytime the starry-night reed frog (*Heterixalus alboguttatus*) displays banana-yellow spots over a translucent, bluish background.

with solid silvery-white backs also exist. The only terrestrial frog known to feed on frog eggs in the wild, they live in moist savannas, bush lands, dry forests and grasslands.

Two members of the Madagascar-endemic genus *Heterixalus* also appear in the pet trade. The most common is the starry-night reed frog (*H. alboguttatus*). Like most reed frogs, this species is quite variable. During the day, many display detailed banana-yellow polka dots over a translucent blue background. At night the dots fade, transforming starry-night reed frogs into a uniformly brown frog. They live in savannas, grasslands and rice fields.

The other *Heterixalus* species occasionally available is the Madagascar blue reed frog (*H. madagascariensis*). In their prime coloration, they are sky-blue with orange feet and a darkened stripe running through the eye. They can be found along the edges and within rain forests, in croplands, and in urban areas.

SETTING UP THE BIG TOP

After purchasing reed frogs, you should quarantine them for a month or two. Once sure your new frogs are in prime condition, you can move them to more elaborate housing that better displays their attractive colors. Alternatively, the simple setup you used to initially house frogs can be used long term, but it must be cleaned often. A 20-gallon aquarium is large enough for a group of six to 10 frogs. Use a tight-fitting screen cover to prevent escapes. Reed frogs love to wedge in between the plastic rim of an aquarium and its cover, so take care not to spook any frogs sleeping there when accessing the tank.

Substrate should retain moisture and be safe for amphibians. It must also be able to support live plants if you wish to create a living vivarium. Coconut husk fiber is a good option. It can be purchased in a dry, compressed brick at pet stores. Mix in tree fern fiber or fir bark if you are growing species of plants that require well-drained soil. Long-fiber sphagnum moss available from garden centers also forms a good substrate. First soak the moss in water and then wring it out to create a moist, spongelike bedding.

Beneath the coconut husk fiber or sphagnum moss, place a section of fiberglass window screen. Below this

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screen add a 1- to 2-inch layer of gravel, lightweight expanded clay aggregate (LECA) or some other drainage substrate. This bottom layer ensures the coconut husk fiber or sphagnum moss does not become waterlogged.

To complete the setup, form a pond in the front of the terrarium. Slope the soil and drainage substrate, or simply provide a large water bowl. Use tap water treated with an aquarium water conditioner that removes chlorine and chloramines. Many pet stores selling fish stock this conditioner.

Live plants add aesthetics to reed frog housing, and they serve as resting spots for frogs while they sleep during the day. Although they aren't required, it seems like a waste to have a brightly lit enclosure designed for small, colorful frogs without also a carefully planned landscape full of live plants. Common houseplants such as philodendron, *Scindapsus* and *Sansevieria* plants, bromeliads, and small *Calathea* plants are all good options. You might like to seek out dwarf or miniature plant varieties from specialty terrarium supply companies. Thoroughly wash plants before use and grow them outside the terrarium for several weeks to allow fertilizers, leaf



When filling a frog's water bowl, remember to use tap water treated with a water conditioner that removes chlorine and chloramines. You can find conditioners at most aquarium stores.

shiners or other potentially harmful chemicals to dissipate.

Use branching pieces of driftwood, cork-bark tubes or sections of bamboo for perches. For the best appearance, use only one type of wood in small enclosures. Although I usually observe my reed frogs resting on plant leaves or the terrarium's

glass sides during the day, perches are used at night for calling spots and footing.

RECREATING CONDITIONS

Unlike many nocturnal amphibians, which are secretive during the day, reed frogs are quite bold. Wild *Hyperolius* and *Heterixalus* species typically spend their

Breed the Reed

It seems strange that reed frogs are only occasionally bred in captivity considering their striking colors and ease with which some spawn under captive conditions. Sometimes breeding occurs without any added stimuli; other times it helps to emphasize seasonal changes. Increasing humidity levels by misting the cage several times daily (depending upon the terrarium's current humidity level) and feeding nightly may encourage breeding. Some frogkeepers also report water features, such as waterfalls and drip walls, help stimulate breeding in certain species.

Heterixalus frogs are not seasonal breeders like many *Hyperolius* and *Afraxalus* frogs, and they may not require seasonal changes in temperature or water availability to breed, but it depends on which species you are dealing with.

To distinguish between sexes, listen to your frogs at night. Males are noisy, calling with startlingly loud intensity. If you cannot identify which frog is calling, examine their vocal sacs the next morning. Males' vocal sacs will be swollen. Many species can also be sexed by size. Females are typically larger, but in some species, such as the Parker's reed frog (*Hyperolius parkeri*), the males are larger. In some, such as the argus reed frog (*Hyperolius argus*),

there may not always be a size difference between sexes.

Reed frogs deposit eggs in many locations. Provide *Afraxalus* species with leaves overhanging water in their enclosure. *Hyperolius* frogs use a diverse array of egg deposition sites depending on the species. Many readily lay eggs on the glass of a terrarium above water, or on emergent vegetation or debris. Some, such as glass reed frogs (*H. pusillus*), lay their eggs between the leaves of floating vegetation in the wild. In captivity, you could attempt to recreate these spots by moving your frogs to a semiaquatic setup with water lettuce (*Pistia stratiotes*) or water hyacinth (*Eichhornia crassipes*). *Heterixalus* frogs typically lay eggs on submerged vegetation in captivity, but infertile eggs are sometimes found above water on plants. A group of Malagasy blue reed frogs (*H. madagascariensis*) I maintain have repeatedly deposited eggs on submerged parrot feather (*Myriophyllum aquaticum*) and among Amazon frogbit roots (*Limnobium laevigatum*).

Anywhere from 50 to 600 eggs are deposited depending on the species, and a group of captive reed frogs can produce a large number of offspring annually. If eggs are laid in a suitable location, they can hatch within the terrarium.

Provide reed frogs with plenty of plant life to hide in and perch upon. This is *Hyperollus rubrovermiculatus*.



days exposed. They sleep on emergent vegetation and take in the sun's rays. In this bright light they lighten in color, and stunning canary-yellow spots, scarlet bands or other attractive colors appear. *Arixalus* frogs are not always as outgoing during daylight hours.

Provide strong lighting for captive reed frogs. Two or three standard fluorescent bulbs that span the length of the tank are usually adequate. On particularly tall terrariums or large enclosures, opt for compact fluorescents or high-output T5s.

Lighting should run for 12 to 14 hours each day. An electrical timer can be used to regulate this photoperiod. Pay attention to the color temperature of the bulbs you choose. Those in the range of 5,000 to 6,500 Kelvin produce bright-white light, which most people consider looks best. Although ultraviolet lighting is not required to keep reed frogs, it's worth experimenting with it because it's possible the benefits of UV lighting for reed frogs may not be fully understood yet.

Incandescent lighting can be used to warm areas of the cage if necessary. Position the bulb above a corner or one end of the terrarium. Take care not to use overly powerful bulbs, and always use an accurate thermometer to check the temperature beneath. Bulbs should be far enough away from the cage to create a warm area approaching about 90 degrees Fahrenheit. The best bet is to use a good thermometer to determine how far away the bulb should be depending upon how strong it is.

Reed frogs live in a variety of habitats and experience a range of temperatures in the wild. When in full sunlight during the afternoon, temperatures peak and then slowly cool as night arrives. Try to duplicate this fluctuation in captivity. Provide a thermogradient within the enclosure during the day, the warmest part of which cools at night. Under a low-wattage incandescent light bulb, the temperature can approach 90 degrees. Farther from this warm spot, the enclosure should remain between 70 and 80 degrees during the day. At night, turning off lighting cools the enclosure. Drops into the low 60s are not typically a problem. You can use a digital thermometer with an external probe to accurately measure the temperature in different parts of the cage.

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LEFT: Dots on the starry-night reed frog (*Heterixalus alboguttatus*) often appear during the day. **RIGHT:** At night, these daytime dots fade and transform the frog's color into a subdued brown. The species can often be found clinging to the sides of its enclosure.

Complement these moderately warm temperatures with varying levels of humidity. The terrarium should be misted every other day. Following a misting, the ambient humidity level can reach 100 percent, decreasing as the enclosure dries. Most reed frogs do not need high-humidity levels. These temporary increases should be enough to keep your frogs in good condition. Avoid stagnant or wet conditions.

SUPERB PREDATORS

Reed frogs are superb predators, launching at lightning speed toward any consumable invertebrate. Feed them a varied diet to ensure nutritional requirements are met. Crickets measuring between one-fourth and one-half inch can form the staple of their diet. Flightless fruit flies are also accepted.

Houseflies are relished. Purchased in their larval form from bait and tackle shops, flies can be allowed to pupate. Then place them in the refrigerator for storage. Feed flies at night, and watch with a flashlight as your frogs put on a show. They'll chase the flying insects around the terrarium.

Some herpkeepers report that their reed frogs accept small waxworms and other insect larvae from feeding bowls, but the species I have maintained seem to prefer crickets and flies.

Offer food three times a week or in smaller quantities every night. If uneaten feeder insects are in the enclosure the following morning, reduce the quantity you are feeding.

An important aspect of your frog's diet is vitamin and mineral supplementation. Even with a varied captive diet, feeder insects' nutritional content does not come close to the variety consumed by wild reed frogs. To prevent nutritional deficiencies and imbalances, use a high-quality multivitamin and a calcium supplement. I'm always hesitant to give an exact schedule for dusting feeders because it depends on so many factors, but using supplements for adult reed frogs at least once a week usually works

well. Juveniles can have their food lightly coated in calcium and multivitamin supplements every feeding.

ENJOY THE SHOW

With their exquisite appearance, small size and active behavior, reed frogs make ideal captive amphibians. Start with healthy, preferably captive-bred frogs. Offer them a varied diet, provide a suitable environment, and you, too, can enjoy viewing these amphibian acrobats' lively nocturnal behavior. □

Tadpole Care

Once hatched, tadpoles can be moved to aquariums. They can be stocked heavily if partial water changes are performed daily, but it's best to use as large a volume of water as possible, so conditions remain stable. I've raised as many as 50 or 60 tadpoles in slightly more than 1 gallon of water, but I replaced up to half of the water daily.

Tadpoles are hardy, and they grow well as long as water quality is kept in check. They can be kept in groups, but take care not to stock them too densely. If using an established aquarium with a healthy bacteria load, partial water changes may only be needed weekly. Growing aquatic plants helps maintain water quality. You can also keep tadpoles in simple aquariums with a bare bottom allowing detritus to easily be siphoned out daily.

Although the ideal diet may differ among species, most herpkeepers report reed frog tadpoles grow well when fed an assortment of fish foods. Tropical fish flake, algae wafers, bloodworms, daphnia and sinking shrimp pellets can all be used.

At anywhere between 6 to 12 weeks of age, front arms develop, and tiny reed frogs begin leaving the water. They are capable of climbing well, and frogs with tails can be plucked from the top of an aquarium as they are noticed. Once the tail is absorbed, flightless fruit flies and similarly sized crickets should be offered nightly.

Keep juveniles in small enclosures, so food can be located easily. I have maintained more than a dozen young reed frogs in cages the size of standard 2½-gallon aquariums, and I move them to larger enclosures as they mature.