Xenopus laevis African Clawed Frog

Live Material Care Guide

Introduction

Xenopus laevis, the African clawed frog is originally from southern Africa. It inhabits shallow ponds or lakes with warm, stagnant water. This amphibian is entirely aquatic with olive-brown to grayish-black dorsal coloration. The ventral side is typically a pale beige. They have strong hind limbs and forelimbs that end with claws. Their sensitive fingertips are used to locate prey, which they shove into their mouths with their front feet since they lack a tongue and teeth. African clawed frogs are used regularly in research laboratories. They were once used to detect pregnancy in women. When injected with female urine, they would produce eggs within 48 hours due to their ability to detect hCG, human chorionic gonadotropin. This frog was the first vertebrate successfully cloned and some were even taken into space to study the effect of zero-gravity on breeding cycles and development. Although extremely useful in laboratory studies, African clawed frogs pose a serious threat to native populations when released into the wild. Their voracious, predatory appetite wreaks havoc on native wildlife such as fish, other frogs and tadpoles.

Safety Precautions

Always treat live organisms with respect and proper care. For student and frog safety, minimal handling is recommended. Wash hands thoroughly before and after handling. Do not house African clawed frogs with other frogs, amphibians or animals. Follow all laboratory safety guidelines. Do not release any animals into the wild.

Habitat

Enclosure

1. Use a 10-gallon glass aquarium for one frog. Multiple frogs require a larger aquarium. A general rule of thumb is a minimum of 5 gallons of water per adult frog. When choosing an aquarium, opt for longer rather than taller.
2. A tight-fitting screen lid is necessary as African clawed frogs are excellent at escaping. As a fully aquatic species, an escape will quickly lead to dehydration and death. Metal is toxic and lowers resistance to infection, and must be avoided. Choose a screen lid without metal.
3. The bottom of the cage can be left bare or covered with large rocks. Avoid small gravel as it is often confused for food and ingested, which can cause impaction and lead to death.
4. Diminish stress by including hiding places such as an empty plant pot on its side, pieces of driftwood or rocks. Live plants are often uprooted and aquarium décor is often moved or damaged due to the frog's strong hind limbs.

Water

1. Fill the aquarium to a depth of 18–30 cm (7–12 in) with chlorine- and chloramine-free water. Dechlorinated tap water or bottled spring water can be used.
2. Water needs to be changed daily to reduce and remove the buildup of bacteria.
3. The use of a filter is optional; however, the constant vibrations and movement of water will induce stress with negative long-term effects. African clawed frogs have a sensitive lateral line (water movement sensors)—even an extremely gentle filter is likely to cause stress.

Temperature

1. Keep the enclosure and water temperature near room temperature, 20–25 °C (68–75 °F).
2. To ensure the proper temperature is maintained, an aquarium heater can be used with a thermometer on either side of the aquarium for monitoring.

Lighting

1. Keep the enclosure out of direct sunlight.
2. Natural light is sufficient with a 12/12 hour light cycle.
3. No additional ultraviolet light is needed; however, if it is desired, use a fluorescent light bulb to minimize excess heat.

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Cleaning

1. Inspect the enclosure daily and remove any uneaten food or debris.
2. Clean the entire enclosure every 1–2 weeks, unless a filter is used. Move the frog(s) into a temporary tank with chlorine- and chloramine-free water. Drain all water from enclosure. Remove all décor and rinse with hot water. Wipe any algae buildup with a clean towel. Avoid the use of any and all chemicals.
3. Refill the enclosure with dechlorinated or bottled spring water.
4. When returning the décor of the enclosure, rearrange in a different pattern. African clawed frogs are inquisitive and a change of scenery will help prevent boredom.

Nutrition/Feeding

1. African clawed frogs have no teeth and no tongue. However, they are carnivorous frogs with a healthy appetite. Feed appropriately sized food such as earthworms, wax worms, small guppies, bloodworms and small crickets 3–4 times per week. Frog brittle is an alternative to live prey.
2. Avoid foods such as sinking pellets, which are confused with gravel, and rosy red minnow or feeder goldfish.
3. Beef heart can be offered sparingly as a treat.
4. Feed 3–4 items, per frog, or as much as it can consume within 10 minutes. Remove any uneaten food.

Handling

1. Minimize handling of African clawed frogs. They have slimy, slippery skin and are easily dropped.
2. Do not use a net to handle the frogs. Their delicate and sensitive feet can be severely damaged if entangled in a net.
3. When transporting frogs to a temporary tank for cleaning, use clean, wet hands and a safe grip. Alternately, secure the frog in a small container, e.g., a cup, and transport to the temporary tank.

Tadpoles

Adult African clawed frogs require some different care than tadpoles. Here are some important differences to consider if raising from a tadpole into adulthood.

1. Keep tadpoles separate from adults. African clawed frogs are carnivorous and will consume tadpoles of their own species.
2. Tadpoles are also cannibalistic and need to be kept in small numbers. Thin out the number of tadpoles by placing them in multiple containers.
3. Tadpoles develop at different rates. Separate tadpoles based on metamorphosis stage. Tadpoles may eat others of varying size.
4. Feed tadpoles fish fry food (powdered form or ground up), frog brittle, powdered egg, or ground-up goldfish flakes. Tadpoles are filter feeders and do not have fully developed mouthparts. Do not over feed; the excess food can cause respiration issues and cloud up the water.
5. Clean water is vital for tadpole survival. Change water daily by removing 50–75% of the water and replacing with chlorine- and chloramine-free water.
6. During metamorphosis, the tadpole tail will degenerate. Stop feeding all food at this time. Nutrition is derived from the tail, so other food is not needed. When the tail is a stump, begin feeding adult food.
8. Metamorphosis typically occurs in 6 weeks and sexual maturity is reached between 10–12 months.

Disposal

Please consult your current *Flinn Scientific Catalog/Reference Manual* for general guidelines and specific procedures, and review all federal, state and local regulations that may apply, before proceeding. Never release live organisms raised in the classroom into the local environment. They may harbor pathogens that could decimate the local population or become invasive. Deceased African clawed frogs may be disposed of according to Flinn Suggested Biological Waste Disposal Method Type IV.

Tips

- Have a damp towel available when handling. If the African clawed frog gets free, drop the towel over it, making recapturing safe and easy.
- **African clawed frogs should never be released into the wild.** They are considered an invasive species and wreak havoc on local, native populations of invertebrates, amphibians and fish; such is the case in Riverside and San Diego counties, California.
- Average size is 10–15 cm (4–5 in).
- Average life span is 10–15 years, although 20 is not uncommon with appropriate care.
- Females are larger with a rounder body shape than males. Males will vocalize during breeding season. They make a clicking sound due to a lack of vocal cords.
- African clawed frogs are not toxic to other animals; however, they do possess chemical defenses to protect themselves from predators and disease. For example, predatory vertebrates are thwarted by a mildly fishy odor released by the frogs. Infection is prevented by *magainins*, organic compounds that possess powerful antibiotic, antifungal, antiparasitic and antiviral actions.
- African clawed frogs are extremely sensitive to chemicals. Do not use chemicals when cleaning the enclosure. Use a towel to wipe away any waste or algae. Never use any algae-inhibiting or water-purifying substances.

References

USGS. Nonindigenous Aquatic Species. http://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=67 (accessed March 2016).

Reptiles. www.reptilemagazine.com/frog-Amphibian-Species/African-Clawed-frog/ (accessed March 2016).

The Amphibian. http://www.theamphibian.co.uk/african_clawed_frog_care_sheet.htm (accessed March 2016).

Materials for Xenopus laevis Care Guide are available from Flinn Scientific, Inc.

Catalog No.	Description
LM1271	African Clawed Frog (Xenopus), Tadpoles
LM1272	African Clawed Frog (Xenopus), Female Juveniles
LM1273	African Clawed Frog (Xenopus), Male Juveniles
LM1274	African Clawed Frog (Xenopus), Female Adults
LM1275	African Clawed Frog (Xenopus), Male Adults
FB0211	Aquarium, All-Glass, 10 gal
FB0213	Aquarium, All-Glass, 29 gal
FB0283	Aquarium Screen Cover, 20″ × 10″
FB0226	Aquarium Heater, Submersible Type, 50W
FB0227	Aquarium Heater, Submersible Type, 100W
W0015	Water, Spring, 3.78 liters
FB2190	Frog Brittle, 1 lb, Tadpole Powder
FB2191	Frog Brittle, 1 lb, for Juvenile Xenopus
FB2192	Frog Brittle, 5 lb, for Adult Xenopus
LM1164	Crickets, Live, Pkg. of 50
LM1165	Crickets, Live, Pkg. of 100

Consult your *Flinn Scientific Catalog/Reference Manual* for current prices.