

Caring for African Clawed Frogs (*Xenopus laevis*)

A wide variety of frog species are suitable for classroom use. These range from the arboreal and terrestrial American green tree frog, to the terrestrial Pacman (ornate horned) frog, to the semi-aquatic Northern leopard frog, to the fully aquatic dwarf frog and African clawed frog (*Xenopus laevis*). These frogs are long lived, with an average life span of 15 years; range in size from 1 to 6 inches; are carnivorous; and require different tank set-ups to reflect their natural habitats. These frogs generally have simple needs and *Xenopus laevis* is one of the easiest to care for.

Xenopus laevis is commonly known as the African clawed frog due to the presence of small black curved claws on the inner three toes of their hind feet. *Xenopus* is a hardy, tongueless, tailless, fully aquatic frog. It is especially suitable for the classroom due to its adaptability.

Xenopus is not a native species in North America. Some states (such as California) require a permit from the state's fish and game regulatory office for purchase of this animal. This frog should never be released into local ponds or rivers because it is extremely hardy and will compete with the native aquatic wildlife.

Housing Requirements

Xenopus is ectothermic—its body temperature is dependent on ambient temperature. As such, it requires warm, still water (66–77°F). *Xenopus*' normal behavior is to spend most of its time lying motionless below the surface of the water. However, it is important to be aware that the adults are lung breathers; some gas (particularly CO₂) is exchanged through the skin, but *Xenopus* must come up to the surface to breathe. These frogs can drown if they cannot get to the water's surface.

BIOLOGICAL INFORMATION

- Life span: 3-20 years in captivity
- Adult (2-3 years) snout to ventral length: female, 9-14 cm (3.5-5.5 in.); males, 7-9 cm (2.8-3.5 in.); males are much smaller than females).
- Sexual maturity: ~9 months; peaks at 2-3 years
- Young: Eggs are spawned and fertilized externally in the spring. Gilled tadpoles develop into lung-breathing, tailless, four-legged juveniles by ~10-12 weeks of age.
- Diet: Carnivorous. In its natural environment, it is a carrion eater, cannibal, and also eats small worms and insects.



Frogs are very sensitive to changes in water temperature. Sudden decreases or increases in water temperature by as little as five degrees could kill them. Be sure to provide adequate water; 1–2 liters (1–2 quarts) of water is needed per frog, and the water should be at least 12 inches deep (enough to completely cover the frog).

Xenopus prefers to be housed in small groups (2–3 frogs); keeping the frog numbers down will cut down on how often the tank needs to be cleaned. Water should be clean, potable, and treated to remove chlorine or chloramines; chemicals to remove chlorine or chloramines from tap water can be purchased from pet stores where fish are sold. Do not use distilled water. The water needs to be changed daily or at least every other day, about 2 hours after feeding.

A 12-hour light/dark cycle is recommended. Provide a hiding place for *Xenopus*, such as white PVC-like pipes or aquaria rocks that they can get under. Frogs will eat marbles and other small objects; do not put them in their aquaria. Opaque aquaria are optimal, but glass aquaria are acceptable if the frogs are provided with a place to hide. Tupperware or other large tubs designed to hold food intended for human consumption are also suitable.

Frogs can jump out of containers. Lids should have holes for air, but if frogs jump out of the water, they will dehydrate and die; make sure they cannot escape.



Feeding

Xenopus should be fed two to three times per week. Ideally, it is best to feed a complete and balanced diet in the form of a commercially prepared pellet designed for carnivorous fish or specifically for *Xenopus*. *Xenopus* will also eat small worms, crickets, grubs, small pieces of raw beef liver, or other organ meat.

Frogs feed in a frenzy. They swarm the food and devour it within minutes. Usually, two hours after feeding there is no food left in the tank; if there is, you are feeding them too much. If they are swallowing each others' arms and legs, they are too crowded and are hungry!

Xenopus can be seen eating their shedding skin. This is normal.

Handling

Xenopus has a slimy protective skin coating that keeps it healthy. Wear wet, waterproof gloves when handling the frogs so as not

to disturb this coating. Do not use powdered gloves. Handle frogs gently; *Xenopus* has very sensitive nerve endings along its body. Called the lateral line system, the nerve endings look like stitches along the side of the frog's body. Do not pour water directly on these frogs when filling tanks. It hurts!

Xenopus jumps forward and darts backward, requiring two hands to hold it in place. Unlike large toads and other frogs, they will not go limp and allow you to hold them with one hand around their middle.

Diseases

Xenopus is a generally hardy animal and does not often get sick. However, environmental disturbances, such as poor water quality, can lead to health problems. Signs of sickness include moving slowly, hanging out on the surface of the water, inability to dive, or staying at the bottom of the tank.

If you notice bloating, shedding of large amounts of skin, tufts of cottony or fuzzy white stuff growing on the skin, red spots, red streaks, or a swollen, reddened body appendage on one of your frogs, isolate the sick frog from the others and take it to the veterinarian immediately.

Human Health Concerns

Potentially harmful infectious agents may occur in the frogs' water, so wearing gloves protects people from contamination.

Some individuals are allergic to latex; parents should be alerted if latex gloves will be present in the classroom. You can also use non-latex gloves.

Seek the advice of a physician if a human disease is suspected due to contact with any species of frog.

Resources

1. Amphibians, chapter in *Assistant Laboratory Animal Technician Training Manual*, 2008, American Association for Laboratory Animal Science, Memphis, TN.
2. Contact your veterinarian or a local veterinary school or veterinary technology program to get more information about this animal species.