herpy

FROGS

African Bullfrog

Pyxicephalus adspersus

Pyxicephalus adspersus is one of the largest frogs in the world: a heavy, olive-green burrowing frog from southern and eastern Africa, where the males can reach 25 cm and guard their tadpoles. It eats almost anything it can overpower, bites hard and can live 20-30 years in captivity. It suits the keeper who wants a large, striking animal and has respect for the mouth.

Family: Pyxicephalidae

KEY FACTS

THE ANIMAL

Adult size	**9-25 cm** snout-vent length
Lifespan	**15-30 years**
Active	**At dusk and at night**
Lifestyle	**Terrestrial and burrowing**
Habitat	**Semi-desert, savanna and wetland**
Skin toxins	**None known**
Difficulty	**Intermediate**

CARE

Min. enclosure	**90 × 45 × 45 cm** L × W × H for 1 adult
Temperature, day	**24-28 °C**
Basking spot	**29-32 °C**
Temperature, night	**20-24 °C**
Humidity	**60-80%**
Water	**Water section**
UVB	**Recommended** Ferguson zone 1
Diet	**Insects, vertebrates and worms/snails**
Kept	**Singly**

BREEDING

Reproduction	**Egg-laying**
Development	**Tadpoles in water**
Egg-laying site	**In water**
Eggs per clutch	**3,000-4,000**
Hatching	**2-3 days** at 24-27 °C
Larval period	**14-35 days** from hatching to metamorphosis
Larval diet	**Algae/plants, complete diet and other tadpoles**
Parental care	**Guards the eggs**

PROTECTION AND PAPERWORK

CITES	**Not listed**
IUCN	**Least Concern (LC)**

About the species

Pyxicephalus adspersus is a broad, powerful frog with a large head, an enormous mouth and short, stout limbs. The back is lime green to dark olive green with irregular, broken longitudinal skin ridges. The belly is white to cream, and there are often orange patches where the legs meet the body. The male has a yellow to orange throat, the female a paler, cream-coloured throat. Juveniles are far more colourful than adults, with a mottled pattern and white to yellow stripes down the back that fade with age.

The species is among the largest frogs in the world, and unusually for frogs, the male is the larger sex. Males reach 12-25 cm from snout to vent and can weigh up to 1.4 kg, while females only reach 9-14 cm. The lower jaw has two tooth-like bony projections, odontoids, which hold on to prey. They make *P. adspersus* one of the few frogs that can deliver a truly painful bite. On the hind feet there is a hard, sharp tubercle that the frog uses to dig itself down backwards.

The species was described by Tschudi in 1838. It has long been confused with *Pyxicephalus edulis*, and the boundary between the two, including where their ranges end, is not entirely settled. *Pyxicephalus angusticeps* from the coastal lowlands of East Africa was recognised as a separate species again in 2013.

Toxic skin has not been described in the species, and the skin is therefore not regarded as toxic. The real risk is the bite: a large male bites hard and can cause painful wounds, and the frog will also snap at fingers that resemble food. Always wash your hands after contact with the animal, the water and the substrate.

Distribution and habitat

Pyxicephalus adspersus occurs across much of southern and eastern Africa: Angola, Botswana, Kenya, Malawi, Mozambique, Namibia, South Africa, Tanzania, Uganda, Zambia and Zimbabwe. It may also occur in the Democratic Republic of the Congo. In Eswatini it has disappeared.

The range is not sharply defined, because the species has been confused with its closest relatives. A much larger area used to be included, but it probably covers several species. The map shows the countries listed in recent overviews.

> **Native range:** Angola, Botswana, Kenya, Malawi, Mozambique, Namibia, South Africa, Tanzania, Uganda, Zambia and Zimbabwe.

HABITAT

The species lives in open country: moist and dry savanna, dry scrub, grassland, semi-desert and fields with temporary pools, marshes and ditches. It occurs from the lowlands up to the high veld and tolerates both long dry spells and cold winters.

Its life follows the rainy season. In the dry season the frog digs down and goes dormant, often for months and sometimes for more than a year. It sheds several layers of the outer skin without discarding them, so that they form a tight cocoon around the whole body, leaving only the nostrils free and greatly limiting water loss. When the rain comes, the water softens the cocoon and the frog digs its way up. Adults often have one fixed burrow and hunt within about 20 m of it.

Care

THE ENCLOSURE

An adult male needs an enclosure of at least 90 × 45 × 45 cm, while females and juveniles can make do with slightly less. Floor area matters more than height, because the species does not climb. Large plastic tubs of the same size can also be used: they are cheap and practical and give the animal peace, but you see less of it. *P. adspersus* is more active than its reputation suggests and readily comes out at night to walk about and swim, so the space gets used.

The substrate must be deep and loose so the frog can bury itself completely: at least 10-15 cm of coconut fibre or unfertilised soil with sphagnum and leaf litter on top. Avoid gravel and small stones, which can be swallowed along with food. A good set-up is a paludarium with roughly 70% land and 30% water, separated by a glass pane sealed with aquarium silicone, with a drainage layer under the land section so the soil does not become waterlogged. Add cork bark, flat stones and plants so the animal has cover.

The lid must fit securely, because the frog is strong. Always keep males separately: they are territorial and can kill each other.

Read more: Terrarium construction and bioactive substrate

TEMPERATURE

During the day the enclosure should sit at 24-28 °C with a warm side of 29-32 °C, and at night it may drop to 20-24 °C. The cool side may be slightly above room temperature, so the animal can choose for itself. Heat can come from a weak heat bulb at one end of the lid or a heat mat on the side of the enclosure, always controlled by a thermostat. Switch the heat bulb off at night, and do not use coloured night lights, which disturb the frog's daily rhythm.

Measure with a digital thermometer at both ends. If it stays too cold or too dry for long, the frog will dig down and go dormant. This is natural, but undesirable in ordinary husbandry, and new keepers should not deliberately induce a dry-season rest.

Read more: Heat and temperature

HUMIDITY AND MISTING

Humidity is kept at 60-80%. It comes mostly from the damp substrate and the water section, and the whole enclosure can be misted with dechlorinated water as needed. The substrate should be damp but not wet, and must never dry out completely, because then the frog will dig down and form a cocoon. A digital hygrometer shows whether the level holds, and ventilation should be good enough that the air does not stand still.

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

The frog bathes and swims readily and must always have access to water. A permanent water section or a large, shallow tub where the whole animal can lie with water up to its chin and easily climb out again is the minimum. In a deeper water section, add stones, bricks or gravel so there are shallow areas and easy access to land. The exact water depth for ordinary husbandry is not documented.

Amphibians continually excrete a little ammonia through the skin, so a sponge filter or a turtle filter is a good idea. Without a filter, the water must be changed and the tub cleaned every day, and always when the frog has fouled it. Use tap water treated with a water conditioner against chlorine and chloramine, and clean the tub without soap.

LIGHTING AND UVB

The species is most active at dusk and at night and does not need strong light, but it must have a clear difference between day and night: 12-13 hours of light in summer and about 11 hours in winter. UVB is recommended, because it aids vitamin D3 synthesis and calcium uptake. Use a low-output UVB tube (Ferguson zone 1) at one end, so the frog can seek shade. Glass and plastic block UVB, so a window does not count.

Read more: Lighting and UVB Read more: Calcium, vitamins and supplements

FEEDING

Pyxicephalus adspersus is a predator and eats almost anything that fits in its mouth: insects, worms, snails and, in the wild, also rodents, reptiles, birds and other frogs. In captivity, earthworms make a good staple, supplemented with large crickets, locusts, cockroaches, morio worms, silkworms and hornworms. Buy earthworms from breeders, not fishing worms, which may contain chemicals. Feeder insects should be slightly smaller than the frog's head.

Young animals under 8 cm are fed daily with suitably sized crickets, adults 2-3 times a week. Mice are fatty and hard to digest and should be given no more often than every second or third week. Obesity is the biggest problem in captivity, because the frog never stops eating on its own. Keep an eye on the animal's shape.

Dust the food with calcium and D3 at every feeding for juveniles and once a week for adults, and give a multivitamin once a week. Always use long tweezers, because the frog snaps at anything that moves, including fingers.

Read more: Feeder animals: keeping and breeding

BEHAVIOUR AND HANDLING

The animal often lies buried with only its eyes and nostrils above the substrate, waiting for prey, but comes out at night to hunt and swim. It is not an animal for handling: stress is unhealthy, and the bite is hard. If the frog feels threatened, it puffs itself up, hisses and may lunge forward with its mouth open.

Males must always be kept separately. Females can possibly be kept together, but as the species eats smaller conspecifics, most are kept singly. If the animal has to be moved, use a container or nitrile gloves, take a firm but calm hold of the body, and be quick. The frog is heavy and clumsy and is easily injured if dropped. In the rainy season the male calls with a deep, rumbling call lasting about a second.

Breeding

SEXUAL MATURITY AND SEXING

The sex can normally be seen when the animals are around 10 cm. The male grows much larger than the female, has a proportionally larger head and a yellow to orange throat, while the female's throat is cream-coloured. Only the males call. When the animals reach sexual maturity in captivity is not documented. Wait until they are fully grown and in good condition.

MATING

In the wild the species breeds explosively after the dry season, typically when about 65 mm of rain has fallen over two days. The animals gather in temporary pools. The largest males hold the middle of the pool and fight over the spot, sometimes so fiercely that one of them dies. The female swims at the surface, dives past the small males at the edge and surfaces beside a large male in the middle. Mating lasts only about 15 minutes.

Breeding in captivity is rare. The best method is to imitate the seasons: well-fed, healthy animals are given a 3-4 month dry rest with no misting and little or no water, so they can form a cocoon. Afterwards the enclosure is misted heavily and water is poured onto the substrate. Once the frogs have shed the cocoon, they are fed generously for up to a week and placed in a rain chamber with about 8 cm of water and places to climb out. The water must not be deeper, because the pair stand on the bottom and the eggs are fertilised at the surface. Introduce only one male at a time, preferably when a low-pressure system moves in. Breeding requires that you have homes lined up in advance for thousands of young.

EGGS AND TADPOLES

The female lays 3,000-4,000 eggs at a time in the shallow water at the edge of the pool. At 24-27 °C they hatch within 2-3 days, and after a few days the tadpoles begin to eat plants, small animals and each other. They gather in large shoals.

The male guards the eggs and tadpoles and bites at anything he perceives as a threat. If the pool dries up, he digs a channel to larger water. He does, however, eat some of them himself. In captivity the tadpoles are omnivorous and can be fed fish flakes or commercial tadpole food. Sort them by size, and feed generously to limit cannibalism.

Read more: Rearing tadpoles

METAMORPHOSIS

The eggs hatch after 2-3 days, and the tadpoles metamorphose after 2-5 weeks, most often after about three weeks in the wild and a month in captivity. When the front legs break through, the water must be shallow enough for them to rest with their noses above the surface, and there must be easy access to land. The newly metamorphosed froglets quickly leave the water and seek out holes and damp hiding places, where they are safe from the larger frogs.

REARING THE YOUNG

The young are cannibals from the first day and must be kept separately as soon as they have left the water. Give them small boxes with a damp substrate and leaf litter as cover. Feed daily with suitably sized crickets, and dust the food with calcium and D3 at every feeding. They grow quickly and are moved to larger containers as they go. The number of young from a single clutch is the biggest practical problem when breeding the species.

Health and common mistakes

Pyxicephalus adspersus is hardy, but there are some typical problems:

- Obesity, when fed too often or with too much fatty food such as mice.
- Metabolic bone disease from too little calcium and D3. Dust the food, and consider UVB.
- Skin infections and bacterial diseases from dirty water or a dirty substrate.
- Constipation from swallowed substrate or prey that is too large.
- Bloating and fluid retention, which can be a sign of infection or a poor diet.
- Unwanted dormancy with a cocoon when the enclosure becomes too dry or cold. Raise humidity and temperature gradually.

See a vet with amphibian experience if the frog loses weight, swells up, has red or sore areas, or stops eating without being dormant.

Read more: Common diseases and signs of illness Read more: Brumation and the seasons

Always ask someone who knows

This guide is a good place to start, but it cannot replace experience. Animals differ, and much of what matters most is learned from people who have kept the species for years. Talk to a breeder, an experienced keeper or a vet who knows reptiles and amphibians before you get the animal - and again if anything looks wrong.