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FROGS

Bubbling Kassina

Kassina senegalensis

A small, compact frog with large eyes and a grey-black back with brown longitudinal bands. It lives in savannas and wetlands across large parts of Africa south of the Sahara. *Kassina senegalensis* walks and runs rather than hops, is active at dusk and at night and is known for an explosive, bubbling call.

Family: Hyperoliidae Former name: *Cystignathus senegalensis* **Mild skin toxins**

KEY FACTS

THE ANIMAL

Adult size	**3-4 cm** snout-vent length
Lifespan	**10 years**
Active	**At dusk and at night**
Lifestyle	**Terrestrial and burrowing**
Habitat	**Savanna and wetland**
Skin toxins	**Mild** Wash your hands after contact and keep your fingers away from your eyes and mouth
Difficulty	**Intermediate**

CARE

Min. enclosure	**60 × 40 × 40 cm** L × W × H for 3 adults
Temperature, day	**24-27 °C**
Temperature, night	**20-23 °C**
Humidity	**50-80%**
Water	**Water dish** depth 5 cm
UVB	**Optional** Ferguson zone 1
Diet	**Insects**
Kept	**In pairs or in groups**

BREEDING

Reproduction	**Egg-laying**
Development	**Tadpoles in water**
Egg-laying site	**In water**
Eggs per clutch	**100-600**
Hatching	**5-6 days**
Larval period	**50-90 days** from hatching to metamorphosis
Larval diet	**Algae/plants and complete diet**
Parental care	**None**

PROTECTION AND PAPERWORK

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

About the species

Kassina senegalensis is a small, sturdily built frog in the family Hyperoliidae. Adults reach up to about 4 cm from snout to vent, and the males are slightly smaller than the females. The head is shaped like a rounded triangle with large, slightly protruding eyes, and the body is smooth. The ground colour is grey-black with brown longitudinal bands and spots of the same colour, including around the ears and eyes. Fingers and toes have no webbing. The males have a chocolate-brown vocal sac, which can swell to almost double its normal size when they call.

The species was described in 1841 by Duméril and Bibron as *Cystignathus senegalensis* from animals collected in Senegal. In 1853 it was placed in the newly created genus *Kassina*, where it still stands. Several species names and eight proposed subspecies have since been merged with it. In the northern parts of the range, in Kenya and Tanzania, the boundary with the closely related *Kassina somalica* has not been fully resolved.

Its behaviour sets the species apart from most other frogs: it moves mostly by walking or running rather than hopping, and it digs down or hides under stones and logs in the dry season. The call is a short, explosive "boip" that can be heard from a long way off.

The skin contains defensive substances. Among other things it secretes the peptide kassinakinin S, which gives predators that eat the frog a painful inflammatory reaction. How the substances act on humans is not documented, so the skin toxin is regarded as mild: wash your hands before and after contact, and keep them away from eyes, mouth and wounds. The substances are produced in the skin itself, and there is nothing to suggest that captive-bred animals lack them. Lifespan in captivity is not documented for the species. About 10 years is known from the larger, related *Phlyctimantis maculatus* and is an estimate.

Read more: Buying animals: captive-bred, wild-caught and transport

Distribution and habitat

Kassina senegalensis is found over a very large part of Africa south of the Sahara: from Senegal in the west to Ethiopia and Somalia in the east and all the way down to South Africa. It is common in large parts of West Africa from Senegal to Nigeria and Cameroon, in East Africa from Ethiopia and Somalia to Tanzania and throughout southern Africa from Angola and Mozambique to South Africa, Eswatini and Lesotho. In several countries, including Burundi, the Democratic Republic of the Congo, Guinea-Bissau, Mauritania and Togo, its occurrence is uncertain.

In South Africa the species is common in all provinces except the Western Cape, the western Eastern Cape and the central and western Northern Cape. It is among the most widespread frogs in the region.

The range is so large that the species is not regarded as threatened. The population is estimated to be very large, and the species occurs in many protected areas.

> **Native range:** Senegal, Gambia, Guinea, Côte d'Ivoire, Ghana, Benin, Nigeria, Mali, Cameroon, Central African Republic, Congo - Brazzaville, Sudan, South Sudan, Ethiopia, Somalia, Uganda, Rwanda, Kenya, Tanzania, Angola, Zambia, Malawi, Mozambique, Zimbabwe, Namibia, Botswana, South Africa, Eswatini and Lesotho.

HABITAT

The species lives in open landscapes: dry and moist savanna, mountain meadows and scrub, wetlands and cultural landscape such as pasture and canals. It is found from the lowlands up to about 2,000 metres.

It breeds in both temporary and permanent waterholes. Because the tadpoles develop slowly, these are most often waterholes that hold water for a long time, for example shallow, vegetated ponds, marshes and dams. The breeding season runs from spring to late summer, in the rainy season. By day the adults hide under plants and stones or in burrows. In the late afternoon they walk towards the breeding site, and at dusk the males begin to call, first some distance from the water and later close to the edge, hidden under vegetation. If the weather is wet, they also call by day.

In the dry season the species rests in hiding under logs and stones, in termite mounds and in dug tunnels. After the breeding season the animals may have moved more than 1,000 metres away from the waterhole to find winter shelter.

The males call mostly at sunrise and sunset and preferably at 23-27 °C. Above 30 °C activity falls markedly. Precise figures for humidity at the habitat are not documented.

Read more: Humidity, misting and ventilation Read more: Rearing tadpoles

Care

THE ENCLOSURE

Little direct knowledge exists about the care of *Kassina senegalensis*. The species is nevertheless regarded as easy to keep, and the recommendations here are based on the habitat and on the closely related *Phlyctimantis maculatus*. The terrarium dimensions are borrowed from it and scaled down, because *K. senegalensis* is smaller.

Three adults need a terrarium of at least 60 × 40 × 40 cm (length × width × height). A large floor area is more important than height, because the species lives mostly on the ground and walks rather than climbs. A group of five to six animals needs at least 80 × 40 × 40 cm. Use glass or PVC, because wood does not tolerate the moisture, and preferably choose a terrarium with a front door, so the animals do not jump up towards an opening in the top. The lid must fit tightly and have ventilation.

The substrate must be 8-10 cm deep, so the frogs can dig down: coconut fibre, peat or bark with a layer of moss on top that holds moisture. Provide both damp and drier areas. Cork bark, roots, stones and dense planting provide cover, and a screened back wall makes the animals feel secure. The plants must be robust and tolerate moisture, for example philodendron and golden pothos. Rinse them thoroughly, and let them stand outside the terrarium for a few weeks so remnants of fertiliser and pesticides disappear. Leave most of the floor free. Remove droppings, dead plant material and food remnants every day. Use only clean water for cleaning, never cleaning products.

TEMPERATURE

By day the temperature should be 24-27 °C, and at night 20-23 °C. The temperature must not exceed 30 °C, because the species becomes stressed and inactive in the heat. The daytime lamps often give enough warmth that the terrarium needs no extra heating. Provide several perches under the lamp, but keep the animals away from the bulb itself to avoid burns.

If the terrarium needs extra heat, a weak heat mat on the side or a heating cable in the bottom is better than a powerful heat bulb. Measure the temperature in several places with a digital thermometer, and place the terrarium away from direct sun and draughts. Signs of too low a temperature are loss of appetite and hunched animals, and signs of too high a temperature are animals sitting restlessly and drying out.

For breeding, follow the wild alternation between a dry and a wet period: a dry period of two to three months followed by a wet period. Temperature and light are not changed along the way.

Read more: Heat and temperature

HUMIDITY AND MISTING

Humidity should be 50-80%, lowest by day (about 50-70%) and higher at night (about 70-80%). The figures are borrowed from the related *Phlyctimantis maculatus*. Mist the terrarium every evening with lukewarm, clean water, and keep the air moving with ventilation so it does not become stagnant. After the night's moisture, the condensation on the glass and plants should dry away during the morning. If it does not, the ventilation is too poor.

The substrate must always be moist in depth, because the animals dig down. In a dry period used for breeding, the substrate is still kept moist, but misting is reduced. If it is too dry, animals sit hunched and dry out, and misting must then be increased at once.

WATER AND WATER QUALITY

Place a dish or a small body of water at least 5 cm deep in the terrarium, and keep it clean at all times. The water may take up no more than about a quarter of the floor area. Give the animals an easy way up and down with stones, bark or a branch, so none drown, and do not make steeply sloping edges.

The water must be pH-neutral, low in lime and free of chlorine and chloramine. Use tap water with a water conditioner, rainwater or reverse-osmosis water with added minerals. Change the water every day, and remove dead feeder insects and droppings at once. Amphibians absorb water and dissolved substances through the skin, so soap, cream, hand sanitiser and cleaning products must not come into contact with the water or the terrarium. Rinse the dish with clean water without soap.

LIGHTING AND UVB

The species is active from dusk and at night, but lives in open, bright landscapes, and a bright terrarium with fluorescent tubes or LEDs of 5,000-6,500 K along the whole length of the terrarium is a good starting point. The light is switched on 12-14 hours a day on a timer.

A need for UVB is not documented for the species, so UVB is optional. A fluorescent tube with low UVB output (Ferguson zone 1) on one side of the terrarium is a reasonable addition, so the animals can choose shade in the rest. When the main light is switched off, a weak moonlight lamp of about 15 W can make it possible to see the animals when they become active and go hunting.

Read more: Lighting and UVB

FEEDING

The species is a versatile hunter that takes insects and other arthropods the size of its head or smaller. In the wild the food is mostly grasshoppers and crickets, ants and spiders and also termites, larvae and flies, with no fixed size preference.

In the terrarium the staple is small crickets of 6-10 mm, supplemented with flying fruit flies, houseflies and small moths. Young frogs are fed every day with fruit flies and very small crickets. Adults are fed two to three times a week with so much that everything is eaten overnight. Allow 3-6 crickets per frog per feeding. If feeder insects are left in the morning, too much has been given, and they must be removed so they do not bother resting frogs. Dead feeder insects must be moved with tweezers, otherwise the frog does not recognise them as prey.

Dust the food with a phosphorus-free supplement with calcium and D3, and use a supplement with vitamin A in the form of retinol instead of beta-carotene. Dust every other feeding, and more often for young animals. Discard opened supplements after three to six months.

Read more: Feeder animals: keeping and breeding Read more: Calcium, vitamins and supplements

BEHAVIOUR AND HANDLING

Kassina senegalensis is crepuscular and nocturnal. By day the animals sit or dig down in hiding, and at night they go hunting, run on the ground and call. The gait is characteristic: the frog walks or runs instead of hopping.

The males call loudly, especially at sunset and sunrise and often after misting, so the terrarium does not belong in a bedroom. They have two types of call, a short call and a longer, pulsing territorial call. The call defends a spot, so a terrarium with many hiding places reduces conflict.

The species can be kept in pairs or in a small group. Take care to keep animals of roughly the same size together, because larger frogs may eat smaller ones. The frogs should preferably not be handled, because the skin is delicate and absorbs substances from the hands, and the skin's defensive substances can irritate. Move them by letting them run into a small container. If handling is necessary, hands must be wet and clean without soap, and are washed thoroughly with soap afterwards.

Breeding

SEXUAL MATURITY AND SEXING

The males are slightly smaller than the females and have a chocolate-brown vocal sac that swells to almost double when they call. The females are larger and rounder, especially when full of eggs. Age and size at sexual maturity are not documented for the species. For breeding, a group with a couple of males and several females is a good starting point, so the males' calls can trigger mating.

MATING

The species breeds from spring to late summer, when the rains set in. In the terrarium this is imitated by first keeping a dry period of two to three months with a moist substrate but less misting, and then a wet period with 80-100% humidity, achieved by misting several times a day. Lighting and temperature are not changed. Feed generously until the females are clearly full of eggs.

The males begin to call at dusk. The mating embrace (amplexus) is usually taken on land, and the pair then moves towards the water. The method is borrowed from *Phlyctimantis maculatus*.

EGGS AND TADPOLES

The eggs are laid in water, where they either stick to aquatic plants, stones and other objects or sink to the bottom. The female lays 100-600 eggs in total, 1-15 at a time in many places about 30 cm apart and at a depth of 1-6 cm. The male sits behind the female and fertilises the eggs one at a time. Each egg is 1.4-1.8 mm in diameter and surrounded by a jelly capsule of about 3 mm. There is no parental care: the parents do not look after eggs or tadpoles.

For egg laying, the group must be moved to a terrarium or an aquarium with 5-15 cm of water and aquatic plants, branches and cork bark that stick up above the water, so the animals can get up and down. Change at least half the water every week. Fish in the water stop egg laying altogether, so the water must be free of fish.

The tadpoles are large and have broad fins and a hump-backed body. They reach up to about 75 mm long and can look quite different from one another. Give algae, finely ground fish flakes and crushed aquatic plants, as for *Phlyctimantis maculatus*. Keep the water clean and the temperature stable, and avoid overfeeding.

METAMORPHOSIS

The eggs hatch after about 5-6 days. The tadpoles develop slowly, and metamorphosis is complete after 50-90 days. When the forelegs appear, the tadpoles must have access to land: lower the water level, put out floating bark or stones, and move the little frogs to a small, ventilated plastic box with no more than 1 cm of water and some leaves to rest on. The tail is absorbed within a few days, and only then should they be fed. Make sure the newly metamorphosed frogs do not drown.

REARING THE YOUNG

The newly metamorphosed frogs are very small and need very small, live feeder insects: fruit flies and crickets about a week old, dusted with supplements at every feeding. Feed them every day, and keep an eye on the smallest, who may be outcompeted. Sort them by size into separate boxes. Keep the young in ventilated plastic containers with a moist substrate, leaves to sit on and light misting. Move them to a larger terrarium when they can take larger prey, and put them only with frogs of the same size. Growth and time to sexual maturity are not documented for the species.

Health and common mistakes

The species is hardy, but can suffer the same problems as other frogs in the terrarium. The typical faults are:

- Thin or starved animals after transport. Choose animals with a plump body, and feed regularly for the first weeks.
- Lack of calcium and vitamins, which shows as weakness, bent legs and tremors. Use a phosphorus-free supplement with calcium, D3 and vitamin A in the form of retinol.
- Poor water quality, which can cause skin and fungal problems. Change the water daily, remove dead feeder insects, and avoid chlorine, soap and other chemicals.
- Too low humidity or too much heat, which dries out the skin. Keep the humidity at 50-80% and the temperature below 30 °C.
- Stress and frightened animals that injure themselves when they dash about. Use a terrarium with a front door, and open it calmly.

A healthy animal is alert, has smooth skin without scrapes and a plump body. See a vet with amphibian expertise if a frog loses weight, does not eat, has sores, swellings or red skin, or sits limp and sluggish.

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.