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AGAMAS

Eastern Garden Lizard

Calotes versicolor

Calotes versicolor is a slender, fast arboreal agamid from South Asia that can change colour from brownish to yellow, red and almost black, and in the breeding season the male acquires a bright red head. It reaches 30-40 cm, is diurnal and feeds mostly on insects. It requires a tall enclosure with branches, strong heat and UVB, and there must be only one male in each enclosure.

Family: Agamidae Former name: *Agama versicolor; Agama indica; Calotes cristatus; Calotes gigas; Agama tiedemanni*
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KEY FACTS

THE ANIMAL

Adult size	**30-40 cm** total length incl. tail
Lifespan	**10-15 years**
Active	**By day**
Lifestyle	**Arboreal**
Habitat	**Savanna and dry forest**
Difficulty	**Intermediate**

CARE

Min. enclosure	**120 × 60 × 120 cm** L × W × H for 1 adult
Temperature, day	**24-29 °C**
Basking spot	**35-40 °C**
Temperature, night	**21-24 °C**
Humidity	**60-80%**
Water	**Water dish**
UVB	**Essential** Ferguson zone 3
Diet	**Insects and plants**
Kept	**Singly, in pairs or one male with several females**

BREEDING

Reproduction	**Egg-laying**
Sexually mature	**7-12 months**
Clutch size	**7-33 eggs**
Clutches per year	**1-3**
Incubation	**47-80 days** at 27-31 °C

PROTECTION AND PAPERWORK

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

About the species

Calotes versicolor is a slender agamid with a long, tapering tail, an angular head and a crest of scales along the nape and back. In the male the crest is strong and continues all the way down to the tail. Above each tympanum there are two small, separate spines. The ground colour is light brown, greyish or olive brown, often with dark crossbands and spots on the flanks, and dark stripes radiate from the eye. Females and young animals have more distinct bands and often two pale stripes along the back.

The species is known for its ability to change colour. It can go from light brown to red, yellow or almost black, sometimes only on the head and neck, other times over the whole body and tail. In the breeding season the male acquires a bright orange to red head and shoulders and a black throat, and the male also turns red after winning a fight with a rival. The female becomes a more subdued reddish on the forebody. At about six months of age both sexes acquire dark spots on the side of the neck.

The animal reaches 30-40 cm including the tail, and the tail makes up about two thirds of the length. The female's body (snout to vent) measures 8-15 cm, and males grow larger than females. Animals from Sri Lanka are on average slightly larger than animals from the mainland. As in other agamids the tail cannot be shed.

The taxonomy is in upheaval. *C. versicolor* was long regarded as one species from Iran to China and Indonesia, but it is a complex of several species. Since 2021 *C. versicolor* in the narrow sense has been regarded as a species in southern India and along India's east coast north to the Mahanadi River, perhaps also on Sri Lanka. The animals in central and northern India have been separated as *Calotes vultuosus*, the animals in northern Pakistan as *Calotes farooqi*, and in north-eastern India and South-East Asia the closely related *Calotes irawadi* and *Calotes htunwini* are found. The name *C. versicolor* is still used for the whole complex, also in the trade, and the origin of the animals is seldom known. Care is the same.

The species is nervous when new, but gets used to its surroundings. It is not an animal to be picked up every day, and the male defends his territory vigorously against other males. Lifespan in captivity is poorly documented; figures go up to 10-15 years.

Distribution and habitat

Calotes versicolor in the broad sense has a very large range in South and South-East Asia: from south-eastern Iran and Afghanistan through Pakistan, India, Nepal, Bhutan, Bangladesh and Sri Lanka to Myanmar, Thailand, Cambodia, Vietnam, southern China with Hainan, western Malaysia and Sumatra. The map shows this area.

In the narrow sense the species lives only in southern India and along the east coast north to the Mahanadi River, and perhaps on Sri Lanka. The rest of the area belongs to closely related species in the complex (see the description).

The species has been introduced in several places outside its native range, including the Maldives, Seychelles and Mauritius, in Oman and in Florida, where it can displace the native lizards.

> **Native range:** India, Sri Lanka, Nepal, Bhutan, Bangladesh, Pakistan, Afghanistan, Iran, Myanmar (Burma), Thailand, Cambodia, Vietnam, Malaysia, Indonesia and China.

HABITAT

The species lives in hedgerows, scrub, gardens, forest edges and open landscape with bushes and trees, and it does well in towns and villages. It climbs quickly up trunks and branches and also uses walls, poles and fence posts. It often sits on a branch, a wall or a post and basks with its mouth open, and when a predator approaches, it flees up a tree and moves around to the side of the trunk facing away.

It is diurnal and hunts from a lookout point. After downpours many come down to the ground to collect larvae and insects that have fallen from the trees. The climate is tropical to subtropical with a distinct rainy season, and the breeding season follows the rainy season: in southern India from May to October. In the dry South Indian highlands active animals have a body temperature of about 37 °C in summer, and in a temperature gradient they choose 26-30 °C. The species tolerates both high and fairly low temperatures and is common and not threatened.

Read more: Heat and temperature

Care

THE ENCLOSURE

An adult *C. versicolor* needs an enclosure of at least 120 × 60 × 120 cm (length × width × height). It is an arboreal species, so height is just as important as floor area. A male with two or three females needs at least 150 × 120 × 120 cm. Large and tall is better.

Furnish with many branches of different thicknesses and angles, cork, bark, a back wall with climbing opportunities and live or artificial plants, so that the lizard can get up high and hide. It prefers to sit high up. A mixture of soil and sand, which is also used for egg-laying, suits as substrate. The enclosure must have good ventilation so that the air does not become stagnant, and the lid must close tightly, because the species is fast and jumps.

Potted plants provide cover and a little plant food. Remove droppings and food remains daily, and replace the substrate completely at regular intervals.

TEMPERATURE

The species needs a distinct gradient. The daytime temperature in the enclosure should be 24-29 °C, and at the basking spot there should be 35-40 °C. At night there should be 21-24 °C. Place the basking spot high up on a branch, where the lizard will naturally sit, and make sure it can always move away from the heat. The preferred body temperature is 26-30 °C, and active animals in the wild reach about 37 °C.

Use a halogen spotlight or another heat lamp over the basking spot, shielded with a grille so that the animal does not burn itself. Measure the surface temperature at the basking spot with an IR thermometer and the air with thermometers at the warm and the cool end. Too low a temperature slows the metabolism and causes poor digestion and appetite. At night the heat is switched off, and the temperature may follow the room as long as it does not fall below 21 °C.

HUMIDITY AND WATER

Relative humidity should be 60-80 %. This is achieved by misting the enclosure lightly once or twice a day and letting the substrate and plants dry partially between mistings. The lizard drinks water droplets from leaves and branches, so misting also provides drinking water.

Also place a shallow bowl of fresh water in the enclosure, so shallow that the animal can easily climb out of it. Change the water daily. If the air is persistently too dry, the animal gets problems with shedding.

Read more: Humidity, misting and ventilation

LIGHTING AND UVB

The species is diurnal and basks, so it needs strong light and UVB. Use a UVB tube of 6-10 % (T5 HO) over the basking spot, corresponding to Ferguson zone 3; the zone has not been measured for the species, but suits other diurnal agamids that bask in open country. The target is a UV index of 3-5 at the basking spot and lower further down. The distance between tube and animal depends on the tube and fitting and is checked with a UV meter. The tubes are replaced according to the manufacturer's instructions, because the UVB output falls long before the tube stops lighting.

Switch the light on for about 12 hours a day. Heat lamps do not give UVB and cannot replace the tube.

Read more: Lighting and UVB

FEEDING

C. versicolor is first and foremost an insectivore. In the wild it eats ants, beetles, dragonflies, grasshoppers and other insects, and it also takes small vertebrates such as other lizards, geckos and young rodents. Plant food makes up only a small part.

Give varied live food no larger than the distance between the animal's eyes: grasshoppers, crickets, cockroaches, silkworms and larvae, with mealworms and waxworms as supplements. Offer a little leafy greens, which some animals take. Small vertebrates are not necessary.

Young animals are fed daily, subadults and adults every other day. Dust the feeder insects with calcium at most feedings and with a vitamin and mineral supplement once a week. Give the insects nutritious food the day before. Reduce the amount of food if the animal becomes fat. Offer the food high up in the enclosure, so that the animal can hunt from its lookout post.

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

BEHAVIOUR AND HANDLING

The species is nervous when new, but gets used to calm surroundings. It is fast and can slip out when the lid is opened. Give a new animal a couple of weeks in peace. It is suited to watching rather than frequent handling, and if it has to be picked up, support the body and never grab the tail.

The males are strongly territorial. They nod their heads, do push-ups, inflate the throat and show a red head to rivals, and they can injure each other. There must therefore be only one male in each enclosure. A male with two or three females in a large enclosure works, but requires supervision, and if there are bites or wounds, the animals must be separated. Signs of stress are persistent dark colours, escape attempts and refusal to feed.

Breeding

SEXUAL MATURITY AND SEXING

The male has a stronger crest that continues down over the back, a larger and broader head and a thicker tail base. The female has a lower crest and is more subdued in colour. The male's bright red head and black throat are most distinct in the breeding season.

The species grows quickly and becomes sexually mature at only 7-8 months of age, when males measure about 9 cm and females about 8 cm from snout to vent. Some females breed only in their second or third year and are then larger and lay more eggs. Put animals to breeding only when they are in good condition.

MATING

The breeding season follows the rainy season and falls in southern India from May to October, further north in the monsoon from June to September. No particular rest period before the breeding season is documented. The male acquires a red head and black throat and displays to the female with nods and an inflated throat.

Put the female with the male in a large enclosure and keep an eye on them so that the female can get away if the male becomes too violent. Mating takes place on branches, and the female quickly becomes gravid.

EGG-LAYING AND CLUTCHES

The female lays 7-33 eggs per clutch, most often 10-20. Young, small females lay fewer eggs (11-15) than larger and older females (20 or more). She can lay up to three clutches in a season at intervals of 25-50 days. The eggs are elongated and have a soft, leathery shell.

The female digs a hole in damp soil, lays the eggs and covers them. The enclosure must therefore have a place with at least 20 cm of damp soil and sand or a laying box. If she lacks a suitable place, she may retain the eggs, and that can be life-threatening. Give the female plenty of food and calcium before and after laying, because many clutches in a row take a heavy toll on her.

INCUBATION

Dig the eggs up carefully without turning them, and place them in a closed container with lightly damp soil, sand or vermiculite with small air holes. Eggs in cotton wool hatch less well than eggs in soil or sand. A temperature of 27-31 °C is suitable. Incubation time depends greatly on temperature: at 31-32 °C the eggs hatch after 55-56 days, at naturally fluctuating temperatures between 22 and 37 °C after 47-48 days, and figures for South Indian eggs go up to about 80 days. At 24-25 °C it drags out to over 80 days, and the young become weak. All the eggs in a clutch normally hatch within three days.

Sex determination is uncertain. In animals from southern India the incubation temperature affects the sex in a shifting pattern, so both low and high temperatures can give a preponderance of females or males. In animals from northern India no connection with temperature has been found.

Eggs that turn yellow, collapse or go mouldy are usually dead and can be removed.

Read more: Incubating eggs

REARING THE YOUNG

The newly hatched young measure about 2-3 cm from snout to vent and 5 cm in total. They are small and fast. Keep them in a smaller but tall and well ventilated enclosure with branches, plants, a basking spot, UVB and the same humidity as the adults'. Feed them daily with small insects such as small crickets, small larvae and fruit flies, dusted with calcium.

Rearing is difficult: many young die in the first months, even in good conditions. The young grow quickly and reach adult size within the first year. Keep them sorted by size, and separate the males as soon as they begin to show colours and territorial behaviour, from about six months of age.

Health and common mistakes

Most problems are caused by mistakes in care: too low a temperature, too little UVB, a one-sided diet and air that is too dry. Typical problems are:

- Bone loss (metabolic bone disease) from too little UVB and calcium.
- Poor digestion and appetite from too low a temperature.
- Shedding problems in air that is too dry.
- Bite wounds and stress in males kept together.
- Difficulty laying eggs and exhaustion in females without suitable digging substrate or with many clutches in a row.

- Parasites in wild-caught animals. The animals in the trade are often wild-caught and should be examined for parasites and quarantined for at least three months.

A healthy animal has clear eyes, an upright posture and is active. Wash your hands after contact with the animal and enclosure, as reptiles can carry salmonella. See a vet with reptile experience if the animal loses weight, does not eat, gapes without basking or seems lethargic.

Read more: Quarantine and hygiene Read more: Common diseases and signs of illness Read more: Buying animals: captive-bred, wild-caught and transport

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.