

Basic information and husbandry guidelines
for *Phelsuma guimbeau*,
Guimbeau's day gecko





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These husbandry recommendations are essentially based on BUDZINSKI (2024), supplemented by information from the CC office and personal communications from Ralph-M. Budzinski, Jürgen Hoch, Elmar Nasse and Markus Roesch.



1. Profile

Scientific Name: *Phelsuma guimbeau* MERTENS, 1963

Common Names: Orange-spotted Day Gecko, Mauritius Lowland Forest Day Gecko, Lowland Forest Day Gecko, Guimbeau's Day Gecko

Total length: Males maximum 15 cm, females 11-12 cm

CC#Reptiles-Category: III (also suitable for beginners)

Endangered status according to the IUCN Red List: „endangered“

CITES protection status: Appendix II

Protected status EU species protection regulation: Appendix B

Terrarium: For one pair terrariums from 40 x 40 x 60 cm (length x width x height). Basic lighting with fluorescent lamps, HQI, LED, or similar; local sun spot provided by metal halide lamps for terrariums with UV component. Basking area, locally up to 42 °C, otherwise 24-30 °C during the day with slight night-time reduction. In winter, lowering to 16-18 °C and reduced lighting duration.

Required equipment: Bamboo poles and smooth branches, plus plants. Soil, e.g. hydroponic clay pellets, soil-sand mixture, potting soil.

Care: Always fresh water from a bird water dispenser, daily spraying.

Feeding: Feed approximately every other day, twice a week in winter. Insects and invertebrates, e.g. crickets, grasshoppers, cockroaches, caterpillars, beetle larvae etc. Always powder with a vitamin-mineral preparation before feeding. In addition, fruit pulp, sweet yoghurt, cream cheese with fruits, flower pollen, and special ready-made food for phelsumas available in stores. Sepia pulp should be available indefinitely.

Breeding: Please note the incubation instructions to achieve a balanced sex ratio.

Life expectancy: approx. 15 years, reproduction up to approx. 10 years.





2. Why is *Phelsuma guimbeau* a Citizen Conservation Species?



Phelsuma guimbeau in its natural habitat
| Markus Roesch

The Guimbeau's daycko, *Phelsuma guimbeau*, is highly endangered in its native habitat, and although there are still small subpopulations in protected areas, its future there is uncertain. There are still enough animals in terrariums to give the species a future through managed conservation breeding. The fact that this gecko has been successfully kept and bred for many years suggests that this is possible. The attractive appearance, the size suitable for private keeping and the not very shy nature of this species will hopefully lead to many fellow campaigners helping to make Citizen Conservation's conservation breeding programme a success.

Phelsuma guimbeau is still classified as "endangered" on the International Union for Conservation of Nature (IUCN) Red List (COLE & BUCKLAND 2021). In reality, however, its situation is probably far more threatening, so there are fears that the species will soon have to be categorised as 'critically endangered' and will die out completely in the foreseeable future. The population trend is stated by COLE & BUCKLAND (2021) as 'declining'.

The main reasons for the critical situation are the large-scale habitat destruction on Mauritius and the introduction of invasive species. Both factors together have already led to a threatening collapse in the population of this gecko in recent centuries, which now only occurs in a few, completely isolated populations, many of which are no longer considered viable (see section 3.2).



In view of the threat situation on Mauritius, the establishment of a reserve population over decades is of great importance for the survival of the species. | Ole Dost



Both of these threats continue to affect the species. On the densely populated island, remnant natural tree populations continue to be converted into settlement areas or plantations that cannot be used by the geckos. And the day geckos, which already occur in low population densities, continue to be directly threatened by introduced species in these remaining habitats. A recently introduced large relative, *Phelsuma grandis*, could prove to be a real game changer. It is currently spreading invasively on Mauritius, taking over all habitats and is much more competitive than *P. guimbeau*. It also acts as a direct predator for the smaller native relative. It is therefore to

be feared that with the further spread of *P. grandis*, the smaller *P. guimbeau* will be completely wiped out in the wild.

The high degree of endangerment of the Mauritius day gecko is therefore beyond question, but the relatively good starting situation in private keeping also makes it a particularly suitable candidate for the Citizen Conservation Programme. According to the offspring statistics of the *Phelsuma* interest group for 2023, there were 23 keepers in this organisation alone, 17 of whom bred the species in 2023. Thus 53 offspring were obtained. Since 1993, a total of 2,300 offspring have been reported within IG *Phelsuma*. As it can be assumed that there are also other successful breeders of *Phelsuma guimbeau* outside the IG *Phelsuma*, it should not be a problem to obtain enough animals for a stable founder population in the long term and to be successful in breeding (BÖHMKE 2024).

In view of the precarious situation in the natural habitat, the terrarium population must therefore be regarded as a valuable reserve population. However, in order for this reserve population to survive in the long term, it is very important to coordinate husbandry and breeding. On the one hand, the loss of genetic diversity in the reserve population can be limited as far as possible, because the mating of the animals can then be controlled according to kinship aspects between the different husbandries. On the other hand, this can prevent the population from becoming over-aged or inadvertently dying out because, unnoticed, there may one day no longer be enough breeding stock.

Citizen Conservation is a coordinated conservation breeding project that aims to counter such dangers typical of uncoordinated husbandry. In addition, animals are easily available for later reintroduction projects via CC if they are needed.

The CC #Reptiles advisory board has set a target population of 110 animals in 55 facilities as the target number for stable conservation breeding over 40 years.



3. Biology und Conservation



One of 53 *Phelsuma* species: Guimbeau's day gecko in its habitat | Markus Roesch



Aerial view of Mauritius in the Indian Ocean | karacacennet, Shutterstock

3.1 Biology

- Systematics

The genus *Phelsuma* consists of 53 relatively similar, mostly diurnal gecko species, which are mainly found on Madagascar, but also on other islands in the Indian Ocean. They belong to the family of true geckos (Gekkonidae).

Until 2004, *Phelsuma rosagularis* was considered a subspecies of *Phelsuma guimbeui*, which it closely resembles in habitus and pattern of markings. Both also share the grey-brown juvenile colouration. However, genetic studies have shown that these two species native to Mauritius are so distant from each other that *Phelsuma rosagularis* must be considered a separate species (AUSTIN et al. 2004). The latter is widespread in the south and east of the island.

- Distribution

The home of *Phelsuma guimbeui*, the island of Mauritius, lies in the south-west of the Indian Ocean about 870 kilometres east of Madagascar. The original distribution area there extended over the lower-lying regions of the entire west of the island from Port Louis to Baie du Cap in the south (VINSON 1976).



Typical biotope of *Phelsuma guimbeaui* in the west of Mauritius | Ralph-M. Budzinski

- Habitat

Phelsuma guimbeaui is a forest dweller. Contrary to previous assumptions, the species is not restricted to the lowland forest, but can be found as far up as the summit of the Piton du Canot at an altitude of 540 metres. It also inhabits tree stands in rather dry and hot regions.

The habitat of *Phelsuma guimbeaui* also includes the driest and hottest areas of the island. Temperatures there can fluctuate between a maximum of 35 °C in January and a minimum of 12 °C on cool June nights. As a strict tree dweller, *Phelsuma guimbeaui* is bound to the presence of continuous, sparse tree vegetation. Although it has accepted exotic tree species introduced by humans, such as *Terminalia arjuna*, *Terminalia catappa*, *Mangifera indica*, *Eucalyptus tereticornis* and *Haematoxylum campechianum*, it cannot survive in a tidy cultivated landscape. Buildings, banana or coconut plantations cannot be used as substitute habitats.



Particularly colourful Guimbeau's day gecko; both sexes can show the colourful markings. | Ralph-M. Budzinski



Darker coloured animal; the colouring can be lightened or darkened within minutes. | Markus Roesch



The juveniles are clearly differently coloured. | Ralph-M. Budzinski

- Appearance

The Guimbeau's day gecko is a medium-sized phelsuma. Males reach a maximum total length of 15 cm, but usually remain smaller. Females are generally smaller with a total length of 11-12 cm. The tail takes up slightly more than 50 % of the total length, which is typical for phelsums. The sexes do not differ in colouration. In their peak colouration, the upper side of the body is a bright emerald green. Depending on their mood, the animals can also darken their colouring considerably within minutes. This can go so far that the geckos look almost black. The neck area is usually bluish in colour. The markings on the back and tail are bright red in colour, at least in wild animals. In terrarium animals, however, these can also be very faded so that they only appear reddish-brown or pale orange. A narrow band runs across the tip of the snout, behind the eye up to the ear opening there is a narrow bar and in front of the eyes another wider horizontal bar. Starting from this, two dorsolateral bands extend over the entire back to the base of the tail. These lines can be continuous or interrupted. A fine line begins median behind the eyes, which can branch out in the nape and thus form a loop-shaped figure. The loop can be completely closed, interrupted or even just a hint of it. Towards the back it runs out again in a

fine line. The southern populations in the natural distribution area usually only have a straight line instead of a loop. On the back and tail there are other markings of various shapes, such as dots, spots or lines. Occasionally you can also find animals with a turquoise blue tail tip or where the scale ring above the eye is also turquoise in colour. The underside of the animals is whitish beige, the throat and cloacal region can be yellow in both sexes. There are usually two to three dark v-shaped markings on the throat, although these can be very faint or completely absent.

The juveniles of *Phelsuma guimbeaui* show pronounced juvenile colouration. After hatching, they are dark brown or grey with fine light and dark mottling. In the course of their first year of life, they change colour, which usually begins with yellow rings around the eyes on the head.



Comparison: underside of thighs and cloaca with clearly visible preanofemoral pores in males (left); these are absent in females (right). | Ralph-M. Budzinski

- Sexual differences

As mentioned above, there are no sexual differences in coloration and markings. However, adult males are longer and more robustly built than females. The heads of males are also noticeably more massive. The hemipenis sacs of adult males are also clearly visible as bulges on the underside at the base of the tail. Adult females often have "calcium sacs" on both sides behind the ear openings, known as endolymphatic sacs, which are used to store calcium for the formation of eggshells.

The most reliable feature for distinguishing between the sexes are the so-called preanofemoral pores. In adult males, a row of clearly enlarged scales can be seen on the underside, extending on each side on the thighs. These enlarged scales have orange-yellow "dots" in the middle that are clearly visible and may protrude like cones. The preanofemoral pores contain glands, and the yellowish cones are the hardened glandular secretions. These serve for chemical communication in connection with reproduction. In females, this row of scales is smaller and without pores and secretory cones.



Phelsuma guimbeau lives strictly attached to trees.
| Markus Roesch



They also like to lick up tree sap.
| Markus Roesch

- Ecology and behaviour

Phelsuma guimbeau is diurnal and lives strictly attached to trees.

Adult Mauritius day geckos live in the upper part of the trees, where they are well camouflaged among the green leaves. The juveniles, on the other hand, are found close to the ground in drier bushes and shrubs; with their greyish, darker colouring, they are just as well camouflaged there as the adults in their habitat.

However, the population density is very low everywhere, so that usually only individual animals or males with one or two females can be observed on the same tree. Studies by Steeves Buckland have shown that the territories of male *Phelsuma guimbeau* were 32-158 m² in size and hardly overlapped with the territories of other males. In contrast, the territories of the females were significantly smaller at 2-68 m² and had more overlap with the territories of other females (BUCKLAND et al. 2014a).

They feed on arthropods of a suitable size, but also on plant food such as pollen, nectar and tree sap. The sugary excretions of aphids (honeydew) are also very popular.



Old male of *Phelsuma guimbeaui*. The geckos can live for 10-15 years in the terrarium. | Ralph-M. Budzinski

- Life expectancy

The geckos reproduce in the terrarium up to the age of about ten years, but the number of clutches per season decreases continuously with increasing age, and there are more single eggs instead of the usual double clutches.

The maximum life expectancy of *Phelsuma guimbeaui* in the terrarium is estimated to be up to around 15 years.



3.2 Threat situation and conservation



Mauritius is densely populated and the natural biotopes are heavily disturbed. | Lostsurf, Shutterstock



The introduced Indian wolf snake is a real threat to Mauritius day geckos. | Ralph-M. Budzinski

Mauritius is very densely populated with around 1.26 million inhabitants over an area of 2,040 km² (619 inhabitants/km²). As a result, a large part of the original distribution area of *Phelsuma guimbeui* is urbanised or used intensively for agriculture. The last areas of retreat in the landscape, which is characterised by extensive sugar cane plantations, are often the tree-covered bands of vegetation that run along small rivers and streams and protect them from drying out. However, due to a lack of profitability, these sugar cane fields are increasingly being converted into building land. It remains to be seen whether the vegetation bands will be preserved in their current form. Due to the profound destruction of the habitat, the occurrences are now highly fragmented and are no longer connected to each other. Only in the south of the distribution area are there still larger contiguous areas, some of which are protected in the Black River National Park.

In a study on the endangerment situation of *Phelsuma guimbeui*, 30 isolated subpopulations were identified (BUCKLAND et al. 2014b). The sizes of the subpopulations calculated using population genetic models were small and varied from 44 individuals in the smallest to 167 individuals in the largest subpopulation. As there is no longer any genetic exchange between most subpopulations, the loss of genetic diversity could lead to the extinction of these subpopulations. Of the 30 subpopulations analysed, only 12 were considered viable for the future.



The introduced Indian garden lizard also hunts geckos.
| Ralph-M. Budzinski



Victim and perpetrator: Encounter of a *Phelsuma guimbeaui* with *Phelsuma grandis* | Ralph-M. Budzinski

Another problem is posed by predators that have been deliberately or unintentionally introduced by humans. All habitats are now home to rats, which are very good at climbing trees and can easily prey on clutches of eggs as well as sleeping geckos. The Indian wolf snake (*Lycodon aulicus*), which is known as a nocturnal lizard eater, is also very common. The Indian garden lizard (*Calotes versicolor*), which preys on young phelsums during the day, is very numerous and present almost everywhere. Some of the introduced bird species certainly also pose a threat to young *Phelsuma*. The influence of the Mauritius falcon (*Falco punctatus*), which is said to favour *Phelsuma guimbeaui* over the more common *Phelsuma cepediana*, probably plays only a minor role due to its rarity. However, the high number of adult *Phelsuma guimbeaui* with tail raptor rates is striking, which indicates high predator pressure.

Since the 1990s, the circle of neozoans has been expanded to include another species that has proven to be very invasive and problematic for the endemic *Phelsuma*: the large Madagascar day gecko, *Phelsuma grandis*. This *Phelsuma* is more than twice the size of *Phelsuma guimbeaui* and is known as a gecko hunter. First and foremost, it probably poses a threat to the young of *Phelsuma guimbeaui*. *Phelsuma grandis* has even been deliberately released in gardens by some Mauritians in order to keep the often unwanted house geckos at bay. In the meantime, it has spread across large parts of Mauritius and has also reached some areas inhabited by *Phelsuma guimbeaui* (BUCKLAND et al. 2014c). It must be feared that the spread will continue and that all habitats of *Phelsuma guimbeaui* will be reached in the near future.



Perhaps the most dangerous threat to the Guimbeau's day gecko at present is posed by the introduced large Madagascar day gecko (*Phelsuma grandis*).
| Ralph-M. Budzinski



The high number of animals with shed tails is evidence of the high predation pressure in their natural habitat.
| Markus Roesch



Former habitat of *Phelsuma guimbeui* that has become uninhabitable due to overgrowth | Ralph-M. Budzinski

In a study, the influence of *Phelsuma grandis* on the population of endemic *Phelsuma* species in their various habitats was investigated. In habitats with *Phelsuma grandis*, the occurrence of endemic *Phelsuma* was 89 % lower than in comparable habitats without *Phelsuma grandis*. In four out of ten habitats with *Phelsuma grandis*, no endemic *Phelsuma* were found at all (BUCKLAND et al. 2014c). In addition to direct hunting, the cause of the disappearance could also be competition for food and favoured habitats, which could lead to a lower reproduction rate in the endemic species. This could explain the observations made by BUDZINSKI (2023) in Casela Park. There, the number of *Phelsuma guimbeui* sighted declined relatively slowly over 15 years after the appearance of *Phelsuma grandis*, while the number of *Phelsuma grandis* steadily increased.

In addition to the threat posed by introduced predators, invasive plants could also become a problem. In some habitats, many of the trees inhabited by *Phelsuma guimbeui* are completely overgrown with climbing plants, causing them to die off due to lack of light. One of these habitats is located in Case Noyale. Years ago, this was a good place to observe and photograph animals of the southern population of *Phelsuma guimbeui*. Now, however, a large part of the trees is completely overgrown by a vigorous vine (presumably *Cissus* sp.) and only very few *Phelsuma* were to be found. Elsewhere, it is not *Cissus*, but funnel bindweed (*Ipomoea cairica*), which has overgrown large areas of trees formerly inhabited by *Phelsuma guimbeui*. This means that these trees are no longer a habitat for *Phelsuma guimbeui*.



4. Keeping and Care

Like almost all *Phelsumas*, the Guimbeau's daycko is a good and relatively easy to keep terrarium pet, even if it is a little more challenging than some other day geckos. Nevertheless, it can also be entrusted to well-prepared beginners, which is why it is categorised as CC category III. However, general terrarium experience and especially experience in phelsum care are an advantage.

These CC husbandry recommendations are were prepared on the basis of the books by BUDZINSKI (2009) and BERGHOF (2014), the article by BUDZINSKI (2024) as well as information from Elmar Nasse, Jürgen Hoch, Markus Roesch and information from the literature.

In addition to these husbandry recommendations, the book 'Der Guimbeau's day gecko, *Phelsuma guimbeui*' by BUDZINSKI & BUDZINSKI (2009, German language) is recommended for all keepers, as are basic works on the genus *Phelsuma* by HALLMANN et al. (2008) and BERGHOF (2014), both German language.



Phelsuma guimbeui can become very handsome. | Ralph-M. Budzinski



4.1 Requirements and documentation obligations

Phelsuma guimbeaui is protected under Appendix II of the Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora, Appendix B of the EU Endangered Species Directive and 'specially protected' under the German Federal Nature Conservation Act. This means that keepers must be able to prove the legal origin of the animals and in Germany register their population and any changes to the population with the responsible local authority. Outside Germany, please find out about the species protection regulations that apply locally.

At CC, keepers always receive the animals with a certificate of origin, which is recognised for deliveries within the EU in order to prove the legal origin. Accordingly, CC breeders must ensure that the 'Proof of origin and handover certificate' form provided by CC is completed in full and signed when handing over their animals.

Not only the origin of the parent animals of the offspring should be stated, but also that of the parents of the parent animals. This ensures complete back documentation. All papers that are handed over within CC or from CC must be emailed to the CC office (reptiles@citizen-conservation.org) immediately as a scan or photo. The obligation to register applies to the owners of the animals, i.e. those who actually keep them, irrespective of the fact that the animals are the property of CC. In Germany, the official notification should be made immediately after the transfer, preferably by submitting a copy of the CC certificate of origin and transfer or adequate proof of origin. Any changes to the

stock must also be reported regularly to the authorities, i.e. both offspring and deaths or transfers.

Different rules apply to imports and exports from or to outside the EU (e.g. Switzerland, Great Britain). Appropriate export and import documents must be applied for in advance. All CC animals are the property of the non-profit Citizen Conservation Foundation gGmbH or are managed by it in trust. This also applies to all resulting offspring (see CC guidelines and recruitment contract). Keepers are therefore not allowed to give or sell the animals or offspring themselves. Offspring are distributed within the project as long as this makes sense in terms of population management. If offspring cannot or should not be distributed within the project, they can be sold outside of the project after prior consultation with the CC office or can be arranged by the CC office. If income is generated, this will go to CC and contribute to the funding of our species conservation programme.



Phelsuma guimbeaui from the Piton Canot. The geckos are internationally protected and must therefore be registered by CC keepers with their competent authority.

| Ralph-M. Budzinski



An essential part of CC is the coordination of our inventory, which is why we must always be informed about its development. CC participants are therefore contractually obliged to submit a stock report twice a year, on 1 March and 1 September. This stock report (number of animals, their sex if possible, animals that have died or bred in the last six months, egg laying etc.) can be submitted online. You will be reminded by the CC office in good time; you will be informed at the same time of the current procedure for submitting the stock report. In addition, we are pleased to receive information on observations and experiences gained in keeping and breeding, as an important aim of CC is to generate knowledge on ex-situ keeping and the biology of the species managed in our conservation breeding network.

We are also always happy to receive photos of animals and their facilities. CC can then use these for publications or social media, for example. Permission to use the images within the framework of the CC programme is deemed to have been granted upon sending them, unless expressly objected to; CC always names the image authorship in publications, unless expressly objected to.

Please also inform the CC office about unusually appearing deaths informally by e-mail to reptiles@citizen-conservation.org between the stock reports, so that further steps can be discussed, such as examinations of other animals in care, a necropsy or veterinary care.

If owners can no longer or no longer wish to keep the animals or offspring, the CC office must be informed as early as possible so that we can place the animals in subsequent homes. Veterinary tests must be carried out in accordance with the requirements of the relevant advisory board whenever animals are moved within CC, i.e. from one person to another. The CC office will provide information on this. Any costs incurred of the tests are borne by CC. A corresponding test order for a suitable test laboratory is available from the CC office.

Under no circumstances should the animals be mated with other phelsums on one's own initiative! It is crucial for the development of long-term conservation breeding that the genetic background of the animals can be traced, which is why uncontrolled mixing with animals from outside must be avoided. It is often desirable from the point of view of studbook management to avoid mixing between generations. So please only use animals selected by the CC office for mating.

In principle, the regulations in the general CC guidelines (<https://citizen-conservation.org/wp-content/uploads/2024/05/CC-Leitlinien.pdf>) and in the recruitment contract apply to all CC animals.



4.2 Transport

You normally receive the animals in the Citizen Conservation #Reptiles programme directly from the breeders or previous owners.

The future owners are responsible for organising the transport themselves; any costs incurred (i.e. travel costs to the breeders, shipping costs if applicable) must be borne by you. The CC office may be able to help arrange shipping - however, in order to minimise the effort and administrative costs, we ask that you organise the transport yourself if possible. Only forwarding agents authorised to transport live animals may be used for shipping; the relevant guidelines for shipping and all legal regulations must be complied with!

Each time the animals are moved, they are given a veterinary examination in accordance with the CC#Reptiles advisory board (see section 4.1). In addition, there is always a risk that pathogens will not be recognised despite examinations.

The usual quarantine rules in terraristics should also be observed by the new owner when taking over CC animals.

For transport, the day geckos are placed individually in sturdy plastic boxes lined with cellulose or kitchen paper; some loosely crumpled kitchen paper or sphagnum moss can also be placed in the box as a hiding place. The boxes are placed in a thermostable container (polystyrene box) to protect them from the weather and to prevent them from slipping, being thrown around or falling over.

In winter or summer, it may be necessary to add a cooling battery or heat pack to the box. Caution - always separate such elements safely from the transport boxes (e.g. wrap in a towel) so that the geckos in their box cannot overcool or overheat due to direct contact with a neighbouring cooling or heating element. Heat packs must not be placed in the polystyrene boxes immediately after activation; they become too hot at first and consume too much oxygen. To be on the safe side, you can stick them in front of a small hole in the outer packaging of the box. Overheating must be avoided, especially in summer.



Terrarium system consisting of two terrariums for one pair of *Phelsuma guimbeui* each | Ralph-M. Budzinski



Couple in terrarium | Ralph-M. Budzinski



Smooth branches or bamboo sticks are important as walking surfaces. | Ralph-M. Budzinski



The terrarium for Mauritius day geckos can be attractively planted with live plants. | Ralph-M. Budzinski

4.3 The Terrarium

Terrariums with a minimum surface area of 40 x 40 cm and a minimum height of 60 cm are sufficient for keeping a pair of *Phelsuma guimbeui* in a species-appropriate way. If possible, however, larger tanks should be used to provide the animals with more room to move around.

Keeping them in pairs is ideal. A male can also be kept with several females. However, the females often do not get along with each other, especially in a constellation of one male with two females. When keeping them in groups in larger terrariums, it is therefore better to keep 3–4 females with one male (NASSE, written communication).

The terrarium is furnished and planted as is usual for day geckos. Bamboo poles of various thicknesses and smooth branches serve as walking surfaces and hiding places for the geckos. Common green plants from the garden centre, such as *Schefflera*, *Anthurium*, *Sansevieria* and *Rhoeo*, are suitable for planting. *Ficus pumila*, various small ferns and mosses can be used to make the area close to the ground more attractive. The large-leaved plants are also used as climbing and walking surfaces by the day geckos and also provide retreats and sleeping areas.

Clay pellets from hydroponics (Lecaton), into which the plants are placed directly, have proven to be a good substrate. This is a low-maintenance solution, as droppings are used as 'hydro fertiliser' and the correct moisture level can be checked at any time using a water level indicator. Alternatively, soil-sand mixtures or unfertilised potting soil can also be used.



4.4 Terrarium technology and climate



Intense full-spectrum light is important for the intensity of the colouring; natural sunlight is best. | Ralph-M. Budzinski

The basic temperatures in the terrarium should be 24-30 °C during the day. At night, the values can drop to room temperature, which may well mean only 16-18 °C in winter.

LED light bars or ceramic spotlights (HQI, HCl, CDM) can be used for lighting. UV radiation is beneficial, but not absolutely necessary if vitamin D is administered orally. A basking area consisting of a spotlight, under which temperatures of up to 42 °C can prevail, should be available to the animals several times a day. The lighting time should be up to 14 hours in summer. In the winter months, it can be gradually reduced to 7-9 hours for a few weeks to ensure a resting phase, especially for the females.

Demineralised water is sprayed once a day. Small amounts of this water, which the geckos lick up on this occasion, do not harm the animals. After spraying, the relative humidity temporarily increases to values of 70-80 %. During the day, it may drop to 40 % in the upper part of the tank.

For drinking, it is advisable to attach a commercially available bird drinker with reservoir to the terrarium pane using a suction holder, which allows the geckos to drink water at any time. Drinking bowls are accepted, but are also often used as a toilet. The water requirement can also be met by daily spraying, but demineralised water should not be used. Depending on the water hardness, you can then expect unsightly limescale stains in the terrarium.



4.5 Outside rearing

Keeping them outdoors in open-air terrariums under natural sunlight for periods of time when the weather is nice has a very positive effect on the geckos' colourfulness, vitality and health. This provides a real regeneration phase, especially for the females, who are otherwise easily exhausted after several clutches.

Gazeterrariums are particularly suitable for such temporary outdoor stays. They are available in suitable sizes from specialist retailers or can be built yourself according to your own ideas. Designs with a solid base and a glass front panel, while all other sides and the lid are made of gauze, have proven to be effective. Fully glass terrariums, even those with large ventilation areas, are unsuitable because they overheat too easily in sunlight.

The outdoor terrariums can be set up in the garden or on the balcony. It is important to ensure that temperatures do not rise too high, so the location must always provide shade and must not heat up too much in hot weather – the temperatures mentioned above for indoor keeping also apply to outdoor keeping. However, the terrariums should not be placed in complete shade, so that the animals can enjoy the sunlight with its natural UV content. Phelsumas are not overly sensitive to cooler or rainy periods.

As long as it is nice and warm during the day, night-time temperatures down to 15 °C are well tolerated. Even a few rainy, cloudy days with daytime temperatures of 15–20 °C are no problem. However, during longer periods of bad weather or if night-time temperatures are too cool, the animals must be brought back indoors.



Facility for keeping Phelsumas outdoors in partial shade during the summer, with well-ventilated terrariums | H.-P. Berghof



Terrarium suitable for outdoor use, with walls and lid made of gauze | H.-P. Berghof

Easily transportable outdoor enclosures are advantageous here, as they can be brought in and out as needed without having to catch and move the phelsumas, which is not only difficult and always associated with an increased risk of escape in the open air, but also causes the animals considerable stress. Ideally, the animals should only be placed in an outdoor terrarium once at the beginning of the season and removed again at the end.

It is also important to ensure that predators such as cats, rats or corvids cannot break into the terrariums. Ants can also pose a threat in large numbers. It goes without saying that the tanks must also be escape-proof.



In nature, the geckos also like to eat plantbased food, such as the tree sap that emerges here | Ralph-M. Budzinski



They like to lick baby food in the terrarium. | Ralph-M. Budzinski



Bird drinkers are used by geckos to drink water. | Ralph-M. Budzinski

4.6 Feeding

The main food is crickets, pygmy cockroaches, wax moths, their caterpillars, larvae of grain mould beetles (buffalo worms) or oven fish. Rarely, mealworms are also offered. Fruit porridge or flower pollen can also be served. In addition, there are special feed mixes for *Phelsuma* available in shops, which are also well suited. Crickets and waxworms are served with tweezers, as the females have an increased nutritional requirement during the reproduction phase, while the males tend to become obese, and this is the only way to ensure adequate food distribution. The males can also become very aggressive towards the females during feeding, so there is a risk that the female will withdraw and not get enough food. Adult animals are fed every other day during the summer months and about twice a week during the winter months. Young animals receive as much food daily as is eaten spontaneously to enable regular growth.

An intensive supply of vitamins and calcium is extremely important for keeping female *Phelsuma guimbeaui* healthy. You can use the vitamin and mineral preparation 'Korvimin ZVT + Reptil' and 'Herpetal Complete T' alternately. For the females, the food animals are always dusted with it, while a weekly rhythm is sufficient for the adult males. However, the calcium supply of the females is insufficient with Korvimin alone. For this reason, small plastic bowls with crushed cuttlefish pulp are permanently placed in all terrariums. Bite-sized pieces are particularly popular. Only when these have already been consumed is the powdery remainder licked up. In contrast to some other *Phelsuma* species, females of *Phelsuma guimbeaui* only consume cuttlebone as needed and generally do not develop permanently oversized endolymph sacs.



4.7 Offspring

On Mauritius, the breeding season is determined by the rhythm of the year. Most clutches are laid there between October and February, i.e. in summer in the southern hemisphere, although individual clutches can also occur throughout the year. You should create a seasonal rhythm for your animals by changing the duration of lighting. The associated lower temperatures mean that the females stop producing clutches and can thus regenerate. This is important for maintaining their health and should definitely be made possible for the animals. In addition, the readiness of males and females to mate is synchronised.

After mating, the female begins to ingest more sepiia lime. Gravidity can be easily recognised by the rounder body shape and the translucent eggs on the ventral side, especially shortly before laying. *Phelsuma guimbeaui* belongs to the egg-laying family. For this reason, suitable egg-laying sites should be offered now at the latest, otherwise the clutch will stick to an inaccessible place or to the glass pane. Horizontally inserted bamboo tubes lined with paper for easy removal of the clutch and with a diameter of ~2.5 cm are readily accepted by us as egg-laying hiding places.



Mating of *Phelsuma guimbeaui* | Ralph-M. Budzinski

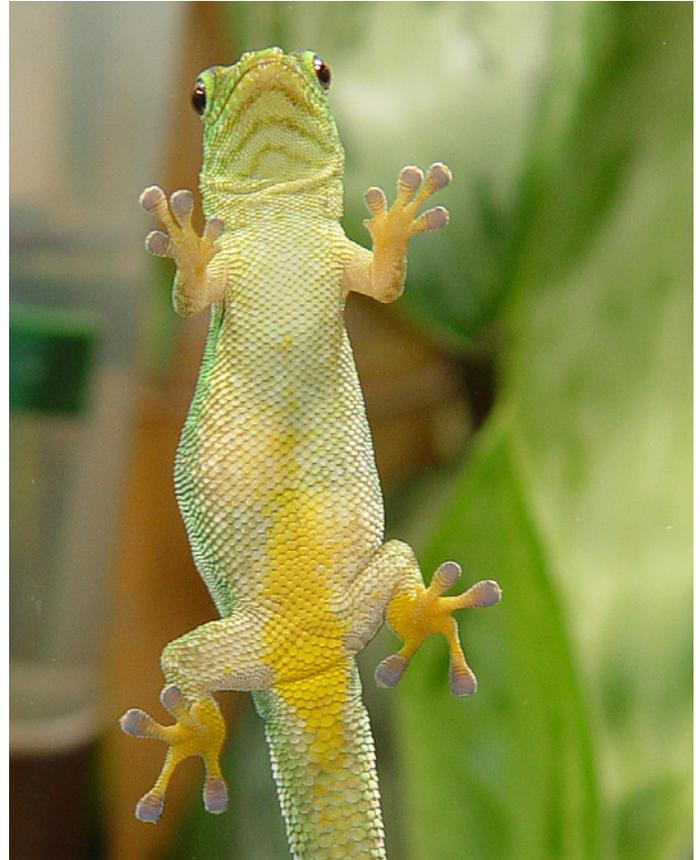


Once the eggs have been laid, you should wait about two days before removing the paper for incubation, as the female will occasionally check on the clutch during this time. If it has already been removed, it may avoid this tube when laying further eggs. As the adult geckos chase after the hatchlings, clutches that cannot be removed should be secured with a cover and the young animals transferred to a rearing container immediately after hatching. If animals do hatch in the terrarium, the hatchlings should be removed as quickly as possible, as the adults will see them as a welcome change to their diet.

The sex of hatchlings in day geckos of the genus *Phelsuma* is influenced by the incubation temperature. At constant incubation temperatures (e.g. at a constant 22 °C, constant 24 °C or constant 28 °C), predominantly to exclusively (90–100 %) females hatch (BUDZINSKI, written communication).

In order to achieve the most balanced gender ratio possible among the young animals, the following incubation conditions have proven successful: During the day, the temperatures in the incubator remain at 30.5 °C (plus/minus 1 degree) for six hours. For the remaining 18 hours of the day, the incubation temperature is set to 23 °C (plus/minus 1 degree). The gender ratio at hatching is then approximately 50/50.

Alternatively, incubation in a terrarium can also be successful, and if the terrarium climate offers suitable temperature conditions, young animals of both sexes will hatch there too (NASSE, written communication). Naturally, this is harder to control.



The female's pregnancy can be easily recognised by the translucent eggs. | Ralph-M. Budzinski



Double clutch of eggs glued to the glass pane. The plastic box attached to the glass serves to protect the eggs and makes it easier to remove the hatchlings from the terrarium later. | Ralph-M. Budzinski



4.8 Rearing the young

The newly hatched young, which have a total length of 3.5-4 cm, initially move into 1-litre plastic storage boxes with sufficiently large gauze ventilation areas in the lid and on one side. Alternatively, they can also be transferred straight into the breeding terrariums described below; different carers have different opinions on which method works best. The furniture only consists of two diagonally inserted bamboo sticks or small twigs and a bird bath with reservoir. No substrate is used, as the young geckos could ingest substrate such as soil or sand during their feeding attempts. The young geckos are given vitaminised food animals every day for the first few months of their lives. However, only as many as they eat in a row. Uneaten food animals running around in the tin tend to cause stress for the young *Phelsuma*. The smallest developmental stages of crickets, oven fish or cereal mould beetles (buffalo worms) are suitable as food. Occasionally the young animals are also given small amounts of fruit pulp or Day Gecko Food (e.g. ZooMed).

At the age of 6-8 weeks, you should move the little *Phelsuma guimbeau* to rearing terrariums measuring 30 x 30 x 50 cm (L x W x H) or preferably to outdoor aviaries, depending on the time of year. These outdoor aviaries are made of black plastic gauze (insect screen for windows) with a zip on the side for access. They are cone-shaped with a base diameter of 30 cm and a height of 30 cm. The most important furnishing item is a plastic plant, which provides the animals with hiding places and shade. A bamboo stick attached to the floor is also popular as a place to run and sunbathe. To provide drinking water, we place a plastic bowl with household paper kept constantly wet inside.



Freshly hatched young gecko
| Ralph-M. Budzinski



Young animal changing colour
| Ralph-M. Budzinski



Offspring in different colouring stages
| Ralph-M. Budzinski



4.9 Problems

The sex ratio among hatchlings is often very unfavourable because few or no males hatch. This is due to the incubation temperatures – please refer to the information in Chapter 4.7!

Lighting is very important for the colour expression of *Phelsuma guimbeaui*. The red markings in particular only appear as pale brown spots if the lighting is inadequate. Under very intense terrarium lighting, such as that achieved with metal halide lamps with UV content, HQI or HCI/CDM lamps, the markings take on an orange-red colour. The red colouration develops best when kept outdoors. The exact cause of the influence of light on the colouring has not yet been investigated. A connection with UV radiation would be obvious. However, the more intense red colouration under HQI light cannot be explained by this, as all UV radiation is filtered out by the protective glass of the lamp and the cover glass of the terrarium. The high light intensity, combined with the heat radiation, and the natural spectral distribution remain as an explanation. However, as colour development is much faster in the open air and also leads to better results, the interaction of different factors may be the decisive factor.

Although it is easy to distinguish the sexes of adult *Phelsuma guimbeaui*, some experience is required to determine the sex of juveniles. Males can be recognised by their preanofemoral pores at around three to four months of age. Unfortunately, some young females also show supposed pores. However, these are usually limited to the preanal area and disappear with increasing age. In clear young males, the pores extend to the thighs and also become significantly larger. Young males grow faster on average and, above all, gain mass more quickly. However, this is not a reliable characteristic for distinguishing between the sexes, as the variation is too great.



Geckos in terrariums easily lose their splendid colouring if they do not receive as much high-quality lighting or sunlight as possible. | Ralph-M. Budzinski



The geckos are real foodies - but beware of obesity! | Ole Dost

Compared to other *Phelsuma* species, *Phelsuma guimbeaui* grow much more slowly. Although they are often sexually mature at the age of one year, which can be recognised by the formation of the first eggs in females, females in particular should not be used for breeding until they are one and a half, or better still two years old. The larger and stronger the animals are, the better they can cope with the demands of egg production and the stress of the constantly mating male.

Unfortunately, the females can occasionally be poor eaters. This must be taken into account, especially during the reproduction period, by ensuring that each female is adequately fed. This can be achieved very well with 'Petit Filous', which are almost always accepted by the animals and can also be given individually by letting the animals in question lick the mash off a wooden stick or spoon handle. The advantage of 'Petit Filous' over pure fruit pulp is that they contain fat and thus support the absorption of fat-soluble vitamin D. Females of *Phelsuma guimbeaui* easily develop rachitic diseases or even egg loss if they are not supplied with sufficient vitamins and calcium. Nevertheless, mash feeding should only be used selectively, as too frequent administration of such energy-dense food very easily leads to obesity, especially in males.

In principle, females may be incapacitated due to the high stress caused by laying eggs. Temporary separation of the sexes and/or outdoor access have a positive effect.



5. Further Reading

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