Parson's Chameleons (*Calumma parsonii parsonii*) – Madagascar's Gentle Giants

The Parson's Chameleon, with a length of up to 70 cm one of the largest chameleons in the world, is rightly considered the "gentle giant" of Madagascar. This is partly due to the sheer size and mass of the animals - over 500 g are not uncommon for adult Parson's Chameleons - but also to their usually very sociable and calm character. A few decades ago, these animals were considered "unkeepable" , but today they are popular pets in captivity and are regularly bred in reasonable numbers.

Text and photos by Alexandra Laube, Andreas Augustin & Thorsten Negro

Calumma parsonii parsonii „orange eye" nearby Mahambo

Parson's Chameleons were described as early as 1824 by the French zoologist and palaeontologist Georges Léopold Chrétien Frédéric Dagobert Baron Cuvier. He had never seen a living *Calumma parsonii parsonii*, but had worked on bones in the collection of the University of Paris. He dedicated the species to the Irish physicist and antiquarian James Parsons, who had already mentioned the chameleon in the 18th century under the name *Chameleonis rarissima* in one of his writings (PARSONS 1768). Actually, the species should have been called *Calumma parsonsi*. However, the "s" was lost over the years.

Habitat in Madagascar

Madagascar is located in the Indian Ocean, about 400 km east of the African mainland. It is the fourth largest island in the world: its area of 587,041 km² is slightly less than Germany and the whole of Great Britain put together. Madagascar is extremely rich in endemic reptiles and especially chameleons. However, according to the World Bank, the population lives in what is currently the poorest country in the world: over 75% of Madagascans live on less than $ 2 a day. This ensures that species conservation is not very high on the list of priorities in many places. Slash-and-burn agriculture for rice paddies, logging and the trade in precious woods like rosewood continue to decimate the island's existing forests every year. Parson's Chameleons are as

Parson's Chameleon „orange eye" in its habitat in Akanin'ny Nofy

threatened by habitat loss as many other chameleon species in Madagascar. *Calumma parsonii parsonii* divides into four colour varieties on Madagascar, inhabiting different habitats on the large island.
The „orange eye" colour variety is found along the east coast from about 50 km south of Toamasina (Tamatave) via Soanierana Ivongo to Mananara at Antongil Bay (GLAW et al. 2007). The males here have a very brightly coloured, sometimes almost white head, with orange eyelids and light green to light blue body. They are found in narrow gallery forests only a few hundred metres from the Indian Ocean, but also in coffee plantations and rainforest remnants up to 50 km inland, for example in Anjahambe. 30 years ago, it was still assumed that the Parson's Chameleon was a pure rainforest inhabitant (SCHMIDT 1993). Today, we can clearly refute this assumption, because we find animals outside rainforests in secondary vegetation and cultivated plantations every year. Thick branches with mosses and lichens on relatively low trees are preferred habitats. That the chameleons are so often found in plantations could also be due to the fact that the trees there are pruned to a height suitable for harvesting and the chameleons are thus easier to find. They simply cannot disappear there to 15 m and more as they do in the primary rainforest. On the offshore island of Nosy Boraha (St. Marie) with its white dream beaches, Parson's Chameleons also occur in a small remnant of rainforest. The habitats of the „orange eyes" lie between 0 and a maximum of 500 m a.s.l., so that this colour variety lives in a much warmer climate than the other colour varieties of the Parson's Chameleons. Here, even panther chameleons occur in the same habitat. The Malagasy call the Parson's Chameleon on the east

„Yellow giant" juvenile in Vohimana

„Yellow giant" in Vohimana

„Yellow lip“ male nearby Ranomafana

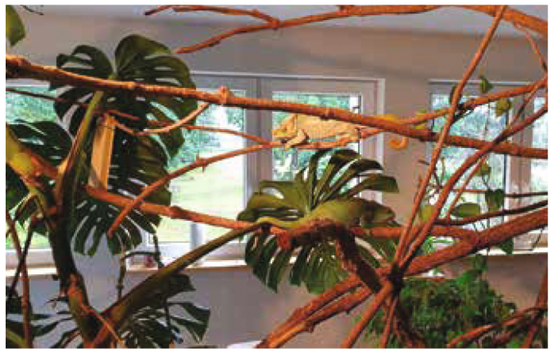
coast "tarondro" (pronounced tah-ronjoo), while all smaller chameleons go by the common name "tanalahy" (pronounced tanala).
The „yellow lip“ colour variety occurs in and around Ranomafana National Park in the southern highlands of Madagascar, about 420 km southeast of the capital Antananarivo (GLAW et al. 2007). The local males are turquoise blue in colour and have clearly defined yellow lips and yellow rostral appendages. Ranomafana is situated in an elongated valley at about 1000 m a.s.l.. The national park itself consists of primary rainforest, while the areas further southeast to Ifanadiana consist mainly of banana plantations, cleared slopes and secondary vegetation, and are somewhat lower at up to 460 m a.s.l.. Only a few fragments of the original rainforest remain outside the national park, near which *Calumma parsonii parsonii* prefers to stay. The colour variety is difficult to find in the national park itself. You usually have to travel a little further out of the valley towards Ifanadia to see these chameleons. The habitat overlaps with that of *Furcifer balteatus*. During the dry season - which is not really dry in the rainforest - it gets up to 15°C cold here at night.
A third colour variety also comes from the highlands, but from the eastern foothills (GLAW et al. 2007). The Vohimana Reserve and its surroundings are home to the „yellow giants“, so named because the males of the colour variant are more or less yellow. Vohimana is located barely 15 km from the Andasibe-Mantadia National Park, only about 160 km and thus four hours by car via the RN2 from the capital Antananarivo. Vohimana lies at an altitude of around 900 m, so it is correspondingly cool at night. In the surrounding area, „yellow giants“ can be found up to 550 m above sea level. Another locality for this colour variety in the eastern highlands of Madagascar is Anosibe an'Ala, a place about 80 km south of Moramanga, at about 800 m above sea level.
The fourth variety of Parson's Chameleon is the „green giant“ from Masoala National Park at Antongil Bay (GLAW et al. 2007). Masoala itself consists mainly of primary forest and is best reached by boat. The immediate surroundings of Maroantsetra have long since given way to lush secondary vegetation. *Calumma parsonii parsonii*, however, can be found not only in Masoala, but in various places around Antongil Bay. Only a few photos exist of this colour variety.
For a long time it was thought that chameleons were pure sit-and-wait predators. However, they do not actually just sit around and wait for prey, but move very slowly through the branches, pausing again and again and then moving on leisurely. Therefore, some years ago it was proposed to call this form of foraging a „cruise forager“ (BUTLER 2005). Parson's Chameleons in Madagascar are an excellent example of this. They move small distances through the trees every day, but are overall rather site-faithful. Even after a year, they can often be found within less than 150 m of each other. They feed on almost anything they can get - especially insects such as grasshoppers, beetles and butterflies. Occasionally, a small bird or day gecko may make it onto the menu (ABATE 1998, RISLEY 1998). Anecdotally, Parsons chameleons even accept gecko eggs and mice as food (SCHMIDT 1993). Contrary to myths that Parson's Chameleons feed largely on birds, we have observed on several occasions on the island that although they will shoot at almost anything, they will often spit out prey that is too large. In Germany, large Parson's Chameleons of the „yellow lip“ colour variety kept in the garden also like to shoot at small birds or passing mice.

Terrariums for Parson's Chameleons must be spacious and have large ventilation areas

Keeping in captivity

At present, *Calumma parsonii parsonii* of the „orange eye“ colour variety are the most commonly bred in captivity. This colour variant is now widespread in herpetoculture in many countries. The first Parson's came to Germany in the early 1990s, the species arrived in the USA a few years later (TRÖGER 1996, ABATE 1997, ABATE 1998). Germany and the USA are still the countries with the highest numbers of offspring. „Orange eyes“ were the first Parson's Chameleons to be successfully bred in Germany (PIETSCHMANN 1997). Since the 2010s, breeding of „yellow lips“ in Germany has been promising, but it is not yet possible to speak of a widespread distribution of this colour variety. The synchronisation of wild „yellow lips“ with the local seasons (the warm rainy season in Madagascar is in the cold German winter, i.e. exactly opposite) seems to be more difficult than with „orange eyes“ (TRÖGER 1996). Isolated „yellow giants“ are bred here and there.
Parson's Chameleons are best housed in terrariums with very generous ventilation areas. These can be homemade with a lid, door and side made of gauze, but also purchased screen cages. Both sexes are kept individually. Lighting is provided by „Reptiles Expert“ metal halide lamps, „Arcadia“ UV-B tubes and older

An "orange eye" male kept in a winter garden



A „yelllow lip“ male in a winter garden

Outdoor encosures in summer

Mating in Parson‘s Chameleons

metal halide lamps. The lighting time is 10 to 12 hours in summer and winter. In Madagascar, the day length is around eleven hours, with a maximum of two hours variation throughout the year. However, the much greater difference in day length between summer and winter in Germany does not bother the chameleons. In summer, for example, when the sun sets much later than 6 pm in Germany, the chameleons nevertheless go to their sleeping places earlier.

When keeping this species, it is important to know the habitats of the respective colour variety: „Yellow lips“ and „yellow giants“ come from the highlands and thus tolerate a much cooler winter brumation and less high temperatures in summer than „orange eyes“, which occur on the east coast in much warmer habitats. We highly recommend outdoor keeping in summer if temperatures are above 15°C at night and no higher than 30°C during the day. The cages are showered with lukewarm water several times a day, both indoors and outdoors. When setting up cages for Parson‘s Chameleons, it should be noted that the animals quickly damage small and delicate plants due to their size and weight. Larger trees and robust climbing plants, on the other hand, work well. The branches should be thick enough so that the chameleon can grasp two-thirds of them. Parson‘s Chameleons prefer horizontal paths in the terrarium. The branches should not be too dense - this is where the species differs greatly from smaller chameleons - they won‘t use too densely equipped cages. The planting, on the other hand, should be lush. Parson‘s Chameleons especially like to sleep on branches that are protected from view by large leaves.

Clutches from different years, eggs incubated for one year on the left, freshly laid eggs on the right

Several issues are enormously important when keeping Parson‘s Chameleons. One is their enormous need to drink (TRÖGER 1996, AUGUSTIN 2021). Although Parson‘s Chameleons drink from leaves like all chameleons, they should also be watered daily by hand with a slowly dripping spray lancet or pipette. Drinking can already be practised with young animals. Drippers are not as well accepted as patiently practising watering by hand. In our experience, daily watering leads to a longer life expectancy and far fewer problems with gout and renal failure. There is probably also a connection between these diseases and overfeeding, as most keepers massively overestimate the actual energy requirements of chameleons. Economical feeding - one adult food animal per chameleon per day or two smaller food animals - is recommended. The range of food animals can be wide, winged insects, grasshoppers and caterpillars are particularly popular. Another factor for a longer life expectancy in Parson‘s Chameleons is the observance of a cool winter brumation, which imitates the dry season on Madagascar. During this time, Parson‘s Chameleons hardly move for weeks and stop eating.

A health problem in Parson‘s Chameleons is pododermatitis, which occurs from time to time, especially in adult, heavy animals. The skin on the hands and feet is relatively sensitive to constant

The picture series shows the hatching of a Parson's Chameleon

moisture and small injuries, such as those that occur after climbing sharp grid or branch edges. It is therefore important to ensure that the cage dries out at night and that the Parson‘s Chameleon sits in a dry and soft place. Soft branches such as elderberry have proven to be practical and low-risk for injuries. In outdoor enclosures with bars, we advise to check hands and feet daily.

Keeping Parson‘s Chameleons in captivity is a lot of fun if you are well prepared. The individual Parson‘s develop very individual traits and personalities. However, they are often "little divas" - sometimes the water temperature is not right when spraying, sometimes someone can't eat while moulting, sometimes you are "shot at" before you even open the food box because they are so greedy for food. And of course everything goes a bit slower than with other chameleons - hectic is alien to a Parson‘s Chameleon. The care is time-consuming and certainly more so than with other chameleon species, but it is also a very nice hobby that gives a lot back and we wouldn't want to miss it.

Mating and egg laying

In Germany, mating usually takes place in midsummer, i.e. from July until August. It has proven successful to place the female with the male and not vice versa. The male shows that he is interested in the female with wide nodding movements of his head. However, it can take some time for Parson‘s to actually mate. As with everything, these chameleons are rather slow. We may leave them together for a few days if the female accepts him and the male is interested. Usually there are several matings on several days in a row. If the female immediately wiggles back and forth on her branch and shows a dark speckled colouration, the two partners are immediately separated.

The females are gravid for four to six months. Between the end of December and the beginning of February, the female digs an elongated tube into the soil and lays 20 to 69 eggs inside (LAUBE et al. 2020). A single spot in the cage with deep sand is suitable as a deposition site, as this is much easier to wash off the eggs than soil. To "show the female the way", it is a good idea to let a thick branch run exactly to the suggested deposition site. Parson‘s females prefer to lay their eggs under a privacy barrier, so we cover cages of ready-to-lay females with towels.

Incubation of the eggs

Once the female has completely closed her nest again, the eggs can be carefully dug up, cleaned and transferred to the incubator. Parson's chameleons are capable of sperm retention (LAUBE et al. 2020). If no mating has taken place in a year, there may still be fertilised eggs in the clutch. However, sperm retention

Nursery cages for juvenile Parson‘s Chameleons

View into a nursery cage; the hatching juvenile has been placed inside a cricket box in the cage

Freshly hatched!

naturally only works for a limited time - from the second or third clutch onwards, the number of fertilised eggs decreases sharply and deformed, sometimes very small juveniles appear more frequently. Therefore, a new mating for fertilisation of the eggs is always preferable.
For years, the incubation of the eggs was the big problem in keeping Parson's Chameleons (SCHMIDT 1993, TRÖGER 1996, ABATE 1997). Today, fortunately, the riddle of incubation has been successfully solved. We use slightly moist perlite as substrate for incubation. The eggs are sprinkled with distilled water once a week - earlier attempts without this "manual rain" resulted in very thick-shelled eggs and hatching problems (AUGUSTIN 2011). Incubation is carried out at 23 to 24°C, imitating a diapause without further water supply each February at low temperatures of 13 to 14°C for three to six weeks (AUGUSTIN 2011). In total, the eggs go through two diapauses before hatching after one and a half years (15-24 months). This time is considered the longest incubation period among chameleons and has long been questioned because no other chameleon requires such a long incubation of eggs (ABATE 1997). During the long incubation, the eggs grow enormously. If the substrate is too moist, they can even burst (AUGUSTIN 2011).
Incubating eggs inside the female's cage was tried in the past, but usually does not work (TRÖGER 1996). Due to the length of incubation, problems with bacterial and fungal colonisation of the eggshell were still frequent at the beginning of Parson's breeding. Today, such eggs can be checked with an egg monitor to see if there is still life in them (LAUBE et al. 2020). If there is still vitality, it has proven useful to sprinkle the eggs with a 3% hydrogen peroxide solution (AUGUSTIN 2011).

Hatching

From May onwards, the time has come: hatching is imminent! If the last diapause is carried out in December instead of February, the first hatchlings may even appear in April. The hatching of Parson's Chameleons is announced by visibly "sweating" eggs. In the following 48 hours, the juvenile slits the egg several times with its egg tooth on one pole and then sticks out its head. We transfer eggs that have already been slit into a cricket box with damp kitchen paper. It can take up to two days until the Parson's juvenile climbs completely out of the egg. Placing the open box in the nursery cage often leads to faster emergence from the egg, presumably due to the incidence of light.
Parson's clutches, unlike many other chameleon species, do not all hatch on the same day. Often the young take weeks to hatch and chameleons hatch from early June until late August. There seems to be no such enormous hatching synchronisation as known from panther or carpet chameleons. Even if Parson's juveniles remain in the box with unhatched eggs and climb diligently over the other eggs, this does not lead to increased hatching success.
With the incubation method described, the young animals usually hatch without any problems. Nevertheless, the hatching should be well observed. Individual juveniles slit their egg clumsily; sometimes there are still shells that are too thick and very rich in calcium. In such cases, careful hatching assistance can be useful. In most cases it is enough to widen the already existing slits, place the hatchling's nose a little towards the opening and pat it dry. Rarely, it is necessary to open an egg pole completely with scissors. Even then, however, we leave the hatchling in a cricket box with moistened kitchen paper until it leaves the egg on its own.

Raising the juveniles

In Parson's Chameleons, separate rearing of the juveniles has proven successful (AUGUSTIN 2021). Already on the day of hatching, the young animals are very aggressive towards each other and can hardly be socialised with each other. Therefore, we raise each Parson's juvenile strictly individually. Each juvenile moves into a 30x30x30 or 30x30x40 cm nursery cage, which consists mainly of gauze. The first feedings consist of fruit flies (*Drosophila hydei*), after a short time you can switch to micro crickets (*Acheta domesticus*). With increasing age, the food supply expands to terflys, goldflies, small grasshoppers, soldier flies, stick insects and rarely waxworms. In contrast to other chameleon species, the juveniles are rather shy - in the first weeks you can only see a juvenile shooting food with patience, later a little more often. For supplementation we use „Korvimin ZVT+R“ and „Herpetal Mineral“. Andreas uses 20W halogen lamps and the well-tried Osram Vitalux 300 W as UV-B lighting once a week. Thorsten and Alex have switched to permanent UV-B lighting for the young animals with Arcadia

A few weeks old juvenile

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One-year-old offspring of *Calumma parsonii parsonii*

D3 Forest 6% 39W tubes for some time now. Both variants work without any problems. The cages of the Parson's juveniles are sprayed with lukewarm water several times a day. During the night, the cages can dry out. Andreas has equipped his nursery cages with a gauze floor from which he can vacuum off fallen droppings and rubbish every week. Alex and Thorsten use kitchen paper as a substrate, which is completely changed once or twice a week.

The sex of the young chameleons can only be determined with certainty at an age of 9 to 12 months, when the Parson's Chameleons change to their adult colouration (AUGUSTIN 2011). With a little practice, the juveniles can be assessed by their colouration, rostral appendages and behaviour when they are handed over to new owners at the age of three to four months. However, they can only be surely sexed at the mentioned later point in time.

Sexual maturity and age

Parson's are among the chameleons with the highest life expectancy. In 2017, bone preparations proved that *Calumma parsonii* in Madagascar can live at least nine years (TESSA et al. 2017). One of Andreas' breeding males, Winfried, is now 21 years old - he was bred in Austria in 2001 and came to Germany in 2003. Females usually live to a lesser age, presumably due to reproduction, but can certainly reach 10 years.

However, the high life expectancy also has the "disadvantage" that Parson's Chameleons become sexually mature relatively late. The first successful mating does not take place until they are two to three years old. So if you want to breed Parson's Chameleons, you need one thing above all: a lot of patience. Apart from the more complex care, this may be another reason why there are only a handful of long-term breeders in Germany.

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