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Captive breeding of the Sandfish *Scincus scincus* (LINNAEUS, 1758)

Authors

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With illustrations by the authors

Abstract

First successful captive breeding of *Scincus scincus* with data on mating, gravidity, egg deposition, incubation, and hatching. Husbandry conditions of the parental specimens are described in detail.

Key words: Reptilia: Sauria: Scincidae: *Scincus scincus* (LINNAEUS, 1758), reproduction.

Care of the parent animals

The biology of the Sandfish has already been reported in detail elsewhere (HARTMANN 1989a-b). In this section, therefore, only the care of the parent animals will be discussed. Both animals come from Douz in Tunisia. According to HARTMANN (1989a), they belong to the subspecies *Scincus scincus cucullatus*. The parents have been living in a 60 x 30 x 30 cm (L x W x H) terrarium since May 1994. The substrate consists of an 8 cm high layer of Rhine sand, from which the largest grains of sand were sieved out with a medium-sized kitchen sieve. In the terrarium there are two limestone bulbs for decoration, which rest on the glass floor of the terrarium. The skinks get water more or less regularly from a small water vessel. About 21 cm above the bottom of the ground is a spotlight of 75 watts during the warmer season and 150 W during the colder season. The terrarium, which is open at the top, is located directly next to a south-facing window and thus receives a lot of daylight. When the sun is shining, it is flooded with sunlight for several hours, sometimes very intensely, depending on the season and the position of the sun. However, since it is behind a window pane, it does not receive UV radiation. There is also no other UV radiation source. Next to the terrarium there are a few plants that shade some ground areas, so that the skinks can still seek cooler places, especially during hot summer days. Locally, about 50°C is occasionally reached. The skinks visit this place for a very short time to warm up. Before they finally leave it in a hurry, they lift all four extremities, some of the extremities, to reduce their physical contact with the hot sandy bottom, sometimes even her tail up. They thus occupy a position that is called a "seesaw" in the gymnastics sector. Otherwise, depending on the season, there is a temperature structure of 30 to 18°C during the day on the sand surface. At night, the temperature drops to values of up to 15°C. In one corner of the terrarium is a plastic container measuring 18 x 18 x 18 cm (L x W x H), which contains the same substrate as the terrarium. It stands on the glass bottom, so that its upper edge corresponds to the level of the other sandy bottom. The plastic container is covered with a lid. The skinks can enter the container from above through a 10 x 3.5 cm hatch. The sand filling in it is always kept moist. The skinks like to seek out this moisture zone to dig in it. It obviously enables them to shed their skin optimally, as most of the stripped skin shreds in this vessel. Since the skinks sometimes spend a long time and especially the nights burrowed in the slightly damp sand, they certainly absorb moisture through the skin. During the breeding season, the plastic container serves as an egg-laying facility. The movement of the skinks in the Rhine sand is certainly not as optimal as in the finest desert sand: However, the slower speed

of "diving" into the substrate does not seem to bother them. After more than three years of care on Rhine sand, they are in the best condition, so that desert sand does not seem to be absolutely necessary as a substrate for the care of *Scincus scincus*. When he arrived, the well-fed male was only moderately active. It absorbed little nourishment and often lay on the surface of the sand with its eyes closed. After other of our lizards (*Cordylus*) had shown similar behavior when parasitized by intestinal nematodes, the *Scincus* male was given Molevac® (1 ml /kg body weight) and later Panacur0 (40 mg active ingredient Fenbendazole KGW), each were administered once. As a result, his condition improved very quickly, which was reflected in steadily increasing activity and regular food intake. The skinks are mainly fed on flour beetle larvae and pupae, occasionally also on beetles and crickets, which are always vitaminized with Corvimin ZVT®. Especially the former food animals are very well accepted and digested very well. So far, the skinks have not been given any plant-based food. They lick up water from a small bowl. The skinks are very agile when it comes to food intake and often also very envious of food, which manifests itself in occasional bites. If the skinks have eaten enough food, they indicate this by simply disappearing into the sand. On the other hand, slight vibrations or knocking on the terrarium window during the activity phase will cause them to emerge from the sand quite quickly, if they are hungry. For the first two years, the skinks were overwintered from the beginning of December to mid/end of February in a cool room lit by daylight at 12°C. A few weeks earlier, they were no longer fed in preparation for the winter rest, and the heating and lighting were steadily reduced over a period of two weeks. The skinks then remained buried in the dry sand until the following spring. In the winter of 1996/97, the terrarium was left at its window location. Only the spotlight was switched off for about two weeks. The terrarium received some warmth from the space heating installed under the windowsill, which was active during the day. The skinks were not visible for a period of about 1 month. In addition to the reproductive activities, in the skinks described here, the male can be distinguished from the female by a spur-like scale, which is present on the left and right of the cloaca in the former. Since there are no comparative specimens, global information on sex determination according to the before mentioned characteristics cannot be provided here.

Copulation and egg-laying

After the skinks had mated several times in the spring of 1995, the first egg-laying took place on 29 July 1995. An increased digging activity of the female a few days earlier announced the imminent egg-laying. The two eggs were recovered and transferred to a plastic container with Perlite (Perlite : water = 1.5:1). The heating element for the incubator was found to be too weak, so that the temperatures, which reached about 28°C during the day, dropped to 24°C at night. On 20. August 1995 one of the eggs showed very heavily fungus. It contained a dead embryo in which the eyes were clearly visible. Despite the constant moisture of the brood substrate, the other egg had sunk extremely strongly on August 22, 1995 and had a somewhat reddish color. Since its condition was not expected to develop further, it was finally opened on 7 September 1995. It contained a living embryo whose extremities had already developed, but which was still at a very early stage of development. Due to the opening of the egg the embryo did not survive.

After the hibernation in 1995/1996, there were again several matings. Before copulations could be observed on 20 and 27 June 1996, there were first signs of reproduction activity after the female showed clear bite marks on both sides of the neck on 19 June 1996. From 3 July 1996 onwards, it began to carry out occasional excavation activities and from then on it no longer took on food. From 8 July 1996, the female was almost only in the egg-laying container and rummaged mainly to its bottom. On 13 July 1996, a clearly yellow-colored, glassy and therefore unfertilized egg was found on the substrate of the container.

Bite marks on the neck of the female and thus the indication of reproductive activities became apparent in 1997 from 24 May. Mating attempts could be seen on June 11. On 17, 23 and 27 June 1997, copulations were observed. They lasted 2, 3 and 2 1/2 minutes respectively. From July 7, 1997, the female stopped feeding. After that, it began to dig intensively in the storage container. The eggs were laid on 13 July 1997. Two eggs were recovered from the damp sand in the storage container the following day. They were white in color and each showed a small transparent spot on their upwardly oriented side, which turned somewhat reddish from 16 July and clearly proved to be a germinal disc from 17 July. One of the eggs had a very slight dent when it was recovered, which disappeared after a day after being transferred to the incubation substrate. Both eggs weighed 2.4 g each.

Incubation

The eggs were incubated in a plastic container filled with Perlite. The ratio of Perlite to water was 1.5:1 (by weight) in the first weeks of incubation, and later 2:1. The eggs were embedded in the Perlite in such a way that they were covered with a substrate layer of about 1 cm. They were checked daily by lifting the lid of the substrate container and briefly sweeping them free. As a result, the container was ventilated. Water droplets on the walls of the substrate tank showed that sufficient moisture was ensured without the substrate itself appearing too moist. From time to time, the container was weighed and the amount of water evaporated, especially due to daily opening, was replenished as needed. Breeding temperatures ranged from 27.8°C at night to 31.0°C during the day, with an average of 29.5°C. As a precaution, no further data (measuring, weighing, etc.) on the eggs were obtained.

Hatching and rearing

After 64 days of incubation, an egg from a young animal was opened independently on 14 September 1997. After being discovered at 8:27 p.m., it must have opened the egg between 8:00 p.m. and the time of discovery, even after the frequent checks carried out on that Sunday. The very light and pale pink juvenile had freed about half of its front body from the egg and had penetrated to the surface of the substrate. Since it appeared to be very sensitive, it was not photographed. The surrounding Perlite was carefully removed. The next day, the cub had freed itself from the egg (after a check at 5:30 p.m.) to 2/3. However, there were still remnants of the yolk sac, which is why it was transferred to another container and placed on damp paper cloths. The other egg had collapsed strongly at this time. It contained an embryo that had been developed to the point of hatching maturity, but had already died. In this case, the yolk sac was still very large. On September 16, the cub, which had now completely hatched from the egg, had become much fuller; it had completely absorbed the yolk. After remnants of the umbilical cord were still present, it was kept on damp cloths for another day and transferred to dry paper towels a day later. The young Sandfish then became increasingly active. The first shedding of skin, in which the remains of the umbilical cord were also stripped off, took place on September 19. Since the cub was housed dry, some of the very thin stripped skin stuck to the body and to the extremities. These residues were softened by means of a moistened brush and stripped off. The weight of the young, 7 cm (GL) tall Sandfish, which moved into a small terrarium equipped with dune sand from 22 September, was 2.1 g on that day. The first food intake took place on September 25 in the form of small crickets. For some time now, small wax moth caterpillars and the smallest flour beetle larvae have also been accepted, whereby all food animals are always dusted with Korvimin ZVT®.

Summary

The first successful breeding of the Sandfish *Scincus scincus* in the terrarium is reported. In July 1997, two eggs were laid and incubated in Perlite. The ratio of Perlite to water was 1.5:1 (by weight) during

the first few weeks, later 2:1. The eggs were incubated at temperatures of 27.8 to 31.0°C, with an average of 29.5°C. 64 days after laying eggs, a young hatched.

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Summary

Captive Breeding of the Sandfish, *Scincus scincus* (LINNAEUS, 1758)

Terrarium:

1 pair adults from Douz (Tunisia); 60 x 30 x 30 cm; 8 cm layer fine sand from which larger grains have been removed; small water dish; 75 W Spot-light 21 cm above sand (warm season), 150 W (cooler season); terrarium placed at south-facing window; no lid; periodically intensely flooded by sunlight; no UV -light; adjacent planes create shaded spots; occasionally localized spots with 50°C, frequented for very short periods of time by the skinks; plastic container of 18 x 18 x 18 cm submerged into sand up to ground level; filled with same sand, but kept moist; lid with entrance 10 x 3,5 cm; often frequented by the skinks; results in perfect molts; also serves for egg-laying; sand is not as fine as original desert sand, slows down "diving", but appears to be acceptable.

Health:

Male little active on receipt; reluctant feeder; often lying on surface with eyes closed; infection with intestinal nematodes suspected; treated with Molevac® (1 ml/kg bodyweight) and subsequently with Panacur® (40 mg of the agent Fenbendazol/kg BW); rapid recovery and increased appetite.

Diet:

Mainly mealworms and their pupae, occasionally crickets; always fortified with multivitamin powder; mealworms are favorite food and digested well; no vegetarian supplements; water is licked from small dish; highly food-envious, bitings occur recurrently; very agile hunters.

Thermal regime:

Surface temp. sand 18-30°C (day), 15°C (night); initial hibernation at 12°C from early Dec. to mid/late Feb. in a bright room; in winter 1996/ 97 left at their site at window, only spotlight switched off; disappeared for 6 weeks.

Mating/egg deposition:

Several matings in spring 95; 2 eggs laid in box on 29.7.95; placed in moist perlite (1,5:1 p:w); temp. 28°C (day), 24°C (night); 1 egg spoiled by fungi on 20.8.; contained dead embryo; other egg found caved in and reddish color on 22.8.; opened on 7.9., contained live embryo at early stage; after hibernation in 1995/96 several matings (observed on 20. & 27.6); 9 began digging on 3.7.; retreated fully into laying-box on 8.7.; yellow egg found on 13.7.; in 1997 mating-related activities noted from

24.5.; attempted mating witnessed on 11.6.; actual matings observed on 17., 23., 27.6.; 2-3 minutes; 9 ceased to feed on 7.7.; eggs laid on 13.7.; 2.4 g; placed 1 cm deep in watered Perlite (1 ,5:1 for initial few weeks, then 2:1); checked (and rhus ventilated) daily; temperature range 27.8°C (night) to 31,0°C (day), average 29,5°C; 1 hatched on 14.9.97 between 20:00 and 20:27 h (64 d); rook until 16.9. to leave egg; kept on moist paper; other egg collapsed, contained fully developed dead embryo with large yolk sac; first shedding on 19.9.; measured/weighed on 22.9. - 7 cm, 2.1 g- and relocated to small terrarium with fine dune sand; Started feeding on small crickets on 25.9.; takes now also small waxworms and tiny mealworms; all food dusted with multivitamins.

Writings

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Fig. 1: *Scincus scincus cucullatus*, male (left) and female

Fig. 2 & 3: *Scincus scincus cucullatus*, male (top) and female

Fig. 4 & 5: The male *Scincus scincus cucullatus* (left) possesses a spur-like scale on either side of the cloaca. This modified scale is absent in the female (right)

Fig. 6: *Scincus scincus cucullatus* egg with scale (1995)

Fig. 7: Hatchling which was found dead in the egg (1997). It had been stored frozen for a short time.

Fig. 8: Six-day old juvenile of *Scincus scincus cucullatus*

Fig. 9: Six-day old juvenile of *Scincus scincus cucullatus*, dorsal view

