



elaphe

ABSTRACTS



06/2020

Dear DGHT members,
in 2020 we started to summarize some of the main articles of our elaphe journal in English, for our non-German speaking members. These summaries have been compiled by Beate Pfau.

A small snake with a large natural distribution area – *Elaphe dione*

by Rainer Fesser

The main articles in this elaphe issue are introductions of rather well-known Colubrids, and they contain some not so well-known facts, too.

In the first one of these portrayed colubrid species is the Steppe rat snake, *Elaphe dione*. This species is unfamiliar to most snake keepers, and it is said to be rather unspectacular. In fact, these snakes are underrated as terrarium animals, although there are many different and sometimes really striking colour and pattern variants, as shown in the photographs. The animals are diurnal and not really shy, and their requirements can easily be met in a terrarium. Females usually attain a length of 1 m, the maximum length might be 1.6 m. The males remain smaller, adults are usually 85 cm long, with a maximum attainable length of about 1.35 m.

The species has a large natural distribution area, from the Ukraine in the west to the Pacific Ocean in the east, and from Siberia in the north to far into China in the south. Typical natural habitats are steppes, semi-deserts, open forests and marshlands, and the species is also found in agricultural areas, for example on the edges of rice paddies.

In Central Europe these snakes can be kept and bred in outdoor terraria without additional heating year-round. For indoor terraria it is important to have a significant day-night temperature difference, and an annual temperature cycle with cold hibernation (preferably below 8° C in mid-winter) and soil surface temperatures of 35-40 °C, under the spotlight, in summer. Since the snakes are not large and not too active, a terrarium size of 0.5 m² surface area for two animals may be sufficient. Males usually eat only once before mating, resuming to feed only after the mating season, which lasts about one month, and then eating voraciously for three more months

before the next fasting time which will last until late autumn. Females accept food until half the gestation time is over, then stop feeding for 4 to 6 weeks, resuming to feed after egg deposition, for one more month. The annual feeding / fasting cycle is dependent on the local form, and for example in animals from northern Mongolia it is pronounced, while animals from eastern China will perhaps accept some food during the whole activity period. If the snakes accept food, should be fed every 3 to 4 days, since it is almost impossible to overfeed them, but animals that have been underfed often die during hibernation. *Elaphe dione* can be fed with mammals like mice and rats, and they can swallow rather large chunks. Feeding them with chicks or eggs is also possible, but this kind of food will cause watery and rather smelly droppings.

Mating begins directly after hibernation, at about 12 °C, usually after the female has shed her skin. Autumn matings do occur, and *Amphigonia retardata* (sperm storage in the uterus so that the females will lay fertile eggs without previous copulation) has been observed for up to 5 years. Some males are stressing the females by perpetual courting, and at the latest when the females cease to bask, the males should be kept separately for some time. The gestation and incubation times are interrelated, in females from the northern distribution areas the



Elaphe dione from eastern China Photo: R. Fesser

gestation is longer and the eggs have a shorter incubation than in females from more southern areas of the species' range. There is usually one clutch per year, with 5 to 25 eggs, depending on geographic origin, but also on size and previous feeding of the female. The hatchlings will usually not feed before hibernation. Early hatchlings should undergo an early artificial hibernation in a refrigerator for two months, to prevent deaths from starvation.



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Green male from Altai Region Photo: R. Fesser

The lifespan of *Elaphe dione* is usually 15 to 20 years, some of the author's captive snakes even lived to about 25 years. These snakes can get rather tame, they are often colourful and not too large, and they can be kept in nicely planted enclosures. It is well understandable that people, once they got to know more on them, will feel attracted.

Husbandry of the Yellow Rat snake and the Amazon Puffing snake – *Spilotes* spp. in the terrarium

by Roman Astheimer

The neotropical genus *Spilotes* contains two species, *S. sulphureus* and *S. pullatus*. *Spilotes* are large, rear-fanged, colubrids, the confirmed maximum length of *S. pullatus* is 2.7 m, and in *S. sulphureus* it is 3 m. They live mainly arboreal, but they come down to the forest floor for searching prey, which consists mainly of mammals and in smaller quantities birds, mainly chicks. *S. sulphureus* might also prey on lizards, since this species produces venom which contains a lizard-specific toxin additionally to the mammal-specific toxin.

The splitting of both these species into subspecies and perhaps even new species is still under discussion, and genetic research is underway. *S. sulphureus* has a distinct juvenile white or pale grey ground colour with transverse brown or grey bands until the age of about one year. For both species there are several colour forms in adults, some of these are shown on the photos.

These diurnally active snakes should be kept in spacious, abundantly planted "rainforest"-type terraria with elevated places for resting at different distances to the UV-B lighting. When basking some snakes flatten the body and inflate the neck and expose it to the main light cone. Once daily the terraria should be thoroughly sprayed, and then the snakes will drink from the drops. *S. pullatus* rarely come down to the water dish for drinking and almost never for bathing, while *S. sulphureus* may lie in their water basin for hours. The substrate on the terrarium floor should be a 25 cm deep mixture of sand and soil, covered with dead leaves, and inhabited by a cleaning crew of woodlice, springtails and millipedes. Nevertheless, the excrements must be removed carefully to avoid bad smells.

If the snakes cannot seclude themselves, due to insufficient depth of the terrarium they might behave aggressively towards the observer, but in large terraria (of perhaps 90 cm depth) they get relaxed, and after some time will even tolerate being pushed aside when the terrarium is cleaned, or they can be gently grasped and brought back when they have left the terrarium. It is possible to keep pairs or small harem groups of *S. pullatus* together, but



Spilotes pullatus Photo: R. Astheimer

keeping two males in the same terrarium will lead to fighting. The author could keep two males *S. sulphureus* together for a certain time, but perhaps only without females being present.

It is possible to keep the adult *S. pullatus* together with Poison Arrow frogs from the same region, in the author's terrarium the community with *Dendrobates tinctorius* worked well, and the little frogs even climb on the snakes to feed on small insects which are attracted to the snake's skin. In the terrarium of *S. sulphureus* lives a group of *Ranitomeya imitator*, and it is fun to watch the frogs occupying the bromelias in the terrarium.



Spilotes sulphureus Photo: R. Astheimer



Keeping and breeding the Checkered Garter snake (*Thamnophis marcianus marcianus*)

by Alexander Bonsels

Garter snakes are popular terrarium animals, and *Thamnophis marcianus* is no exception. The maximum length of this rather small Garter snake is 50 to 100 cm, with a marked sexual dimorphism: The females get much larger than the males. The area of distribution of *T. m. marcianus* in the USA and Mexico, from southern Kansas in the north to southeastern California in the west and Texas in the east, with the southernmost localities in northern Veracruz in Mexico. An isolated population occurs at the Gulf of Tehuantepec. The two other subspecies live farther south and are not known to be kept in the terrarium.

These snakes inhabit dry grasslands and semideserts, but they need water nearby, and there are even some semi-aquatic populations known from south-eastern Arizona. In southern Texas they can be encountered in gardens and



Thamnophis marcianus marcianus Photo: A. Bonsels

backyards, too. They are usually active during the day, but when the temperatures are high, they may switch to a nocturnal activity time.

When acquiring Garter snakes better search for captive-bred animals and avoid imported wild-caught animals, since these often carry parasites and may be really delicate. Well-acclimated snakes are very active and need spacious terraria, temperatures from spring to autumn should be at 22 to 28 °C by day, with a spotlight heating up the

basking place to 30-32 °C surface temperature for some hours. At night the temperatures drop to normal room temperature. Cool hibernation is necessary for the health of the snakes. The soil, a mixture of bark compost, moss and soil, and covered with dead leaves, should be kept moist. Really damp conditions must be avoided, spraying the terrarium two or maximum three times a week with tepid water is sufficient. Pieces of cork bark and artificial plants offer hiding places, and a wet box should be provided, too. A water basin is placed in the coolest corner of the terrarium. Since the snakes use this as a toilet it should be easy to take it out for cleaning.

These snakes are proven escapees, and they will even find a way out between the sliding glass planes of the terrarium if no precautions are taken. From September on the temperatures should be lowered and the feeding is reduced, and from the beginning of November temperatures should be kept below 19 °C for 6 to 8 weeks.

Garter snakes are usually fed with fish, often with whole frozen European smelt (*Osmerus eperlanus*) which have to be thawed and vitaminized before feeding them to the snakes. It is essential to add vitamin B, because thawed smelt and many other feeder fish may contain thiaminase. Feeding unsupplemented fish to the snakes can cause neuropathological symptoms. Adult snakes should be fed every 5 to 7 days, juveniles every 4 to 5 days. It is possible to wean *T. marcianus* to feeder mice if they are first rubbed with fish mucus or fish oil, but then the feeding intervals should be longer, because mice are more nutritious than fish.

Breeding groups of one male and two females are recommended, because the males are rather pushy. Courting and copulation begins directly after hibernation, and the young snakes are born usually in August and September. *Thamnophis marcianus* is ovoviparous, two litters of five to fifteen young snakes per year are possible, and litters of up to 31 animals have been observed. The new-born snakes shed their skins within the first days, after which they accept their first feeding. Most animals will readily accept pieces of fish, but reluctant feeders may take earthworms first. The juveniles are best reared singly in small containers to control their feed intake. In *T. marcianus* up to 20 % of the juveniles will not feed and succumb for unknown reasons within their first week of life. Since the juvenile snakes might have difficulties in shedding and manual removal of the old skin is difficult, I recommend lining a plastic container with very coarse aquarium filter mat material, and have cubes of filter mat material available. The snake is then put in the



container, which is filled with the filter foam cubes and thoroughly soaked with water, and left to crawl around for about one hour.

Thamnophis marcianus are a really nice snakes for the terrarium, the animals are active and easy to care for, they rarely bite or use the foul smelling of their scent glands, and they often get used to their humans, coming to the terrarium front to ask for food, and we hope to see them more frequently in terraria again.

Species conservation measures for the Sand lizard in Schleswig-Holstein

by Janis Ahrens

The reptile of the year 2020/21, the Sand lizard (*Lacerta agilis*), has been classified as "least concern" on the IUCN Red list, but the populations are already decreasing range wide. On the northern edge of the distribution area, the situation of the species is more serious, and in Schleswig-Holstein it is already endangered ("stark gefährdet"), mainly due to fragmentation, degradation or even loss of suitable habitats. The Sand lizard is the umbrella species for these habitats which were once typical for northern Germany, and since this species is quite popular it can serve as a mascot for the necessary conservation projects.

The first step for planning reasonable conservation measures is an analysis of the situation, and it turned out that the reduction of the typical dwarf bush heathland from about 17% in the middle of the 19th century to 0.2% today was the main risk factor for the lizard and other animals of this habitat type. After acquiring former heathland areas, the habitat restoration measures could be planned. If remains of the most important habitat structures, like tree stumps, or stone heaps, or open, unvegetated areas of sand or bare soil were still present, they could be exposed and restored, and other structures could be created. Scattering mowed material from other lizard habitats helped to re-establish the natural plant communities. In some areas it was even necessary to change the relief by creating soil heaps with partially steep slopes, or stone walls, or ditches. Of course all these construction activities have respected the time of breeding and rearing of the resident animals in the area. The most important habitat improvement and management measure was mowing / scything

the grassy vegetation, sometimes combined with extensive grazing with robust cattle, horses, sheep and goats. Since the population density of the Sand lizard is already low and the remaining natural occurrences are no more connected by corridors of suitable habitat, the recolonization of the restored areas had to be carried out by translocating animals from selected populations or by reintroductions of lizards from special ex-situ breeding projects.

Most of these habitat alterations and constructions are illustrated by photos, which show how the work has been done, and there is also information and advice on financing the species and nature conservation measures.



Captive keeping and breeding of *Lacerta agilis* Photo: GFN

Recommendations on Importing Living Amphibians

by Citizen Conservation & DGHT

In the "magazine" part (herpetorama) of this elaphe, which is considerably longer than usual, the recommendation on importing living amphibians are summarized. The document itself is available in the download area of the leading organisation Citizen Conservation (<https://citizen-conservation.org>) as well as on the service page of the DGHT



(<https://www.dght.de/service>), and there it is accompanied by an explanation on the necessary quarantine procedures. Both documents are available in German language only, therefore the highlights will be summarized here.

The aim of this policy paper is to minimize the risk of the introduction of pathogens and to propose preventive rules for importing all kinds of amphibians into the EU. These rules should allow further imports of living amphibians for scientific purposes, for zoos, for ex-situ breeding projects and also for skilled private keepers and breeders. The proposed necessary precautions are practicable and agreed to by the relevant specialists.

Recommendations:

1. Generalized interdictions of importing or transporting animals would be really detrimental to species conservation projects and to any research on amphibian declines. Instead a cooperation of researchers, animal conservation organisations, private keepers and field herpetologists is necessary.

2. The disease prevention measures will take effect only if all amphibian imports are monitored, and not only the imports of legally protected species as it is still done today.

3. Quarantine of all amphibians which are imported into the EU is mandatory. The standards for the quarantine facilities should be appropriate, but practicable and feasible. The necessary quarantine is not meant to lead to a de facto import ban for living amphibians. The quarantine duration is not less than three weeks, and the measures must be supervised by a competent veterinarian.

4. A consistent testing and treatment regime has been established according to the actual state of knowledge. It will be adjusted by an appointed board of specialists as the necessity arises.

5. A certification system for testing facilities should be defined. It will harmonize the different test methods into a simple and consistent procedure.

6. A reporting and central registration of positive test results for the three diseases is necessary. The obligation to notify the authorities and the information disclosure to the OIE (World Organisation for Animal Health) has not been implemented correctly yet, but it would help to keep track on the infection spread. Additionally, the importers should be asked to update the international database <https://amphibiandisease.org/> with anonymized data, because these data are accessible to all stakeholders.

7. A task force on emerging infectious diseases should be installed. The specialists will be able to recognize, analyse and monitor new diseases and recommend the necessary measures quickly and in a targeted manner. The amphibian trade should be integrated into an „early warning“ network for the detection of arising relevant problems.

8. The research on the three amphibian diseases Bsal, Bd and Ranavirus should be intensified, and promotion and sponsoring of research projects on other relevant pathogens is urgently needed.

9. Educating and activating private keepers of amphibians on hygiene measures and on the necessity of regular testing is necessary. The amphibian keeper associations should intensify their educational work.

In the addendum document on the DGHT service page details are given on the three actual epidemic amphibian diseases Bsal, Bd and Ranavirus, general hygiene measures are proposed, and preventive sanitary measures as well as biosecurity requirements for field work and amphibian husbandry are given, including recommendations disinfection and, if possible, treatment of infected animals.

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