herpy

SNAKES

Plains Garter Snake

Thamnophis radix

Thamnophis radix is a slim, striped garter snake from the prairies and open grasslands of central North America. It has a yellow or orange stripe down the back and grows to 40-70 cm. It is very tolerant of cold and gives birth to live young. It is hardy and can be kept on thawed mice, but it escapes through the smallest gaps.

Family: Colubridae

KEY FACTS

THE ANIMAL

Adult size	**40-70 cm** total length incl. tail
Lifespan	**5-10 years**
Active	**By day**
Lifestyle	**Terrestrial**
Habitat	**Wetland and temperate woodland and meadow**
Difficulty	**Beginner**

CARE

Min. enclosure	**100 × 50 × 50 cm** L × W × H for 1 adult
Temperature, day	**23-27 °C**
Basking spot	**29-32 °C**
Temperature, night	**18-24 °C**
Humidity	**35-60%**
Water	**Water dish**
UVB	**Recommended** Ferguson zone 2
Winter rest	**8-15 °C** 8-16 weeks
Diet	**Vertebrates and worms/snails**
Kept	**Singly or in groups**

BREEDING

Reproduction	**Live-bearing**
Sexually mature	**24-36 months**
Litter size	**5-60 young**
Clutches per year	**1**
Gestation	**83-102 days**

PROTECTION AND PAPERWORK

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

About the species

Thamnophis radix is a slim garter snake with keeled scales in 19-21 rows and an undivided anal plate. The ground colour is dark brown to dark greenish, and a yellow or orange stripe runs along the back. On each side a paler, often greenish-yellow stripe runs along scale rows 3 and 4, and a row of black spots lies between the side stripe and the ventral scales. The sides may have reddish tones. The upper lips have distinct black vertical bars, and many animals have pale yellow spots on top of the head. The belly is grey-green with small dark spots along the edge.

Adults are 40-70 cm long, and a few reach up to 110 cm. Males have more ventral and tail scales than females, a slightly longer tail and small tubercles on the chin shields. Weight is not documented. In its first year the snake grows about 1 cm a week, after which growth slows. Newborn young are 12-24 cm long and weigh 1-2.5 g.

The species gives birth to live young. It has a very weak venom, which is harmless to humans. When threatened, the snake hides its head, flattens its body or coils up, lashes its tail, releases a foul-smelling secretion from the cloaca and bites. Two subspecies were formerly described; they are no longer recognised, because the differences are slight and the ranges overlap. The species name is Latin for "root" and possibly refers to the Root River in Wisconsin.

Distribution and habitat

Thamnophis radix lives on the prairies and plains of North America, from north-eastern New Mexico, Oklahoma and northern Texas in the south to southern Alberta, Saskatchewan and Manitoba in the north. To the east the range extends through Minnesota, Iowa, Missouri, Wisconsin and Illinois to Indiana, and there is a small population in Ohio. To the west it reaches eastern Wyoming and Colorado. The species occurs from about 120 m to 2300 m above sea level, but prefers to stay below 1800 m.

> **Native range:** Canada and United States.

HABITAT

Thamnophis radix lives in meadows, prairies and other open grassland near water: ponds, streams, marshes and waterholes. It is also found along rivers and on vacant lots in towns and suburbs. Where it shares its range with *Thamnophis sirtalis*, it generally uses drier habitats than that species.

The snake is active by day at air temperatures of 21-29 °C and becomes nocturnal when the temperature rises above 31 °C. It is active from March to November, depending on the region, and is one of the most cold-tolerant snakes in North America: on mild winter days it comes out to bask. For hibernation it goes down into rodent burrows, ant mounds, rock crevices and other gaps, often many together. The snake stays in a small area for years, and populations can be dense, at 70-120 animals per hectare.

Its food is earthworms, slugs, leeches, frogs, toads, salamanders and their larvae, fish, mice and the occasional bird. The snake finds prey by following scent trails. The species is not threatened worldwide, but populations in towns and suburbs are declining because of building and pesticides, and in some US states it is protected or on lists of vulnerable species.

Read more: Brumation and the seasons

Care

THE ENCLOSURE

Little species-specific knowledge exists about keeping *Thamnophis radix*. The figures in this section and the following ones are borrowed from garter snakes in general, especially *Thamnophis sirtalis*, which has the same size, lifestyle and requirements.

An adult *Thamnophis radix* needs an enclosure of at least 100 × 50 × 50 cm (length × width × height). The species is active and inquisitive, so the furnishings matter. Young snakes can live in a small, secure box of about 40 × 20 × 25 cm, because an enclosure that is too large makes them feel exposed; move them up as they grow.

The substrate should be clean and dry, but absorbent. Aspen shavings, coconut fibre, cypress mulch or paper pulp in a layer of 3-5 cm work well. Kitchen paper is easy to change and suits young snakes and temporary use. Avoid sand, cat litter and cedar, pine and other aromatic wood. A layer of leaves on top provides cover.

Provide at least two hides, one at the warm end and one at the cool end, small enough that the snake lies tightly coiled in them. Branches, cork bark, flat stones and sturdy plants add structure, but are not necessary.

The species escapes through even small openings: if it can get its head through, the rest follows. The lid must fit tightly and be locked, all gaps and cable holes must be sealed, and the mesh must be fine enough that a young snake cannot squeeze through. Enclosures with front doors and tight joints are the most secure. Remove droppings as needed, and change the substrate completely every two to three months.

TEMPERATURE

There must be a clear temperature gradient. The basking spot should be 29-32 °C measured on the surface, the cool end 23-27 °C and the night 18-24 °C. Use a halogen spotlight above the enclosure, and place a flat stone or board under it so the snake can lie in the warmth. If the bulb is inside the enclosure, it needs a protective cage. The heat source is switched off at night.

The species comes from a cooler climate than many other garter snakes and is most active at 21-29 °C. Air temperatures above 33 °C are dangerous: an overheated snake rushes around with its mouth open or lies in the water bowl, and it must be cooled down in cool water at once. Never put the enclosure in direct sun, and avoid heat rocks. Measure with digital thermometers with the probe at the basking spot and at the cool end.

In winter the daytime temperature can be lowered to 16-20 °C. For breeding, or if the snake stops eating by itself in autumn, it can go into hibernation (see Breeding).

Read more: Heat and temperature

HUMIDITY AND WATER

The air humidity should be 35-60 %, highest at the cool end and at night. The enclosure should be dry, because persistently damp conditions cause blisters on the belly and fungal infections. Mist only lightly when needed, and place damp sphagnum in a hide at the cool end as a humid chamber for shedding; the young are the most vulnerable to drying out.

The snake needs a water bowl large enough for the whole body to lie in. It is not an aquatic animal and needs neither to swim nor a water section. It often bathes, especially before shedding, and often leaves droppings in the water. Change the water at least once a week and at once if it is dirty.

Read more: Humidity, misting and ventilation

LIGHTING AND UVB

Thamnophis radix is diurnal and thrives in strong daylight. UVB is not strictly necessary, but is recommended. Use a T5 HO tube of 5-6 % (Ferguson zone 2) covering half of the enclosure over the warm end, and aim for a UV index of 2-3 at the basking spot. The tube's distance from the basking spot depends on whether there is mesh in between; ideally measure with a UV meter.

The light is on for 14 hours in summer and 10 hours in winter, with gradual transitions. Without UVB, the food should occasionally be dusted with a supplement containing vitamin D3.

Read more: Lighting and UVB Read more: Calcium, vitamins and supplements

FEEDING

In the wild *Thamnophis radix* eats earthworms, slugs, frogs, toads, salamanders, fish and the occasional mouse. In the enclosure, frozen and thawed mice are the simplest diet: they provide complete nutrition and less foul-smelling droppings than worms and fish. Many animals take them without fuss; otherwise rub the prey with fish or earthworm so the scent awakens interest.

Young snakes get earthworms cut into pieces, small guppies and platies and pieces of frozen pinky mice. Move them over to mice as soon as possible. Never use red compost worms (*Eisenia fetida*), which are toxic to the snake. Many feeder fish contain thiaminase, which breaks down vitamin B1; a fixed diet of them causes B1 deficiency. Frogs, toads and salamanders should not be used, because they often carry parasites, and some salamanders are poisonous.

Prey should be no more than 1.5 times as wide as the snake at its widest point. Newborns are fed every other day, young animals every 3-5 days and adults every 4-7 days, least often when they get mice. Never feed every day, as it causes obesity. Mice need no supplement; with a diet of worms and fish, dust the prey lightly now and then with calcium and a multivitamin with D3, at most a couple of times a month.

BEHAVIOUR AND HANDLING

Thamnophis radix is quick and alert, but usually becomes calm if handled regularly from a young age. Let new animals settle in for about two weeks, and start handling them only when they are feeding steadily. Keep the first sessions to 5 minutes at most, and lift the snake from below with a flat hand so the body is supported. It does not hold on like a constrictor and slips easily out between the fingers. Wash your hands after handling.

When frightened, the snake releases a foul-smelling secretion and may bite. The bite is harmless, but can cause small scratches. Wild-caught animals are often defensive.

In the wild the species lives alone outside the mating season and hibernation, and in captivity it does well on its own. If several are kept together, they must be of the same size and have a considerably larger enclosure, new animals must first be quarantined for 1-2 months, and all must be fed separately, because two snakes easily seize the same prey. Do not keep males and females together unless young are wanted.

Read more: Buying animals: captive-bred, wild-caught and transport

Breeding

SEXUAL MATURITY AND SEXING

Males have a slightly longer tail than females and small tubercles on the chin shields. Sex can be confirmed by probing, which should only be done by an experienced keeper or a vet. Females are sexually mature at 2-3 years of age. The female should be in good condition before she is put to breed.

MATING

In the wild the snakes mate in April and May, just after hibernation. The males follow the females' scent trails and crawl alongside the female with small, rippling movements while pushing against her with the snout; the female may mate with several males. A hibernation of 8-16 weeks increases fertility; it is kept at 8-15 °C and never below 5 °C, and the species tolerates cooler conditions than most other garter snakes. Stop feeding about three weeks before cooling, so the gut is empty, give the snake a lukewarm bath so that it empties itself, and lower the temperature gradually. The snake must always have access to water.

When hibernation ends, the temperature is raised gradually, and food is offered again after a few days. Put the male with the female, and remove him again after a few days.

EGG-LAYING AND CLUTCHES

Thamnophis radix gives birth to live young and does not lay eggs. Gestation lasts 83-102 days. A litter is 5-60 young, most often 10-20, and large females have the largest litters. The female has one litter a year. In the wild the young are born from June to October.

Give the pregnant female plenty of food, warmth and water, and keep the enclosure quiet. After giving birth she is thin and needs extra food for the first month.

INCUBATION

There is no incubation, because the young develop inside the female's body and are born alive. The pregnant female needs the same temperature gradient as usual and must not become too cold, so that the foetuses develop evenly.

Remove foetal membranes and dead young quickly. The young are independent from the first day and look like small versions of the adults. The female does not care for them.

Read more: Incubating eggs

REARING THE YOUNG

Move the young to small, completely secure boxes, singly or in small groups of the same size. The boxes should have a warm and a cool end, kitchen paper as substrate, a hide and a shallow water bowl. The young can squeeze through very small gaps and are defensive when fed.

The young typically eat after their first shed. Offer two or three small earthworms, pieces of frozen pinky mice, preferably scented with earthworm, and otherwise small guppies or platies. Feed every other day at first, and get them over onto mice as soon as possible. The young are 12-24 cm at birth and grow about 1 cm a week in the first year.

Health and common mistakes

Thamnophis radix is hardy, but errors in diet and climate cause typical problems:

- Internal worms, especially from live fish, wild-caught frogs and worms. Symptoms are weight loss, swellings and a popping sound when breathing, but the animal can also seem healthy for years. Frozen food (at least 30 days) prevents them. Have a faecal sample examined by a vet when you buy a new animal and if you suspect a problem.
- B1 deficiency in snakes that live on fish containing thiaminase. Signs are poor coordination, later convulsions. It requires prompt treatment by a vet.
- Blisters and skin infection on the belly with substrate that is too damp or dirty.
- Shedding problems when the air is too dry, especially in young snakes: old skin stays on the eyes and tail. A damp hide helps.

- Mites.
- Burns from heat lamps without a cage.
- Stomatitis and pneumonia at temperatures that are too low.
- Obesity from feeding too often.

A healthy snake has clear eyes, a plump body and smooth skin, and eats regularly. Reptiles hide illness for a long time, so contact a vet with experience in reptiles if the snake loses weight, refuses to eat for a long time, has sores or swellings or breathes with its mouth open.

Read more: Common diseases and signs of illness

Always ask someone who knows

This guide is a good place to start, but it cannot replace experience. Animals differ, and much of what matters most is learned from people who have kept the species for years. Talk to a breeder, an experienced keeper or a vet who knows reptiles and amphibians before you get the animal - and again if anything looks wrong.