

AMPHIBIANS AND REPTILES

Salamandra salamandra (Linnaeus, 1758) - **Fire salamander**

The species reaches a tail length of 15 to 18 cm. The poisonous glands of the head are well developed and visible, and the limbs are relatively short and massive. The back of the body is black, with different in shape and size yellowish or yellow-orange spots. The abdomen of the species is black, rarely dark grey. The larvae have well-developed outer gills and a rounded tail fin and most often are light grey to black, with small spots on the back. With their growth, the yellow spots are gradually formed. In case of severe irritation, the skin glands of the salamander produce white secretion that has a burning effect in contact with mucous membranes and open skin wounds.

The salamander is spread from the Iberian Peninsula to the west to the Carpathians to the east. The north-eastern border of its range in Europe passes through the southern part of the peninsula of Jutland and reaches the southern parts of the Iberian, Apennine, and Balkan peninsulas to the south. In Bulgaria, it is found in almost all mountain areas and woodlands in the country except Strandzha and Sakar. It is absent in the Thracian Plain, Dobrudzha, and most of the Danube Plain. In the mountains, it usually reaches about 1,600 m above seal level but has been also found at 2,350 m above sea level in Pirin.

The species is active at night and during the day, too, in wet and rainy weather. The salamander is highly moisture loving and attached to deciduous and especially old beech forests. It spends on land almost all its life, with the exception of the larval stage. It is usually active from April to November but it can be observed during the winter months in warm and rainy weather. The adults feed mainly on slugs, rain worms, slow moving arthropods, and others; the larvae feed on small crustaceans and insects. The fertilization of the species occurs on land in autumn, with the female being able to give birth several times for 2-3 years thereafter. The reason is that the sperm can preserve its fertility for a long time in the oviducts. Females give birth to fully developed larvae, immersing themselves in the water. Metamorphosis usually occurs after 2-3 months but can last for more than a year in cold and shady watercourses.

A major threat to the salamander is the clearing of deciduous forests and the drought caused by it. The species is protected by Annex III to the BDA and the Berne Convention. Categorized as an LC (least concern) species in the IUCN red list.

Ichthyosaura alpestris (Laurenti, 1768) - **Alpine newt**

The total length of the body reaches about 12 cm, with the females being slightly larger than the males. In the males, the back is usually grey-bluish, with or without slightly contrasting spots; in the females, it is grey-brown with a marble pattern. The abdomen is orange to bright red and, unlike other types of Bulgarian tritons, has no dark spots. During the breeding season, the males have a low, non-jagged crest that merges backwards with the tail fin; on the sides of the body, a silver stripe passes dotted with dark spots, and, below it, there is a bluish stripe without spots. The females have no crest but, longitudinally on the back and tail, often have a slightly contrasting, thin yellowish-brown line; on the sides of the body (at the border between the sides and the abdomen), a light-grey stripe passes along, dotted with dark spots, but there is no blue stripe below it.

The range of the Alpine newt covers Central Europe and part of Southern Europe: from the northwest continental parts to the Carpathians to the east to the northern parts of the Apennine and mountain ranges of the Balkan Peninsula to the south, and to the Peloponnese (there are isolated populations in the northern part of the Pyrenean and the southern part of the Apennine peninsulas). In Bulgaria, the alpine newt is considered a glacial relic. It has been found only in some mountains: Western and Central Stara Planina (isolated habitats), Rila, Western Rhodopes, Osogovo, and Sredna Gora. The known habitats are between 900 and 2,500 m above sea level.

The Alpine newt is active from April-May to September-October, depending on the altitude and the climatic conditions of the particular year. The breeding season begins immediately after hibernation and lasts for about a month, after which most tritons leave the water. Fertilization occurs in the water and is preceded by specific mating dances. The female lays from several dozen to several hundred eggs and sticks them separately to the underwater plants. The metamorphosis ends in the second half of the summer or in early autumn, after which the youngsters leave the water and live on land for the next 1-2 years (until reaching sexual maturity). The Alpine newt feeds mainly on small aquatic and terrestrial invertebrates (worms, crustaceans, insects, etc.) The species is most active at night but also has daily activity during the water phase. It probably overwinters on land.

Major threats to its existence are the drought caused by the clearing of deciduous forests as well as the direct destruction of the breeding ponds (drying out of pools, marshes, etc.) or their harvesting with predatory fish. The species falls under Annexes II and III of the BDA as well as Annex III to the Berne Convention. The Alpine newt is also listed in the Red Book of Bulgaria as VU (vulnerable) and in the IUCN Red List as LC (least concern).

Bombina variegata (Linnaeus, 1758) - **Yellow-bellied toad**

The yellow-bellied toad is a small frog reaching a length of 5.5 cm in Bulgaria. The body is short and stout, the limbs are also short. The head is wider than long, without parotid glands, a tympanic membrane, and external vocal sacs. The surface of the back of the body is strewn with uniformly scattered small groups of warts, which during the breeding period have black thorn-like tips in the males. The main colour of the dorsal side is mostly brown but can vary from greenish-brown and olive green to almost black; four dirty yellow spots are often observed: two smaller ones behind the rear part and two bigger ones on the back. The abdomen has a bright yellow to bright orange basic colour, with uneven grey and black spots. The main background has a number of black dots: pores of glands. The yellow spots of the abdomen merge with those on the underside of the limbs; the tips of at least a few of the toes are always yellow. The webs are well developed. The males have an internal vocal sac and produce characteristic sounds for which the frog has got its name.

The yellow-bellied toad is spread mainly in Central and Southern Europe. Its range extends from the Atlantic coast to the Carpathians to the east. To the south, it meets the north-eastern parts of the Apennine Peninsula and the southern parts of the Balkan Peninsula. In Bulgaria, it is found in a large part of the country, with the exception of the large valleys and plains, where only a few isolated habitats have been found. The species has not been located near the Black Sea coast (the eastern quarter of the country). In the mountains, it usually reaches about 1,500 m above sea level.

The species is predominantly active during the day and at dusk but, during the breeding season, the animals are active at night, too. The annual activity of the species continues from March to October. The breeding season may last from March to the end of July. The eggs (from 50 to 200) are spread on small clumps of 20-30 and may lie in small groups or separately. The species can be observed in and near watercourses of all types: streams, lakes, spills, rivers, ponds, dams, tracks along black roads, etc. Terrestrial invertebrates predominate in the food, with beetles being the main component. In case of danger, the toad often takes a warning posture by rolling up its spine and the limbs (the so-called toad's reflex) and shows the bright coloration on the underside of the body. When caught, it releases white secretion that strongly irritates the eyes and mucous membranes of the nose and throat.

A major threat to the yellow-bellied toad is the human-induced drought: the clearing of deciduous forests and the direct reduction of river runoff in the construction of mini-hydropower plants. The species falls under Annexes II and III of the BDA, Annexes II and IV of Directive 92/43 EEC, Annex II of the Berne Convention, and the IUCN red list as LC (least concern).

Bufo (Linnaeus, 1758) - **Common toad**

The common toad is the largest European representative of the tailless amphibians order. The females are considerably larger than the males, with the largest measured individual in Bulgaria being 15.2 cm long. The body is massive, rounded, and stout. The limbs are relatively short and massive. The eye iris is copper to golden-red and the pupil is horizontally-elliptical. The parotid (poisonous) glands are large, clearly visible, and spaced at their rear ends. The tympanic membrane is well recognizable and the articular warts on the toes are pair ones. The skin is dry and covered with numerous warts. The main tone of the back side is in different shades of brown and grey, often with unevenly scattered rust to reddish spots. The neck and abdomen are canescent or yellowish and often marbled with dark spots. The males have no vocal sacs so their sounds are deaf and not always well heard. When scared or, for example, caught by hand, the animals release whitish poisonous secretion that strongly irritates open wounds, eyes, and mucous membranes.

The common toad is spread across almost all of Europe; it is absent only in the southwest parts of the continent. In the eastern parts of the Scandinavian Peninsula, its range goes north of the Polar Circle. Outside of Europe, it reaches Lake Baikal to the east and can also be found in the northern parts of Asia Minor. In Bulgaria, the species is spread throughout the country and; in the mountains, it usually reaches about 1,500 m above sea level but has also been found higher (up to 2,000 m above sea level, in Belasitsa).

The common toad is active at dusk and at night but can be observed during the day, too. Its preferred habitats are wet deciduous forests but the animals can be found in a number of other habitats: rocky gorges, cultural areas, parks and gardens, populated areas, etc. The watercourses used to lay the long cords of eggs are of the most varied type: swamps, lakes, marshes, canals, slower stretches of streams and rivers, etc. Typical are the massive spring migrations from the terrestrial habitats to the breeding sites. The larvae are small, with black coloration; at the sites of their hatching, they form characteristic mass clusters with a length of tens of meters. The adults stay in the water only during the breeding season and the larvae metamorphosis lasts from July to November. It feeds on insects, myriapods, arachnids,

worms, snails, and small vertebrates: slowworms, snakes, murids, and shrews. They overwinter on land, usually not far from the watercourses of reproduction.

A major threat to the species is the clearing of deciduous forests as well as the drought caused by it. Traffic and deliberate killing by humans are also threats. The species is protected by Annex III to the BDA and the Berne Convention. Categorized as LC (least concern) in the IUCN red list.

Hyla arborea (Linnaeus, 1758) - **European tree frog**

The European tree frog is a small frog reaching the maximum size of 5.2 cm for our country. The body is slightly stout and the limbs are long and slender. The main colour of the back side is mostly grassy green but there are also individuals coloured in different shades of brown and grey and, very rarely, in light blue. Typical is the longitudinal dark line starting from the nasal holes and reaching the back of the body and thigh. The line passes laterally along the body and divides the back, green-coloured half of the body from the whitish to yellowish abdomen. The males have an unpaired vocal sac, which makes their throats look darker and wrinkled. One of the most typical features of the genus, respectively the species, is the tips of the toes extended into suction pads. The strong sounds produced by males during the breeding season can be heard at a great distance.

It is spread in North-Western Africa, Western, Central, Middle and Southern Europe, Northern Turkey, and Central Iran to the south-east. The north-eastern border of its range in Europe passes through Southern Denmark, South Sweden, South Lithuania, South Belarus to the mouth of Kuma River into the Caspian Sea. It can be found on Corsica, Sardinia, Crete, the Crimea, and the Caucasus lands. In Bulgaria, the European tree frog is widely spread from sea level to about 1,200-1,300 m above sea level. The highest habitat of the species has been registered in Rila: 2,300 m above sea level and, in an elevation slightly more than 2,000 m above sea level, it has also been found in Pirin.

The European tree frogs most often live near watercourses of different types: rivers, canals, spills, dams, marshes, artificial lakes, etc. The animals are active mostly at dusk and at night, less often during the day. Thanks to the presence of toe suction pads, the species climbs very well and spends much of its life on trees and shrubs. The tree frogs are looking for water, as a rule, mostly during the mating season, which, in Bulgaria, usually takes place from the end of March, the beginning of April to June. The males sing around the clock and produce a loud sound thanks to their large vocal sacs. For this species, it is typical that the males sing for the whole active season. The eggs are laid in clumps that are noticeably smaller than those of the water frogs and are easily distinguishable from them. The number of eggs in the examined clumps in Bulgaria varied between 20 and 60. The larvae have a characteristic high fin and reach up to 5 cm in length. Depending on the location of the habitat, the metamorphosis in Bulgaria can occur between June and September. Overwintering occurs mainly on land, less often in the water. The tree frogs feed on various insects and other invertebrates such as small beetles or caterpillars and spiders.

The species falls under Annexes II and III of the BDA, Annex IV to Directive 92/43 EEC, and Annex II to the Berne Convention. Categorized as LC (least concern) in the IUCN red list.

Rana temporaria Linnaeus, 1758 - **Common frog**

A medium-sized species, which is, at the same time, the largest of the so-called brown water frogs in Bulgaria. The body is stouter than that of the forest long-legged frog and the limbs are shorter than those of the other two types of brown water frog in the country. The back side is relatively smooth, in places with small rounded warts. The basic colour of the back may change from reddish-brown to greyish-brown, dark brown, grey, and greyish-green. Both almost single-coloured animals as well as animals with many dark spots can be observed. The V-shaped spot on the shoulders is always distinct as is the dark temporal spot. During the mating season, the lower legs become deep orange and the throat becomes dark. In the males, the latter is coloured in light blue and the back side has a greyish tint. The back side of most females, at that time, is reddish-brown to brick-red. The webs are relatively well developed and the calling of the males having internal vocal sacs is not particularly strong.

Europe, and the northern border of its range, almost coincides with that of the continent. To the south, it reaches the northern parts of the Pyrenean and the Apennine peninsulas and the central parts of the Balkan Peninsula. To the east of Ural, the species can be found only in the areas of the rivers Ob and Irtysh. In Bulgaria, the mountain frog is spread in the mountainous regions of the country. Most often, it inhabits the belt from 800 to 2,000 m above sea level but has been also found at 2,500 m above sea level, and the lowest known habitat in Bulgaria is 260 m above sea level.

It can be found both in the middle and high forest belts as well as on the open ridge meadows of the mountains. High-mountain lakes, marshes, swamps, spills, pools, etc. are the places for hatching. Migrations to breeding ponds as well as large clusters of animals in them are characteristic. The adult animals leave the water after the mating season but usually keep close to the watercourses. The reproduction starts depending on the areas in which the individual populations live: from the end of January - early February to June. The eggs are laid on large clumps which later spread on the surface and form characteristic "carpets" of caviar. The animals most often overwinter in the water, often forming large clumps at the bottom of the watercourses. However, they do not always overwinter in the watercourse of reproduction. The species feeds mainly on land and mainly on insects.

The species is protected by Annexes II and IV of the BDA, Annex V to Directive 92/43 EEC, Annex III of the Berne Convention, and the IUCN Red List as LC (least concern).

Emys orbicularis (Linnaeus, 1758) - **European pond turtle**

The European pond turtle is a small to medium-sized species (in Bulgaria, it reaches a size of 15 to 20 cm). The form of the shell in the adults is elongated-oval, while in the very young individuals it is almost round. The shell is not markedly dome-shaped as in the terrestrial species but has a much flattened hydrodynamic profile. Typical are the soft joints along the plastron and the bridge, which gives a certain degree of flexibility to the shell. The coloration and pattern of the armour vary, with the main tone going from dark olive green to almost black. The elements of the pattern are yellowish dots and lines that usually go radially from the centres of the scutes to the periphery. There are also completely dark individuals - without

any patterns. The head, limbs, neck, and tail also have bright dots and spots contrasting with the dark, basic colour of the skin. The head is wide, with a blunt muzzle. The toes of the fore- and hind limbs have relatively long nails and there are also webs between them. The sexes differ well along several external traits: the iris in the males is dark orange to red-brown, and in the females it is lemon-yellow to pale orange; the tail of the males is visibly longer and thicker at the base; the plastron in the females is flat to slightly swollen, while in the males it is slightly to obviously indented in its rear third.

The species is sporadically spread in Western, Central, and Southern Europe. In North Africa, there are relict deposits in the north-west parts of the continent. In the north-eastern and eastern parts of Europe, the species reaches the Aegean Sea and, to the east, the pool of the Aral Sea. It is also found in Asia Minor and the Caucasus region and the southern coastal area of the Caspian Sea. In Bulgaria, the European pond turtle is practically spread throughout the country and is absent only in the middle and high parts of the mountains. It can be found from sea level up to 1,100 m above sea level.

The European pond turtle is a daily active species. The animal prefers areas rich in vegetation to basins with a muddy bottom. It can be observed in almost any type of watercourses: rivers, canals, lakes, dams, fishponds, streams, floodplains, swamps, brackish waters, firths along the seashore, etc. Amazing is the tolerance of the animal to high degrees of contamination of the inhabited watercourses. The turtle is not so closely attached to the water and can be observed at great distances from the water basins available in a given area. This helps the animal actively seek new opportunities for displacement or survival for prolonged periods of drought. In the warmer months, it lays one or two times from 4 to 10 eggs and buries them in holes in the ground. The little ones hatch after about 65 to 100 days. They feed mostly on water insects, crustaceans, molluscs, and larvae of frogs and fish (mostly injured and sick). They have been often seen eating carcasses, too. Feeding occurs primarily in the water but animals can catch prey on land, too. Rarely, the food contains plant components, too. The hibernation ends usually in March.

The species is protected by Annexes II and III of the BDA, Annexes II and IV of Directive 92/43 EEC, Annex II of the Berne Convention, and the IUCN red list as NT (near threatened).

Testudo hermanni (Gmelin, 1789) - **Hermann's tortoise**

The largest measured individuals of this species originate from the territory of Bulgaria: from 31 cm to 35.7 cm. Over the last decades, such sizes have been extremely rare, even for the large and well preserved populations. The shape of the shell is typical of the tortoises: dome-shaped. A certain sign for identifying the species is the narrow row of central scutes (longitudinally in the middle of the shell), where the 2nd, 3rd, and 4th scutes are always narrower than the 5th, as well as the well-formed horn spike of the tail. In the males, the spike is much larger and well developed. Another sign of sex differentiation is the distinct indentation of the plastron in its rear part in the sexually mature males, which helps make it more stable in copulation. In the females, the abdominal part of the shell is completely flat. The pattern and coloration of the shell vary. The main colour of the shell is yellowish and may have a brownish hue. The dark spots (dark brown to black) of the side scutes are triangular - along the diagonal of the scute, and those of the central scutes are longitudinal. The plastron has no moving parts and its main colour is identical to that of the carapace. The head can be fully retracted into the shell. The skin is yellowish and may have a brownish or

greenish tinge. The forelegs are visibly flattened at the bottom and the hindlegs are column-shaped.

Its range spreads mainly in southern Europe, from the north-east parts of the Pyrenean Peninsula, through the Apennines, and to the Balkan Peninsula. North of the Danube, it occurs only at Zhelezni Vrata Passage. It is also found on a number of large Mediterranean islands: Balearic, Sardinian, Corsica, Sicily, Malta. In Bulgaria, the Hermann's tortoise is spread in much of the country and is absent in the high parts of the mountains as well as in many places in the Danube Plain. In the most western and central territories of Bulgaria today, its spread is sporadic and the populations are small. The species has been found from the sea shore to 1,400-1,450 m above sea level.

The species is daily active. Preferred habitats are the hilly parts of the foothills in the belt up to 500-600 m above sea level and the animals can be observed in various structured parts thereof: open meadows, outskirts of forests, rocky gorges with scrub, sparse deciduous forests, gullies, etc.; they often enter into different types of cultural areas: vineyards, fields, gardens, and others. The breeding season lasts from the middle of April to the end of May and, in some cases, even longer. Summer and autumn copulations are also no exception. Females can deposit 2 to 3 hatchings a year. The eggs are elongated and their number varies most often from 3 to 5 and up to 8 in individual cases. The hatching of the youngsters occurs at the end of August to early October. Overwintering occurs in holes excavated in the ground (mostly on southern slopes), reaching a depth of 30 to 90 cm, as well as in holes of other animals. The Hermann's tortoise is a very good climber; it can swim well and is extremely resistant even to serious injuries. The food consists mainly of grasses and fruits but feeding on invertebrates can also be observed and, in some cases, on excrements and even carcasses.

A threat to the species is the proximity to human presence and the potential danger of fires caused by people. In many places in Bulgaria, tortoises are killed to be eaten. This is mainly due to a multitude of superstitions related to the fictional "healing" properties of the blood and meat of tortoises. The species is strictly protected by Annexes II and III of the BDA, Annexes II and IV to Directive 92/43 EEC, Annex II of the Berne Convention, and Annex II of CITES. The species also appears in the Red Data Book of Bulgaria with EN status (endangered) as well as in the IUCN Red List as VU (Vulnerable).

Anguis fragilis Linnaeus, 1758 - **Slowworm**

The slowworm (also called long-cripple) is a lizard characterized by the lack of visible limbs and well developed eyelids. The total length of the body can reach 65 cm. The tail is blunted and is two or two and a half times longer than the body. The self-amputation (autotomy) of the tail in danger is a common self-defence response in the species. The tail regenerates very slowly and does not reach its previous length. The mature males are coloured in one tone: beige to light brown. They may have darker spots on the back. The females as well as sexually immature youngsters have two dark side stripes (temporal) that often pass into a dark coloured abdomen. In the middle of the back, there is a thin line (occipital line). Some individuals may have several more pale parallel longitudinal lines. The youngsters are bright, with a bronze tinge and dark, contrasting, almost black occipital and temporal stripes.

The species is mainly found in Western and Central Europe: from the northern parts of the Pyrenean peninsula to the south to the southern parts of the Scandinavian Peninsula to the north. To the west, the range of the species passes north of the Alps and descends through the Adriatic Arc in the southeast to the central mountain areas of the Balkan Peninsula. In Bulgaria, it is mainly found in the south-western part of the country, with Vitosha outlining its northern border.

The slowworm is attached to wet places and is found especially often in deciduous and mixed forests but also in subalpine meadows. It spends much of its life under stones and in different soil cavities. Usually, it digs in foliage or in dense grasses in search of appropriate food. It feeds mostly on earthworms, slugs, insect larvae and, more rarely, with other, mostly slow-moving, invertebrate animals. Usually, it is inactive during the hot hours of the day. It is cold-resistant and active even at temperatures of around 12°C. During the breeding season, the males are actively pursuing the females in their attempts to hold them and copulate with them, with the act sometimes continuing for several hours. An ovoviviparous species. It gives birth to about 10 youngsters and, according to the altitude, the period of birth is stretched from the end of July to the beginning of September. At birth, the youngsters are wrapped in a thin transparent membrane that quickly pierces. When caught, the species tightens and rolls and, in an attempt to be unrolled, it can shed its tail. It is a peaceful animal and, in very rare cases, tries to bite when caught.

A major threat to this species is the clearing of deciduous forests. Intentional killing by people is also a threat. The species is protected by Annex III to the BDA and the Berne Convention.

Ablepharus kitaibelii (Bibron & Bory de Saint-Vincent, 1833) - **European copper skink**

A small lizard. The total length of the body, along with the tail, is approx. 12 cm. The limbs of the lizard are short, which is where the name of the animal comes from. Often, it retracts its limbs to the body and moves like a snake. The eyelids are fused together, with a transparent membrane. The colour of the back is brownish and, in some individuals, there is a greenish or reddish tinge. Most individuals have two or four dark, dashed lines on the backside. The abdomen's coloration is whitish-grey, with some of the individuals having an orange tinge. On both sides of the body, two dark-brown, broad lines run along, starting from the nose hole and passing through the whole body. Below these lines, a second such line can be seen on the head, passing through the supralabials and the under-eye scute.

In Europe, it is spread in the central and eastern parts of the Balkan Peninsula, to the Carpathians to the north and, sporadically, in the Pannonian Plain. To the south, it reaches the southern borders of the peninsula and a number of Ionian and Aegean islands. It is also found in Central and Western Asia Minor. In Bulgaria, the European copper is relatively rare in the Danube and Thracian Plains. In Northern Bulgaria, it is preserved in relict fragmented populations in small preserved oak forests or their outskirts. It is absent in the low plains and deforested terrains as well as in large areas in the southwest parts of the country.

A terrestrial and day-active species. It inhabits mostly sparse oak and oak-hornbeam forests and the grassy meadows along them in the low and middle mountain regions of the country. In danger, it hides in the foliage and grass. Earliest activity is observed in mid-February at a daily temperature of about 12° C. It is most active in spring, during the breeding season;

during the summer months, its activity is bimodal and drops significantly. The lizard feeds mainly on small insects but there are also arachnids in its food and, sometimes, even myriads. From the little research so far, it is noteworthy that cicadas are the predominant insects. It lays 2-5 eggs, most often four. The hatched youngsters have reddish tails and in the coming weeks their brightness intensifies.

Threats are fires and deforestation leading to drought of the micro-habitats, particularly in karst terrains, where the species is mainly found. The European copper skink is included in Annex III of the BDA, Annex IV to Directive 92/43 EEC, and Annex II of the Berne Convention. It is also included in the IUCN Red List as LC (least concern).

Lacerta agilis Linnaeus, 1758 - **Sand lizard**

A medium-sized lizard (the body reaches 8 to 9 cm.). There are two subspecies in Bulgaria: *L. a. bosnica* and *L. a. chersonensis*. The intensity and coloration in the males is seasonally changed: in early spring, when they wake up from hibernation, brown tones predominate in their coloration, and, as spring progresses, they get grassy-green coloured, and in *L. a. bosnica* it is only on the sides. In summer and autumn, the green tones are sharply decreasing at the expense of brown. The females are brownish. The central back (occipital) line in the subspecies *L. a. bosnica* is more often continuous or slightly broken; the eyebrow (supraciliary) lines are cut into separate spots; the eyebrow (supraciliary) bands are brighter; the upper side of the head (pileus) and the back are brown throughout the year. The abdomen is pale green, sometimes with a yellowish tinge, with many little black spots. In the females, the abdomen coloration varies from yellow to beige-creamy, with or without very few little black spots.

The species is widespread in Europe (to the south, to the Pyrenees, the Alps, the mountains in the southern and middle parts of the Balkan Peninsula, the Black Sea, the Caucasus, the northwest Asia Minor; to the north, to Britain and the southern parts of the Scandinavian Peninsula). In Asia, it reaches the Lake Baikal to the east. *L. a. bosnica* is found only in the mountainous regions of the Balkan Peninsula. The spread of the species in Bulgaria is highly fragmented and the subspecies *L. a. bosnica* inhabits the mountainous areas in West, Central, South-Western, and Southern Bulgaria between 850 m and 2,800 m above sea level.

The species is daily active and characterized by markedly bimodal activity: during the summer season (hot afternoon and afternoon hours), it is not active. As hides, it usually uses holes of rodents or ones that it digs itself, often with two outlets. It feeds mostly on beetles and, often, with other invertebrates such as spiders. The fertilization, depending on the altitude and the specifics of the year, is from the end of April to the middle of June. The eggs are laid from the beginning of June until the middle of August. The number of eggs varies between 4 and 12 (most often 6-8) and depends on the size, age, and current status of the females, with the larger females generally laying more eggs. The incubation period is about 55-65 days. The youngsters hatched have a total length of about 30 mm and in *L. a. bosnica* they may have a length of up to 58 mm when hatched. The sand lizard is also the most high-occurring egg-laying reptile in Bulgaria.

In some places in the country, isolated populations of the species are threatened by the destruction of their habitats due to the expansion of settlements and industrial zones, road

construction, etc. The species is included in Annex IV of Directive 92/43 EEC and Annex II of the Berne Convention.

Zootoca vivipara (Lichtenstein, 1823) - **Viviparous lizard**

The total body length (tail incl.) reaches 15 to 16 cm and the females are larger than the males. The back is brown in both sexes, with clearly visible longitudinal lines and stripes. The central dorsal (occipital) line is narrow and, more frequently, continuous, and there may be yellowish spots on both sides. On the side of it, the parietal stripes are with or without small black spots. The abdomen in the males is yellow to orange, with a lot of small black spots; in the females, it is pale yellow, beige or pale orange, without (or with very few) spots. The throat is white in both sexes. The newborns are dark brown or bronze-brown, with a clear metallic hue (to almost black), with vague elements of the pattern.

The Viviparous lizard is the species with the widest range of all the amphibians and reptiles found in Bulgaria. It stretches from the Cantabrian Mountains and Ireland to the west to the Sakhalin and Hokkaido Islands to the east, the Arctic Ocean and Barents Sea to the north, and the northern parts of the Apennine Peninsula and the central parts of the Balkan Peninsula to the south. The populations living in Bulgaria can be assigned conditionally to the nominate subspecies (*Z. vivipara vivipara*), spread mainly in Northwest Europe and partly in Central Europe, penetrating the mountainous regions of the Balkan Peninsula. In Bulgaria, it has been identified only in the high mountains: Rila, Pirin, Western and Central Stara Planina, Western Rhodopes, Vitosha, and Osogovo. It has been found from 1,200 to 2,900 m above sea level.

A terrestrial species, which in danger hides in the vegetation, often looking for salvation in the water (rarely climbs up to a meter of height on low trees and shrubs). It is active from late April to early October. During the summer heat, some populations inhabiting drier areas migrate to places near ponds or enter the woods. Depending to the altitude, it is active from the end of March to April (1,500-1,800 m above sea level), April (1,800-2,000 m above sea level) or early May (over 2,000 m above sea level). It feeds on small invertebrates such as ants, small beetles, and caterpillars. Flies, spiders, hayworms, cicadas and others are present in the food, too. In July or August, the females give birth to 2 to 12 youngsters but, most often, about 6; they are very small, with a total length of about 2 cm.

Many of the areas inhabited by the viviparous lizard are included in national parks and reserves. The species is protected by Annex III to the BDA and the Berne Convention. It is also included in the IUCN Red List as LC (least concern).

Zamenis longissimus (Laurenti, 1768) - **Aesculapian snake**

The Aesculapian snake is a medium to large snake species, which, in the other parts of its range, can reach dimensions of over 2 m but, in our country, the maximum measured length of the animal is 180 cm. The body is thinner than in other species reaching such dimensions but strong and muscular. The head is long and narrow, very poorly differentiated from the body. The back scales are smooth and shiny. Typically, the male individuals become larger than the female ones. The main dorsal coloration of the species is extremely varied: brownish, olive-green, graphite grey to almost black, etc. A typical element of the coloration is the

numerous light strokes on the back scales and, in some individuals, they may be less distinct. The upper part of the head is coloured like the back side and, in the occipital area, there is often a light (pale yellow to whitish) spot on each side. A dark stripe passes from the nose holes, through the eye, and to the back of the mouth and, often, a vertical dark line descends from the lower edge of the eye to the upper lip. The abdomen is most often single-coloured in whitish to light yellow. Partial as well as full melanists occur. The coloration of the young animals differs from that of the adults, with a very clear yellow spot on the ears.

The species is found from the north-eastern parts of the Pyrenean peninsula and the southern parts of Western Europe, through Central Europe to the Carpathians and isolated habitats east of them, to the central parts of the Apennine and the southern parts of the Balkan Peninsula to the south. It is also found in the northern parts of Asia Minor and in the Caucasus region. In Bulgaria, the species is widespread, most often in the zone up to 1,500-1,600 m above sea level.

The Aesculapian snake has a preference for wet deciduous, respectively mixed, forests and is particularly common in their enlightened sparse areas. It also inhabits meadows as well as shrub-rich areas. It does not avoid settlements and can often be found in different gardens, vineyards, farmland and farm buildings, etc. The species is markedly daily active. The mating season lasts from May to the second half of June. The animals are extremely good climbers and the copulation can take place both on the ground and in the branches of the trees. From the end of June until the end of July, 2-10 but, most often, 4-8 eggs are deposited. The females lay most often under the roots of trees, fallen trunks or holes in the trees where there is the moisture and temperature required for their development. The youngsters hatch from the end of August to the end of September. The overwintering period lasts from the end of October to the end of March-mid-April. The species is an excellent climber and often hunts birds in the trees. It feeds mainly on rodents, shrews, birds and their eggs and, in rare cases, lizards. In danger, the Aesculapian snake assumes a defensive position and defends itself by biting.

There are several major threats to the Aesculapian snake: direct killing by people for fear and ignorance, illegal clearing of deciduous forests, fires and, in certain places, road traffic. The species is included in Annex II of the BDA, Annex IV of Directive 92/43 EEC, and Annex II of the Berne Convention.

Coronella austriaca Laurenti, 1768 - **Smooth snake**

A small to medium-sized snake reaching up to 80 cm in Bulgaria. The head is elongated, oval, and poorly differentiated from the body. The tail is relatively short. The back side is quite variable in colouring and may be grey, greyish-brown or rusty-red. There are two longitudinal rows of dark spots on the background, which can often be merged into strips. On the side, there are darker irregularly scattered dots and streaks. The head is covered with large scutes and the body scales are smooth and brilliant. The abdomen may be grey, reddish, brownish, yellowish or almost black, with dark spots, and clearly iridescent. The females are larger than the males and have relatively shorter tails.

The species is widespread in Europe: to the southern parts of the Scandinavian Peninsula to the north, the central southern parts of the Pyrenean Peninsula and the southern parts of the

Apennine and Balkan Peninsula to the south, and the Ural Mountains to the east. It is also found in the northern parts of Asia Minor and in the region of Caucasus and Elbrus. It occurs in almost all parts of our country: in many places, with highly dispersed single habitats. It is absent in large parts of the lowland territories of Bulgaria having intensive agricultural activity. The vertical spread extends from the sea shore to 1,600 m above sea level and, in some exceptions, even higher.

The Smooth snake is a daily active species. The mating season takes place in different regions from late April to early June. At the end of summer and in early autumn, the females give birth to 4-8 (exceptionally, up to 15) youngsters. Sometimes, there is a late, second mating in August or early September. Sexual maturity occurs in the fourth year. Annual activity lasts from March to April until mid-late October. The food consists mainly of lizards: in places, mainly slowworms, but they also hunt for snakes (cannibalism), small mammals, and birds. In many areas, the species inhabits the same habitats with the viper and, due to their close size, the two species are often mistaken.

Possible threats to the species can be the destruction of the habitats (felling), fires, and direct killing for fear by humans. The species is included in Annex III of the BDA, Annex IV of Directive 92/43 EEC, and Annex II of the Berne Convention.

Vipera ammodytes (Linnaeus, 1758) - **Horned viper**

The total body length in our country reaches 83 to 87 cm. The newborns are 15 to 23 cm in length and look like the adults. The head is triangular, clearly differentiated from the body, covered with scales similar to those on the back. At the top of the muzzle, there is a small horn covered with scales (sometimes, due to an injury of the animal, it may be missing). The upper side of the body is light-grey or grey-brown, with a dark zigzag stripe. The stripe is usually continuous, in rare cases broken into individual spots. The males have a more contrasting coloration, the upper side of their body is more often greyish, and, at the edges of their zigzag stripe, they have a black border, especially at the convex corners. In the females, the contrast is absent or slightly visible and the main tone of the body is brownish to reddish-brown. The abdomen is grey with a creamy hue, with dark spots. There are two subspecies in Bulgaria. In the nominate subspecies *V. a. ammodytes*, the underside of the end of the tail is reddish or pale orange, and in the subspecies *V. a. montandoni*, the underside of the end of the tail is green or yellow-greenish.

The range of the species extends from the eastern slopes of the Alps, throughout the Balkan Peninsula, the Southwest Carpathians, the Ionian and Aegean islands, and the North Asia Minor, to the Transcaucasian region. In our country, it is found everywhere, with the nominate subspecies inhabiting North-Western Bulgaria and the northern regions of the Krayshteto, with *V. a. montandoni* inhabiting the rest of the country.

A daily species; in summer heat, it is sometimes active at night, too. It feeds on mouse-like rodents and other small mammals, lizards (including slowworms), rarely snakes, ground-nesting birds and their youngsters; cases of cannibalism are also known. Young individuals sometimes feed on Scolopendra. Most often, it hunts on the surface and, less frequently, in rodent holes. The copulation is in May-June. The youngsters (4-12, and up to 20 reported for other countries) are born from the beginning of July to the middle of October but, most often, in the second half of August and the beginning of September. Horned vipers usually

overwinter together in big numbers, rarely singly or in small groups. The horned viper is a poisonous snake but its bite can very rarely lead to death. However, in case of a snake bite, it is necessary to quickly go to a hospital to be injected venom antiserum.

The major threats to the horned viper appear to be its direct killing by humans (caused by the traditional fear of snakes), the collection of snakes by terrarium hobbyists, and fires. The species is included in Annex IV of the BDA, Annex IV to Directive 92/43 EEC, and Annex II of the Berne Convention.

Vipera berus (Linnaeus, 1758) - **Common European adder**

In Bulgaria, the species reaches dimensions of up to 80 cm. The males are usually slightly smaller and have a more contrasting coloration. The coloration and patterns in the young animals are similar to those of the adult animals. The body is relatively short and stouter than that of the Colubridae representatives, and the tail, compared to the overall size, is also quite short. The head is oval-elongated, with a triangular shape but not as distinct and differentiated from the body as in the horned viper. The scaling of the front part of the head usually consists of well-shaped scutes, frontal, parietal, and others. A dark zigzag pattern with sharp borders, which may have 50 to 95 curves along its length, passes over the basic background colour of the back. The head has a characteristic dark V- or X-shaped pattern. The abdomen is grey-brown, grey or black, with numerous small light spots. The neck is orange-tinted, with a number of lighter and darker spots in the females and, most often, dark to black in the males. The background colour of the body (the back side) in the females is brownish to reddish-brown; in the males, it is predominantly in the grey range and, during the breeding season, it can become almost silver-white. Often, the so-called melanists occur, i.e. totally or almost totally black animals, and they are observed in all parts of the vast range of the species.

The species has an enormous range from Western Europe and Britain to the Sakhalin and Hokkaido Islands in the Pacific: all Palaearctic; to the north, especially in Europe, its spread coincides with the continent's borders; to the south, it inhabits the extremely high parts of the mountains and reaches the Alps and the central parts of the Balkan Peninsula; to the east, its southern border is the forest-steppe zone. The subspecies *V. b. bosniensis* occurs mainly in the mountains of the Balkan Peninsula as well as in a small number of isolated habitats in the southern part of the Pannonian Plain. In Bulgaria, the common European adder inhabits predominantly the middle and high-mountain massifs and reaches altitudes of 2,700 m above sea level, below the Musala peak.

The common European adder is a predominantly daily active species. The activity during the year depends on the location of the habitats and the climatic conditions of the specific year: from April to the third decade of October. The first to leave the winter lairs are the males and, 1-2 weeks later, the females and the young ones. The reproduction in Bulgaria is not well researched but mating usually takes place between May and June. The young are born fully developed, in transparent membranes - usually from the second part of August to the end of September. The females give birth to 4-8 youngsters (rarely 12). The overwintering occurs in holes and slits under the ground, in stone piles and clusters, at the base of rhizomes, etc. Depending on the specifics of the terrain, the animals can overwinter separately or in smaller or larger groups of up to 300-800 individuals. The food of the species consists of lizards, frogs, small mammals, and, rarely, small birds.

As with the horned viper, the major threats to the common European adder are its direct killing by humans (caused by the traditional fear of snakes), the collection of snakes by terrarium hobbyists, and fires. The species is included in Appendix III of the Bern Convention.



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