

**On the Herpetofauna of the eastern Adriatic coastal
region
[Kvarner area, Dalmatia (Croatia) and Montenegro]**

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This report deals with the relatively small area along the eastern Adriatic coast from Rijeka in the north, including the Kvarner islands Krk, Rab and Pag along the western slopes of the Kapela and Velebit mountains, the Zadar chalk flatlands east to the Dinarian Alps and along these mountain chain south to the bay of Kotor. There we leave Croatia and enter Montenegro. This country also has a very narrow coastal belt, but in the south the large Skadarsko lake area is included.

With exceptions of the Zadar chalk plain, the Neretva delta and the Skadarsko area, the coastal belt has a width of only a few hundred meters to 10 kilometres. Around Zadar the coastal area is about 40 kilometres wide. The Neretva delta expands about 20 kilometres land inside. The Skadarsko lake area also is about 40 kilometres broad, separated from the sea by the Sutorman and Rumija mountains.

The distance from the northern most point (Rijeka) to the southern most (island Ada) is 560 kilometres bee line. So there is a big change in climatic conditions.

In and around the Kvarner bay with the islands Krk and Rab, freezing is not rare in winter time with low temperatures down to -7°C for some days.

Around Zadar, also freezing with temperatures down to -7°C is restricted to a few nights. More south freezing is

rare in the coastal area but possible in the hills and normal at higher elevations.

Around Ulcinj in southwestern most Montenegro little freezing seldom may occur every few years.

Rain (or snow) is falling mostly during autumn and winter month and normally stops at the middle or end of April and start again in the middle or end of September. Due to the high mountains just behind the coast-line, the highest amounts of rainfall are known from the cities Split (Croatia) and Kotor (Montenegro).

Average yearly mean temperatures change from 14,5°C (Rijeka) to 17,8°C (Dubrovnik) and 20,2°C in Podgorica near lake Skadar.

The sunshine hours – this year from January 1st to September 30th are 2.153 for Rijeka and 2.625 for Dubrovnik.

The whole area mostly is high carstic, mainly overgrown with bushes. Forests are along the coast south of Zadar, especially between the coast and lake Vrana, along the Krka and Neretva river and at higher altitudes.

In the southern most area, dealt here, the Skadarsko area, the coastal is very sandy. But the hills and mountains, as well as the surroundings of the lake are carstic again.

Therefore it is not astonishing that there is a wide range in the distribution of Amphibians and Reptiles. Some occur in the whole area, some may be found just in the north or south and some are restricted to special habitats and/or climatic conditions.

Beginning from the north to the south different habitats and their herpetofauna will be shown.

The first point of interest is the Kvarner island Krk. This island, about 400 km² large mostly belongs to the eumediterranean climate. Heavy rainfalls during autumn,

winter and early spring is normal, also snowfall down to the shore. There is regular freezing, about 20 nights and 5 to 6 days every year. The summers are dry and warm, but not hot. Because nearly every day wind is blowing and mostly keeps the temperature below 30°C.

Islands vegetation consists mostly of Macchia. In the eastern and southern parts Macchia changes to Phrygana, due to the wind, coming down from the nearby mountains. There are also a few dense forests on the island.

Herpetofauna found on Krk is: *Lissotriton vulgaris*, *Rana ridibunda*, *Hyla arborea*, *Bufo bufo* and *B. viridis* in amphibians and *Testudo h. hercegovinensis*, *Emys orbicularis*, *Podarcis melisellensis*, *P. sicula*, *Lacerta trilineata*, *Algyroides nigropunctatus*, *Anguis fragilis*, *Pseudopus apodus*, *Hierophis gemonensis*, *H. viridiflavus*, *Elaphe quatuorlineata*, *Zamenis longissimus*, *Z. situla*, *Natrix natrix*, *Telescopus fallax* and *Vipera ammodytes* in reptiles. All are shown with pics of typical habitat.

The next island, we will have a look at, is the island Pag, the most southern of the Kvarner islands.

Due to the Velebit just opposite the Velebit channel, Pag is very influenced by the “Bora”. Therefore, especially the eastern regions and the south is nearly without vegetation. Macchia is rare on the island and “forests” only grow at the western slopes of the “Lun”-peninsula. Pag is the island of stone-walls, separating the pastures, about 80% of the vegetation.

Also the herpetofauna is very different from this on island Krk. There are no newts. The only Amphibians known are *Hyla arborea*, *Bufo viridis* and *Rana*

ridibunda. *Bufo bufo* has been found by us only in two individuals and these are the first records from the island. While *Testudo hermanni hercegovinensis* is rare on Krk, here it is quite common, also *Emys orbicularis*. Lizards found, are mostly *Podarcis sicula*. *Podarcis melisellensis* and *Lacerta trilineata* show a strong decline within the last years. *Pseudopus apodus* is very common and maybe the most abundant reptile on Pag. Many snakes species, like *Telescopus fallax*, *Natrix natrix*, *Zamenis situla*, *Vipera ammodytes* are rare, but *Hierophis gemonensis* and *Malpolon monspessulanus* may be found everywhere. *Elaphe quatuorlineata* and *Zamenis longissimus* have been found only in single specimens.

Going more south, we will observe the herps south of Zadar. Within a few square kilometres vegetation changes from pine-forest to Macchia and Phrygana to swampy areas. Therefore nearly all members of the herpetofauna, living in northern Dalmatija, may be found within a few minutes. Many of them will be shown and also a glimpse of the different habitats is given.

After having a short view to the Krka-waterfalls, our next stop will be in the Biokovo mountains and the Bacina-lakes close to the Neretva delta.

In Biokovo and the Mosor mountain, *Archeolacerta mosorensis* has its northwestern most distribution areal.

Around the Bacina lakes *Lacerta oxycephala* is very common. Here and in the delta as well as in the hills beside, both *Natrix* species, *Podarcis melisellensis*, *Lacerta trilineata*, *Elaphe quatuorlineata*, *Zamenis situla*, *Hierophis gemonensis*, *Vipera ammodytes* and other herps are living.

Along the city-wall of Dubrovnik you may find *Lacerta oxycephala* in high numbers.

The natural distribution of *Podarcis sicula* stops at the northern parts of the Neretva delta. Here in Dubrovnik and only here within the city, an introduced population of this species exists. Former known as subspecies *Podarcis sicula ragusae*. Today we know, these lizards have been introduced during the Venecian period from southeastern Italy and belong to the widely distributed subspecies *campestris*.

In Kotor, a very nice town in the bay of the same name, there is also an introduced population of *Podarcis sicula*, former known as *Podarcis sicula cattaroi*. These *Podarcis* are a mixture of individuals introduced from Dubrovnik (Ragusa) at one hand and from eastern Italy.

At least we will visit the coastal area in southern Montenegro – Sutorman, Rumija mountains and the island Ada and its surroundings.

While these mountains, named above show the same composition of herpetofauna like many parts of east Adriatic region, island Ada and its surroundings holds some different species. This depends on the different climate of this area. Ada and the nearby hinterland mostly has sandy soils, keeping the moisture very good. Therefore dense forests are growing. So here you will find species, only found far land inside or more north again or have their northern limits here. Examples are *Dolichophis caspius*, *Typhlops vermicularis* and an unequal population of *Zamenis longissimus*. Also a separated population of *Lacerta viridis* is found here.

Anguis fragilis from these areas show typical characters of the nominate race and the subspecies *colchicus*. So it looks like, *colchicus* is only a morph and no subspecies at all. So this area is rich on swamps, ponds and ditches,

huge populations of *Natrix natrix* and *Natrix tessellata* are living here.

The second one is also found in high numbers in and around lake Skadar, while *Natrix natrix* is not so common here.

In coastal Montenegro, including the lake area, *Podarcis muralis* is found at very low elevation, only a few meters above sea level. At this latitude, the Wall Lizard prefers higher elevations but may live here due to the moderate climate.

In this lecture, beside all the herps and their habitats, pictures of some cultural interesting spots, like Trogir, Dubrovnik and Kotor will be shown also. Therefore a trip to the east Adriatic coastal area may be not a herpetological trip alone.