

The Zemplín Mountains Region from the perspective of geology and tourism

The gift of five rivers – Tisa, Bodrog, Latorica, Tice and Krčava – that is Medzibodrožie. The land between the rivers. Medzibodrožie is a real island surrounded by rivers and connected to the outside world by only a few bridges. An island of silence with the croaking of frogs and the singing of birds. A region with a strong identity and character.

You can sail on the river, cycle along the dam and watch the shepherd watering the cattle from the swinging well, sit by the dead branches and watch the herons, swim in the still clean water full of fish, taste excellent Tokaj wine in ancient tuff cellars, enjoy halászlé made from fresh fish, admire romantic castles, manor houses and churches, learn to ride a horse. And then there is the Zemplín Mountains, rising like a spire above the surrounding terrain of the Eastern Slovak Lowland with the highest elevation Rozhlětná (469 m).

The region is part of the upper Tisa (Bodrog) basin and is drained by many streams flowing into the Black Sea. The most important and longest river is the Latorica, which after its confluence with the Ondava forms the Bodrog River with the lowest point in Slovakia near the village of Klin nad Bodrogom, 94.3 m above sea level, where it crosses the state border into Hungary.

During the long geological development from the Paleozoic era (approx. 542 million years ago) to the present, geological processes have shaped the landscape into a multifaceted form. From a geological point of view, the uniqueness of the area lies in its interface between the Western and Eastern Carpathians, where rocks from the Paleozoic era to the present are preserved on the surface.

The region is formed by the Tertiary East Slovak Basin with a partial Trebišov Basin and the Roňava Gulf, an inseparable part of which are buried stratovolcanoes and volcanoes, which occasionally emerge to the surface. Pre-Tertiary formations in the area are part of three Alpine-formed tectonic units, with only one of them – the Zemplínium emerging to the surface and forming the Zemplín Hills. The other two units – the Ptruškian (or Kričevská) and the Iňačov (Pozdišovsko-Iňačovská) units were discovered by drilling in the bedrock of the Tertiary and Quaternary fill of the East Slovak Lowland. All of the above units are a reflection of the resulting tectonic and metamorphic phases of Alpine orogeny, although their structure also includes rocks of the Upper Paleozoic (Paleozoic) as well as metamorphic formations and volcanic-sedimentary complexes representing older stages of orogeny (Varician and Pre-Varician).

The Ptruškia tectonic unit in the basement of Tertiary rocks is formed by Paleozoic to Mesozoic metamorphic shales, sandstones with layers of acidic volcanoclastics, limestones and shale limestones with isolated layers of basic volcanics.

The Iňačov tectonic unit is built by Paleozoic, Mesozoic to Tertiary, more or less metamorphic sedimentary formations and volcanic complexes reaching a thickness of several hundred meters. The boundary of the Iňačov unit versus the Ptruškian unit is at the fault near Čičarovci, where the contact is at the supply system of the Bešian and Malčice neovolcanites.

The Zemplínium is the southernmost tectonic unit in the region, which also emerges to the surface. It is composed of a crystalline foundation and an Upper Paleozoic and Mesozoic shell. The Upper Paleozoic sediments and complexes are represented by unmetamorphosed Paleozoic rocks of the Upper Carboniferous and Permian and Mesozoic carbonates. The Zemplínium became part of the block of the inner Western Carpathians only in the youngest Neogene stages of tectonic development. The basement of the Upper Paleozoic and Mesozoic

formations at depth is formed by the Byštian complex (Old Mountains) of the Upper Proterozoic (?) to Lower Carboniferous (?) age, which is formed by metamorphic rocks (gneisses, amphibolites, migmatites).

In the area of the southern part of the East Slovak Basin - the wider area of the Zemplín Mountains and the southern part of the East Slovak Basin itself - products of areal acid (acidic) volcanism and products of areal bimodal (andesite - rhyolite) type volcanism with a predominance of acid pyroclastic type occur. A large part of the products of these types emerges on the present surface and took place in the period of the Lower to Upper Baden, or upper Baden to lower Pannonia. The dominantly represented volcanism of the bimodal andesite-rhyolite type took place here in a terrestrial and a substantial part in a shallow marine environment. It is represented in the form of lava complexes of andesites, but above all a very wide range of extrusive bodies of pyroclastic pumice-tuff, lithoclastic-tuff and tuff horizons with rhyodacite and rhyolite composition.

Products of andesite volcanism of the stratovolcano type from the Baden period (the Zatín and Krávik-Chlmecké buried volcanic complexes) and the lower Sarmatian (volcanic complex of Beša – Vojany and Malčice) extend into the eastern and northeastern part of the shown area. These products are mostly buried under younger sediments and range in depth from roughly 100 to 500 m to 3.5 to 4 km below the current surface. They have been verified by deep oil exploration wells and their spatial extent is interpreted using geophysical methods. Pyroclastic ash tuffs of the first type of volcanism with rhyodacite composition were found to a lesser extent in the area of Byšta and Veľká Trňa and do not come to the surface.

The beauty of nature in the Zemplín Hills and in the lowlands with many nooks and crannies will captivate every attentive admirer of this exceptional corner of Slovakia.

From the period 2,500 years ago p. n. l. floodplain forests, accompanying communities of water bodies and heat-loving scrub, lowland forests and sparse forest-steppe forests on loess clays have been preserved until now.

The great variety of nature and landscape, but above all the large number of rare and unique plant and animal species of Medzibodrožia and parts of Dolné Zemplín led to the establishment of several large- and small-area protected areas. The large Protected Landscape Area (PLA) of Latorica is located here.

The territory of southern Zemplín and Medzibodrožia was inhabited already in the older and younger stone ages. This is documented by archaeological finds of stone tools.

In the south-eastern tip of Slovakia lies the Vinohradníčka oblasť Tokaj. The beginnings of vine cultivation in this area are known from the period of Roman rule. The Tokaj region is one of the few regions in the world where it is possible to grow grapes for the production of naturally sweet wine. The long sunny autumn allows the ripening berries to be attacked by the noble fungus *Borytris cinerea*, which dries the berries. They will remain cibeby (raisins), without which it would not be possible to make quality Tokaj pilgrimage wine. Grape varieties such as Furmint, Lipovina and Yellow Muscat have been grown for centuries for the production of Tokaj wines, which must be used in a specified proportion. The original technological process of Tokaj wine production and maturation is also very important.