Polish Geological Institute Special Papers, 2: 87–90 (1999)

Selected geosites of the Roztochya Hills and the Lublin–Lviv Upland (Volyn Upland)

Andriy IVCHENKO*, Zhanna MATVIISHINA*

A b s t r a c t. The Roztochya Hills and Lublin-Lviv Upland (Volyn Upland) are the north-western spurs of the Volyn-Podil Upland. They consist of the Cretaceous, Neogene and Quaternary deposits. 39 geosites are registered here, 14 of them having the geoprotection status. In these regions more than 60% of the geosites are referred to geomorphological type of geosites. In the paper, 4 objects of geological heritage of Roztochya Hills and the Lublin–Lviv Upland (Volyn Upland) have been proposed for the draft candidate list of geosites of Central Europe.

Key words: geoconservation, European network of geosites, Roztochya Hills, Lublin–Lviv Upland, Ukraine.

Andriy Ivchenko, Zhanna Matviishina (1999) — **Wybrane geostanowiska Roztocza i Wyżyny Lubelsko-Lwowskiej (Wyżyna Wołyńska)**. *Polish Geological Institute Special Papers,* 2:87–90.

S t r e s z c z e n i e. Roztocze i Wyżyna Lubelsko-Lwowska (Wyżyna Wołyńska) są północno-zachodnimi fragmentami Wyżyny Wołyńsko-Podolskiej. Zbudowane są z utworów kredowych, neogeńskich i czwartorzędowych. Zarejestrowano tu 39 geostanowisk, z czego 14 ma status geoochrony. Ponad 60% geostanowisk należy do kategorii geomorfologicznej. W niniejszeym artykule 4 stanowiska dziedzictwa geologicznego, Roztocza i Wyżyny Lubelsko-Lwowskiej, proponuje się umieścić na wstępnej liście geostanowisk Europy Środkowej.

Słowa kluczowe: geoochrona, europejska sieć geostanowisk, Roztocze, Wyżyna Lubelsko-Lwowska, Ukraina.

Contrary to the Ukrainian Carpathians, a number of geosites in the territory of Roztochya and the Ukrainian part of the Lublin-Lviv Upland (Volyn Upland) is much lower. 39 geosites, 14 of which having obtained the geoprotection status as sites of geological heritage of Ukraine, are recognized in this area. Five more geosites are the components of hydrological, landscape and complex nature protection territories. And finally, the most numerous group consisting of 20 geosites is refered to the objects claiming to obtain the geoprotection status as geological sites. In this region, the overwhelming majority of geosites (about 60%) are referred to the geomorphological type of the geological heritage site classification of Ukraine.

Roztochya is a wavy spur situated in the Western Ukraine and in the south-east of Poland. Within Ukraine, it stretches from Lviv to Rava Rus'ka over a distance of 60 km being 10–30 km wide. Absolute heights are 240–379 m a.s.l., comprising an average of 320–370 m a.s.l. The Bulava, Seredny Kholm and Dilova hills represent the highest points there. Geostructurally, Roztochya is connected with the Rava Rus'ka zone and partially with the Lviv Palaeozoic flexure. It consists of the Cretaceous and Neogene deposits, i.e. marls, sands, limestone sands and limestones. Irregular denudation of Roztochya was the reason of a step character of relief with the average height of a step being nearly 15 m. The surface is greately dissected by river valleys and by ravines 50–100 m deep. The Zakhidny Buh, Dniester and San rivers originate in Roztochya.

The Ukrainian part of the Lublin-Lviv Upland (Volyn Upland) is situated within the Lviv, Rivne, and partially Khmelnytsky regions of Ukraine (Fig. 1). Geostructurally, the Upland is connected with the Volyn-Podil monocline and with the western slopes of the Ukrainian Shield. It is notable for widely spread loesses, for elevated Cretaceous rocks and for a surface dissection by asymmetrical wide valleys of the Zakhidny Buh, Styr, Ikva and Horyn' rivers.

1. The Lev Hill in the central part of the Lviv city, south-eastern part of Roztochya (365 m a.s.l.; 49°53'12"N/ 24°01'37"E).

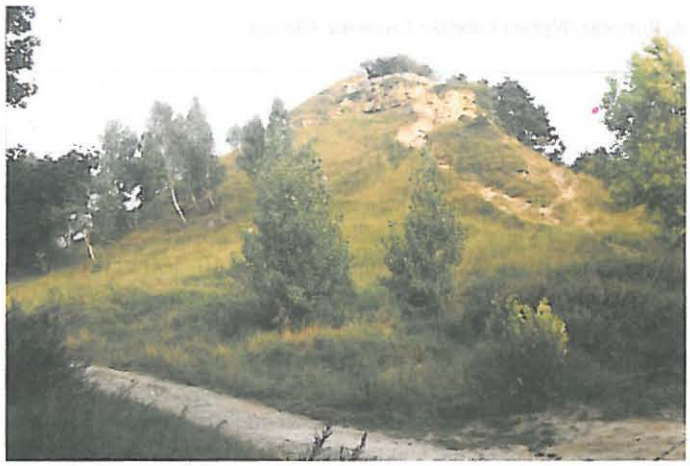
Main features: Upper Cretaceous marls, Upper Tortonian deposits rich in fossils, structural terrace.

The Lev Hill is a detached conic height known also as the Pishchana or Lysa Hill (Fig. 2). In its northern slope basement, outcrops of the Upper Cretaceous Lviv marls are found. They are overlaid by the Lower Tortonian deposits of the Neogene

*National Academy of Science, Institute of Geography, 44 Volodymyrska St., 252034 Kiev, Ukraine

Fig. 1. Distribution of geosites on the geological map of Roztochya and Ukrainian part of the Lublin–Lviv Upland (Volyn Upland)

Fig. 3. Tchortova Skala (Hill) — sandstones and breccia of Upper Tortonian



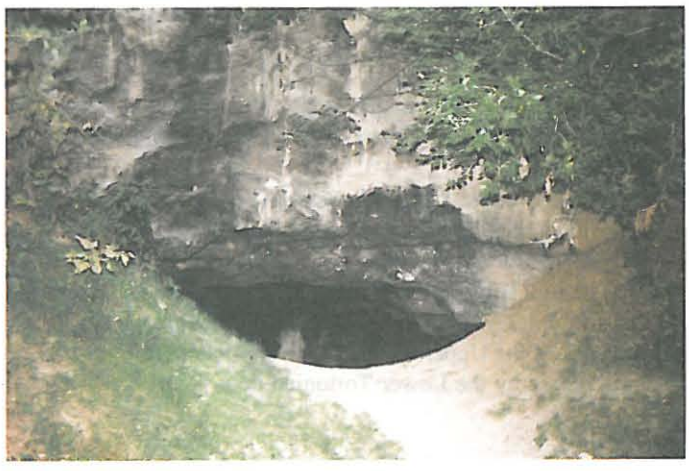


Fig. 2. The Lev Hill — outcrop of Upper Cretaceous and Upper Tortonian deposits abound in fossils. All photos by E. Timchenko

represented by sandstones of different density and granulometry with flint pebbles, lithothamnium swellings and pelecipoda shells; by the quartz fine-grained, oblique sands with fossilized trees; by sandy limestones with lithothamnium swellings and with interlayers filled with bivalvia shells (Danysh, 1987c). Sandy limestones form the well expressed structural terrace with juts of the Lev and Vysoky Zamok hills. Upward, the Upper Tortonion deposits are represented by quartz, by sandstones interlayered with benthonitic clays and dense sandy limestone with numerous lithothamnium swellings and bivalvia shells.

The locality has been protected since 1970 in the area of 0,2 ha.

2. Tchortova Skala (Hill) in the eastern suburb of the

Fig. 4. The entrance to the Medova Cave within Upper Tortonian limestones

Lviv city, in the south-eastern part of Roztochya (370 m a.s.l.; 49°53'42"N/24°02'23"E).

Main features: sequence of Upper Tortonian, rocky landscape.

In the eastern suburb of Lviv, a small ridge covered with beech-hornbeam forest is situated. A picturesque Tchortova Skala is found there (Fig. 3). Precipitous rock outcrops, more than 20 m high, characterized by fantastic cavernous forms of weathering, look like an original fortress. The Tchortova Skala forms an erosional remnant consisting of the Upper Tortonian (Neogene) stripped layered sandstones up to 30 m thick (Danysh, 1987b). In the lower part of the sequence, sandstones are rather massive while in its upper part, thin intercalation of dense quartz sandstones with their porous varieties is observed. In some places, thin layers are changed by breccia ones where debris of dense sandstones are found among more porous ones. This sequence is considered to be a key site of the Upper Tortonian deposits of Roztochya.

This geosite is proposed for protection, area to be protected is 2 ha.

3. The Socalsky Quaternary sequence in the quarry near the Boyanychi village, the western part of the Volyn Upland (270 m a.s.l.; 51°22'09"N/24°45'13"E).

Main features: type section of Pleistocene deposits, cryogenic form.

The key site of the Quaternary deposits of the western part of Ukraine consists of loess-soil deposits, redeposited moraine deposits of two glaciations of different age (Demedyuk, 1980). Up to 18 m high walls of the Socalsky quarry reveal the Lower, Middle and Upper Pleistocene deposits. In the Quaternary basement lying on the Upper Cretaceous sequences, a moraine is found. It is correlated with the Mindel (European stratigraphic scheme), Oka (Russian s.s.) and Tiligul (Ukrainian s.s) (Veklich (ed.), 1993). Upward, seven pedocomplexes subdivided by loess-like and sandy loam horizons have been fixed. Traces of cryogenic destructions (frost clifts and solifluction destructions) are also of great interest (Bohutsky & Demedyuk, 1972).

This sequence represents one of the most complete stratigraphic sequences of the Quaternary deposits of the Western Ukraine. Besides, presence of two different age horizons of the redeposited moraine loams makes it a unique one. The sequence is studied by a complex of methods including those of absolute dating and magnetic susceptibility that allows its correlation with the analogous sequences of the same age situated in the neighbouring countries (Nawrotski *et al.*, 1997).

This geosite is proposed for protection, area to be protected is 10 ha.

4. The Medova Cave in the eastern suburb of Lviv, southeastern part of Roztochya (365 m a.s.l.; 49°3'22"N/24°02'47"E).

Main features: cave, Upper Tortonian limestones.

The Medova Cave known since the 13th century is situated on the Ratyn Upland (its highest point is 387 m). It is called so due to beautiful accumulation of honey-yellow calcite that decorates its walls and ceiling. Nowadays, they can be seen in a few cavities only. The cave is situated in the Ratyn chemogenic limestones of the Torton layer of the Neogene. These limestones are grey and yellowish-grey, dense, pelitic and cavernous. The Lower Tortonian glauconite-quartz sands, sandstones, sandy loams and limestones with purple water-plants lie in their foot, while the Upper Tortonian clays, marls and sandstones with bentonite are found in its roof. The virgin sulphur deposits are connected with the Ratyn limestones of the pre-Carpathians (Danysh, 1987a).

The total length of the Medova Cave in the cavernous limestones comprises nearly 110 m. It consists of three chambers (large chamber with a column in its center is situated near the entrance) connected by galleries (Fig. 4).

Conclusion

Four referred geosites reflect some features of the geological histoty of the Roztochya Hills and the Lublin-Lviv Upland in Ukraine. The major part of these regions is in the Polish side.

References

BOHUTSKY A., DEMEDYUK M. 1972 — Pleistocenovuye otlozheniya. In: Priroda Lvovskoy oblasti, 20–26. Lviv.

DANYSH V. 1987a — Peshcera Medovaya. In: *Geologicheskije pamyatniki Ukrainy*, 88.

DANYSH V. 1987b — Chortova skala. In: *Geologicheskije pamyatniki Ukrainy*, 89–90.

DANYSH V. 1987c — Gora Lva. In: *Geologicheskije pamyatniki Ukrainy*, 90–91.

DEMEDYUK M. 1980 — Stratotipy i krajevye obrazovaniya materikovych oledenenij v zapadnoj ychasti Ukrainy. In: VI Vsesoyuznoje soveshchanie po izucheniyu krajevych obrazovanij materikovych oledenenij. Kiev: 20–21.

NAWROTSKI J., WOJCIK A., BOGUTSKI A. 1997 — The magnetic susceptibility record in the Polish and Western Ukrainian loess-palaeosol sequences conditioned by palaeoclimate. *Boreas*, 25: 161–169.

VEKLICH M. (ed.) 1993 — Stratigraphicheskaja schema chetvertichnych otlozhenij Ukrainy. Gosudarstvennyj Commitet po Geologii, 1–73.Kiev.