

GeoTerrace-2023-036**Kamianytsia quarry as a geological training ground for geography students*****M. Mykyta, M. Salyuk, *V.Chyniak, V. Leta, A. Zadorozhnyy** (*Uzhhorod National University*)**SUMMARY**

This paper describes the Kamianytsia quarry as an educational geological site for the practice of students of the Geography Department of Uzhhorod National University. The geological structure and minerals of the Kamianytsia quarry are characterized. The skills that students acquire when describing a given geological object are presented, as well as the technologies used during the field stage of geography students' practice. The following is a list of the main tasks that students perform during their internships. The typical stages of field work of the first-year students of the Department of Physical Geography and Environmental Management of the Faculty of Geography are outlined/

Keywords: Kamianytsia geological testing ground, training practice, practical skills

Introduction

Field practice plays an important role in the training of geographers of all specialties. It is during field research that students receive the necessary geological information. The ability to see and find traces in nature of the processes that students have learned about in the classroom does not appear immediately. This skill needs to be developed, because without such a vision, there can be no researcher, and thus no full-fledged geography specialist. During the field training practice, students can fully apply their theoretical knowledge to a real geological setting, acquire practical skills in field observations, and work in conditions close to industrial (production) ones (Oliinyk, Bubniak & Bihun, 2022). It is very important for students to know how to study and describe geological outcrops, i.e., rock outcrops on the surface. Therefore, the work primarily focuses on the description of outcrops and sampling on the example of the Kamianytsia andesite quarry in the Transcarpathia region.

Geological location of the Kamianytsia andesite landfill

Any internship consists of preparatory, field and desk stages. During the field stage, students consistently carry out reconnaissance routes, study reference sections, geological mapping of the area, educational and familiarization geological excursions, and current desk processing of field materials (Elkins et al, 2007).

One of such accessible geological sites for geographers of the Department of Physical Geography and Environmental Management is the Kamianytsia andesite quarry, located in the village of Kamianytsia, Uzhhorod district, Transcarpathia region (Fig. 1).

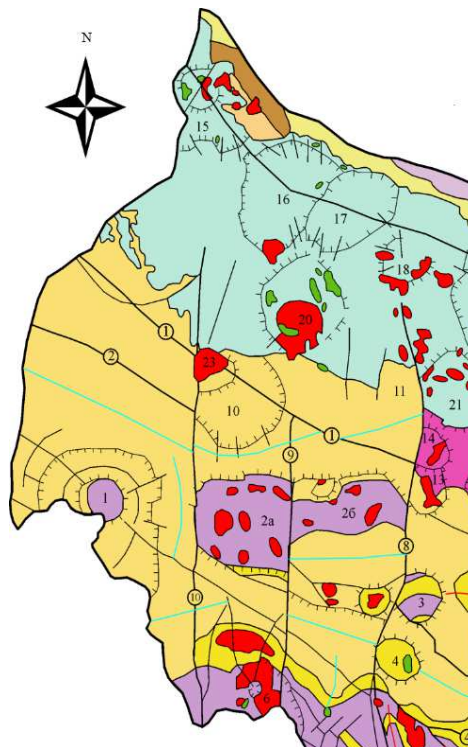


Figure 1 *Fragment of a tectonic map of the volcanic mountains of Transcarpathia (compiled by M. Mykyta on the basis of materials from the Transcarpathian geological exploration expedition) (Mykyta, 2010)*

Outcrops of igneous rocks in the Kamianytsia quarry form the Antalivskii volcanic complex of Dacian-Romanian volcanostructures (Mykyta, 2022) (Fig. 2). A complex is defined as a set of lava-proclastic formations that are spatially associated with a particular volcanic center or a group of them and correspond to the entire period of volcano formation or its stage (Matskiv, etc. 1996).



Figure 2 Outcrops of andesite-basalt in the Kamianytsia quarry

The Antalivsky volcanic complex is centered on Antalivska Polyana, which is a large stratovolcano. It is formed by andesites, andesite-dacites, rhyolites and their tuffs (Matskiv, etc. 1996). In addition to Antalivska, this complex fully forms the Poprychnyi volcanic structure on the southeastern slopes of which the Kamianytsia quarry is located.

With an angular unconformity, the rocks of the Antalivskii complex overlie Jurassic, Cretaceous and Paleogene sediments of the Peninsular zone and Magurskii cover, and with a stratigraphic break - terrigenous sediments of the Neogene: Tereblinska, Solotvynska, Teresvenska, Dorobrativska, Lukivska and Almashska formations and are partially overlapped by sediments of the upper part of the Ilnytska Formation (State geological map of Ukraine, 1991; Stratigraphic dictionary, 1985).

At the base of the complex there is a horizon of rhyodacites, their tuffs and tuffs with garnet up to 60 m thick (analogous to the Hážín tuffs of Slovakia). Above, there are andesite tuffs with low-powered lava flows (1-15 m). The thickness of the unit increases from the periphery (15 m) to the central part of the Poprychnyi volcanostructure (200-400 m). Above them lie fine porphyry andesites, which are widespread throughout the Poprychnyi area and in the lower part of the Antalivskiyi volcano section. Their maximum thickness is observed in the central parts of the structures and is 200-260 m. In addition to flows, they often form eruptive bodies, which are developed not only in the center of the volcanostructures, but also on the periphery (in the Kamianytsia quarry).

The outcrop section is represented by fine- and medium-porphyrific diproxene andesites and their tuffs. It should be noted that lavas and agglomerate tuffs predominate in the center of the structures in the section of the unit. The thickness of the unit here is 350-450 meters. Toward the periphery, the number of lava flows and their thickness decreases, coarse tuffs turn into lapilli gravels and psamites, tuffs appear, and the thickness of the pack reaches 100 m. The section of the complex is completed by lava flows of different porphyry andesites 70-200 m thick, which extend to the periphery of the structures.

The age of the rocks of the Antaliv complex is debatable. According to the "Stratigraphic scheme of Neogene deposits...", the rocks of the complex are attributed to the Dacian and Romanian Pliocene levels (Matskiv, etc. 1996).

At the same time, in the Slovak part of Vyhorlat, according to new data on determining the absolute age of rocks, their analogues are assigned to the Upper Badenian-Pontian, which is confirmed by their overlap with sedimentary rocks of the Sarmatian and Lower Panonian (Zec, 1997).

The Comprehensive Geographical Practice involves students of the Faculty of Geography performing various types of work in the following sections:

- geological and geomorphological;
- soil science;
- ecological;
- mountain;
- local history.

It is during the geological and geomorphological section of the educational practice that students have the opportunity to improve their theoretical knowledge and acquire new practical skills on the territory of the Kamianytsia andesite quarry, which serves as a geological training ground for first-year students majoring in 014 "Secondary Education. Geography" and 106 "Geography". This section of the practice involves:

- students acquire skills and abilities to perform field and desk work during geological research of the internship area;
- familiarization with the geological structure, relief, and manifestations of modern morphodynamic processes (karst, suphosition, landslides, linear erosion, planar erosion, etc.) of the internship area;
- familiarization with the methodology of geological and geomorphological mapping;
- analysis of geological and geomorphological data obtained in the field.

The students conduct reconnaissance routes on the territory of the Kamianytsia geological landfill. During the reconnaissance, they solve the following tasks:

- familiarization with the topography of the area, passability, nature of the outcrop and the main features of the geological structure of the training ground;
- mastering the methodology of conducting reconnaissance routes with a set of general stratigraphic, lithological and petrographic, structural and tectonic, geomorphological, hydrogeological observations;
- identifying the shape of the occurrence of igneous rocks (rods, dykes, veins) in the section, including marking horizons for their further detailed study and mapping; acquiring skills in field work with aerial photographs (orientation, georeferencing and mapping of observation points, outcrops and geological information, recognition of geological objects by direct and indirect features);
- testing students' knowledge of field geology and topography (reading a topographic map, keeping a field diary, working with a mining compass, selecting and documenting rocks and fossils, making field sketches and photographing geological objects, recording various geological objects) (Sivoronov et. al. 2012).

Conclusions

The use of the Kamianytsia andesite quarry during the field stage of the training practice helps to consolidate the theoretical knowledge gained by students in the study of the theoretical part of the disciplines, including General and Historical Geology during the first year of study, to familiarize themselves with the methodology of geographic mapping and to acquire practical skills in organizing and conducting field geographic research.

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