

Structure of the Pleistocene dammed lakes in the Kamienica River Valley in Gorce Mts. Magura Nappe, Outer Carpathians Poland: key study

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In Gorce Mts. a few traces of Pleistocene dammed lakes were found. The Gorges is a part of Beskidy Mts. Range, located north of the Tatra Mountains and Podhale region in western part of the Polish Outer Carpathians. Whole the massive presents characteristic morphology – para-radial arrangement of mountain ranges and valleys, radiating from the highest peak which is Turbacz Mt. (1310 m.a.s.l.). During detailed geological and geomorphological investigations in Gorce Mts. authors found a traces of Pleistocene and Holocene dammed lakes. The most spectacular lakes were found in source part of Kamienica River valley. Studied segment of the valley is located between Jaworzyna Kamienicka Range on south and Kudłoń Range on the north. Here on the distance of a few kilometers it has west-east extension.

The Gorges are formed on the area of the Magura Nappe, most inner tectonic unite of the Outer Carpathians. In the Gorges are represented two facial-tectonic subunits of the Magura Nappe. Its southern part is built of the Krynica Subunit and northern of the Bystrica Subunit. Source part of Kamienica River is located on the area of the Krynica Subunit. The Krynica Subunit is built of the Upper Cretaceous and Paleogene flysch deposits. In the studied area the Paleogene deposits are represented by the Zarzecze Formation and the Piwniczna Sandstone Member of the Magura Formation. The southern part of research area is built of the Early Eocene deposits of the Zarzecze Formation, which is represented by the thin- and medium-bedded, rhythmic flysch. Within the Zarzecze Formation occur thick-bedded sandstones and conglomerates called Krynica Sandstone Member. In the northern part of studied area occur Middle Eocene deposits of the Piwniczna Sandstone Member representing lower part of the Magura Formation. The Piwniczna Sandstone Member is represented by tick-bedded sandstones and conglomerates, in some places with packages of thin-bedded Beloveža beds-like flysch. In the studied area is formed an anticline, with the Zarzecze Formation in core and the Magura Formation in limbs. An axis of the anticline extends along the northern slope of Jaworzyna Kamienicka Ridge. While the valley adjusted to the orientation of the anticline structure.

A morphology of the analyzed part of Kamienica River valley marked very clearly segments with steep gradient, high and steep banks, and low gradient river segments with extensive terraces. Slops of the Kudłoń and Jaworzyna Kamienicka Ridges surrounding the valley in lower parts have larger declination, while in ridge-zone slopes have much

more lower declination. It is very clearly visible on southern slopes of Kudłoń massive. Common elements in present morphology of investigated area are landslides, which origin in light of the research is connected with occurring here fault zone on NW-SE orientation. Detailed analysis on high resolution digital elevation model allowed to note, that the northern slopes of Kudłoń Mt. is located a large landslide. Morphology of the landslide in later periods was transformed by forming here smaller landslides. Some landslides deposits were accumulated in Kamienice River valley and now in this place where landslide toes were cut by the river is observed steep gradient of river and narrowing of the valley. Above these parts are visible valley's fragments are wide with low gradients. Its genesis connected with dammed valley by landslide. There the flat area is resulted of forming dammed lakes, and filling them by alluvial deposits. During fieldtrip researches in flatting part of the valley have been found sediments filled dammed lakes represented by silts, sandy-silts and grits. The found sediments proved, that hypothesis of existence here dammed lakes in past is true. Actually conducting palynological research, which will get for more detailed age dating of the dammed lakes.

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