

1. RESEARCH PROJECT OBJECTIVES

The reconstruction of the plate tectonic evolution and paleogeographic position of Protocarpathians constitute the main research project objectives. Protocarpathians actually form weakly recognized Paleozoic and/or Precambrian basement, on which the Carpathian Tethys domain developed during Mesozoic and Cenozoic times.

The geochemical, petrological, stratigraphic and geochemical analyses of crystalline rocks of the Carpathian basement, which constitute the exotic material preserved in the Cretaceous and Paleogene flysch rocks cover of the Outer Carpathians, will provide the basis for the objectives achievement.

Particularly, we expect that proposed research will provide the results allowing:

- Assignment of the Protocarpathians to the paleogeographic elements existing during Paleozoic and Precambrian times;
- Reconstruction of plate tectonic evolutionary processes of the Protocarpathian during Paleozoic times;
- Answer to the question whether final consolidation of the Protocarpathian element is the result of Variscan orogeny linked to the Rheic Ocean closure;
- Recognition of the pace of geological processes during the Rheic Ocean evolution.

The project is a continuation and expansion of research that has been recently conducted and is now in the final phase under the project "Pre-Variscan evolution of the Tatra Mountains crystalline massif" (grant no.: 2012/07/B/ST10/04366). The results of this project have been partially published and allow reconstruction of the evolution stages and geotectonic assignment of the Tatra Mountains.

2. RESEARCH PROPOSED

The proposed research:

- a. Field work, outcrop documentation, selection and preparation of research material (preliminary work already performed);
- b. Analyses of minerals important from the point of view of temperature-pressure calculations;
- c. Chemical analyses of rocks and Petrogenetic interpretation of results;
- d. Analyses of morphology and internal structure of zircon, apatite, monazite and titanite;
- e. Analyses of main and trace elements in the above mentioned crystals;
- f. Dating of zircon, apatite, monazite – these minerals occur together but have different temperatures of U-Pb isotopic system closure. The cooling pace and crystallization time can be determined by dating these minerals using the same method;
- g. Palinspastic reconstruction;
- h. The final model describing pre-Variscan evolution of the Protocarpathian region.

3. INFLUENCE OF EXPECTED RESULT ON THE SCIENCE DEVELOPMENT.

The obtained results of petrographic, geochronological and geochemical research will allow:

- Systematic and precise dating of the geological events recorded in the crystalline rocks from Outer Carpathian flysch deposits;
- Evaluation of pace of geological processes for the Carpathian basement;
- Evaluation of the mutual links between Protocarpathians and Cadomian, Caledonian and Variscan elements of Pangea;
- Palinspastic reconstructions on correlation of Protocarpathians on the regional and global scale;
- Recognition of Protocarpathian history and better understanding of the development and later history of Carpathian basins.