DESCRIPTION FOR THE GENERAL PUBLIC (IN ENGLISH)

Our understanding of the development of the Planet Earth has changed markedly since 1912, when Alfred Wegner first proposed that the Earth's continents have drifted across the globe throughout geological history. Although Alfred Wegner's hypothesis was thought to be rather ridiculous at the time, his hypothesis has been accepted since the 1960's to form the base of the theory of plate tectonics. As our continents have drifted across the globe over the eons, they sometimes have collided and dispersed, which both forms and destroys supercontinents, respectively. These tectonic processes have had dramatic effects on the Earth, controlling sea levels, altering climate, as well as forming oceans and the world's great mountain belts (orogens). Pangea, the last supercontinent, formed around 300 million years ago, and broke apart when dinosaurs ruled the Earth, and is the focus of this study.

The formation of Pangea was a critical time in the development of the European landscapes, remnants of which are still preserved. Pangea formed through the collision of two large landmasses, the southern continent was named Gondwana, and the northern one was termed Laurasia. This continent-continent collision induced the orogenesis processes forming the Variscan Mountains (collisional scenario of mountain building). In Europe, the Variscan belt stretched from Spain through central Europe to Poland and onwards toward the south-east. However, the easternmost parts of these two ancient continents was separated by the so-called Paleo-Tethys Ocean. During the evolution of the Earth in the Phanerozoic, that ocean slowly disappeared in the subduction process, forming a volcanic arc along the southern part of Laurasia. It involves the formation of a mountain chain within the continent (the so-called non-collisional tectonic scenario). This is preserved in a chain of mountains in the Black Sea region (e.g., the Pontic mountains).

Although the Variscides are well studied in western and central Europe, its extension into south-eastern Europe is poorly understood, as the Variscan belt to the east of the Bohemian Massif (e.g., Carpathian and Balkan mountains) has been modified by the younger Alpine orogeny. The volcanic arc along the southern margin of Laurasia is preserved in the Black Sea region of Turkey. Therefore, the Sakar mountains, located between the Balkan mountains to the west, and the Black Sea region to the east, is a critical area in the debate for understanding the transition between different tectonic scenarios.

In the heart of the Sakar mountains, a large pluton of granitoids can be found, the Sakar Batholith. The origin of this pluton remains enigmatic, however, it shares many similar temporal and compositional characteristics with the post-collisional Variscan Karkonosze pluton of the Bohemian Massif (Poland). Therefore, the objective of the proposed project is an elucidation of the origin of the Sakar Batholith, as well as the re-evaluation of the south-easternmost part of the Variscides in Europe. To achieve the objectives, a comprehensive petrochronological study will be carried out on the Sakar pluton in south-eastern Bulgaria. This will include detailed geological fieldwork and petrographic, geochemical and geochronological studies, which are lacking in that area.

All of the proposed research will allow to select one of the two contrasting hypotheses:

1) Is the Sakar area of south-eastern Bulgaria connected with a non-collisional tectonic scenario of mountain building (such as a volcanic arc formed due to the subduction process), and therefore, is correlated with the Black Sea region (e.g., Pontic Mountains)?
2) Or, is the Sakar area similar to the Karkonosze pluton, and is a result of a continent-continent collision, therefore representing the easternmost part of the Variscides (collisional scenario)?

Resolving these questions will allow to better understand the paleogeography and tectonic processes occurring ~300 million year ago, which formed a significant part of Europe. It will play an important role in the discussion on the evolution of south-eastern Bulgaria, as well as in the discussion of the Variscan Orogeny.