Seismicity in the southern part of the Harghita Mountains and its possible correlation with recent volcanic activity

Popa M.[1], Radulian M.[1], Szakács A.[2,3], Seghedi I.[2] and Zaharia B.[1]

[1]*National Institute for Earth Physics, Bucharest-Magurele, Romania*
[2] *Sapienţia University, Dept. of Environmental Sciences, Matei Corvin str., 4, RO-400112 Cluj-Napoca, Romania*
[3]*Institute of Geodynamics, Romanian Academy 19-21, Jean-Luis Calderon str., RO-020032 Bucharest, Romania*

The southern part of the Harghita Mountains, in the South-Eastern Carpathians represents the site of the most recent volcanic eruptions from the entire Carpathian-Pannonian region. The products of these eruptions were dated using radiocarbon method ranging 42–10 Ka. The composition of the magmas is high-K calc-alakaline with adakite-like features, characteristic for a post-collisional regime. Ciomadul, the most recent volcano at the southern end of the Harghita Mountains, is situated in the southernmost prolongation of the Călimani-Gurghiu-Harghita range along the inner part of the South-Eastern Carpathians started about 11 Ma ago in the Călimani Mountains and migrated in time and space from NW to SE. Ciomadul volcano is located in the rough proximity of the Vrancea seismic zone (a shift of about 60 km toward NW) and its magma generation is attributed to the geodynamic events closely related to the seismogenic area. Recent investigations show a number of particular geophysical and geochemical features located in the study region including: 1) the abrupt attenuation of the seismic waves coming from the Vrancea intermediate depth foci for paths going towards the southern edge of the Harghita Mountains, 2) the most intense heatflux anomaly in the whole Romania, 3) the most prominent $^{3}He/^{4}He$ anomaly measured in natural gases and thermal mineral waters, are all in favour of the hypothesis of a still existing local hot magma chamber. Until recently, very few earthquakes were recorded in this area. Data acquired during recent seismicity monitoring of the Vrancea zone, also benefited from the stations installed in the interior of the Carpathian bend area suggest a possible enhancement of the local seismicity beneath the southern edge of the Harghita Mountains, both in the crustal and subcrustal levels. At the same time, recent tomography images obtained using local earthquake data correlate well with the presence of a vertical low-velocity material coming from the upper mantle to the assumed magmatic chambers located in the crust.

The purpose of the present paper is to investigate the seismicity patterns in the crust and in the mantle at the inner side of the SE Carpathians, with special focus on the southern Harghita Mountains volcanic area looking for possible correlations with most recent volcanic activity. At the same time, our goal is to integrate the results in a global and coherent geodynamic model and to provide on this basis a first framework for hazard assessment related to possible future activity in Romania.

The stylopodium and zeugopodium of *Mammuthus meridionalis* (Nesti) discovered at Leu, Dolj County (Romania)

Popescu A.

Muzeul Olteniei, str. Popa Şapcă, nr. 8, Craiova, Romania

The paleontological deposit from Leu, discovered in 1998, is situated 25 km southeast from Craiova (South-West of Romania). This deposit is located on the right slope of the Frasin Valley, at about 10 m height as against the stream of water, in a sand and gravel quarry.

The paleontological content is the following: *Mammuthus meridionalis*, *Stephanorhinus* group *etruscus*/*hundsheimensis*, *Equus stenonis* Cocchi, *Leptobos etruscus* Falconer, *Leptobos* sp., *Eucladoceros* sp., *Castor plicidens* Major, *Ursus etruscus* Cuvierand a few coproliths belonging to a canid.

The mammalian association from Leu was attributed to Pleistocene, namely to the zone MN 18.