



Noble gas monitoring at the seemingly inactive Ciomadul volcano, Eastern Carpathians, Romania

Boglarka-Mercedesz Kis^{1,2,3}, Szabolcs Harangi², László Palcsu³, and Botond Hegyeli⁴

¹Babes-Bolyai University, Faculty of Biology and Geology, Department of Geology, Cluj-Napoca, Romania
(kisboglarka85@gmail.com)

²MTA-ELTE Volcanology Research Group, Eötvös University, Budapest, Hungary

³Isotope Climatology and Environmental Research Centre, ATOMKI, Debrecen, Hungary

⁴Vinca Minor Association, Sfantu-Gheorghe, Romania

The Ciomadul volcano is the youngest volcano (32 ka) built by the Neogene volcanism in the Carpathian-Pannonian Region. This volcanic area is characterized by intense gas emissions (Kis et al., 2017) (CO₂, CH₄, H₂S) in the form of bubbling pools, mofettes and mineral water springs. The isotopic compositions of carbon, ¹³C_{CO2} up to -3‰ VPDB and helium up to 3.1 Ra suggest magmatic origin of the gas up to 80% (Kis et al., 2019).

Although the volcano seems to be inactive, several features, petrologic and geophysical studies suggest that melt-bearing magmatic body could still exist beneath the volcano (Harangi et al., 2015). Moreover the geodynamic system is characterized by frequent earthquakes with magnitude up to 7 at Vrancea area, close to the CO₂-rich gas emissions of Ciomadul and the neighbouring areas.

In 2015 we started the monitoring of the helium isotopic ratios of Ciomadul to check the possible relationship with seismicity. Our results show that in several cases the helium isotopic ratios increase at a seismic event with magnitude between 4 and 5.8 suggesting a relationship between the two phenomena.

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