

## 1. Research activity

The goal of the PhD project is to reconstruct the explosive volcanic history of the Ulukışla Caldera to better understand the volcanic evolution of the Hasandağ Volcanic Complex.

Specific objectives of this PhD project: 1) identifying and characterising pyroclastic deposits around Hasandağ and Ulukışla Caldera using stratigraphic correlations, geochemistry, and geochronology analyses; 2) elaborating a geological map of the Ulukışla Caldera products, including the newly differentiated pyroclastic deposits; 3) acquiring glass chemistry and geochronological databases for future tephrochronological studies; 4) interpreting the eruption dynamics of the Belbaşhanı Pumice and estimating the fundamental physical volcanology parameters to better understand volcanic hazards in the region.

I conducted several fieldworks around the Ulukışla Caldera, Hasandağ, and Keçiboyduran volcanoes. During these field campaigns, I did detail deposit descriptions, geological mapping and stratigraphic logging to differentiate pyroclastic units. Following the fieldwork, I analysed the glass geochemistry of collected samples to characterise pyroclastic deposits. Major element analyses were performed using an electron probe micro-analyser (EPMA) equipped with five wavelength dispersive spectrometers (WDS) at the Istituto Nazionale di Geofisica e Vulcanologia (INGV) in Rome. The trace element analyses were

conducted using Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS) at the Institute of Geochemistry and Petrology of the ETH Zürich (Switzerland). Pyroclastic deposits were dated by  $^{40}\text{Ar}/^{39}\text{Ar}$  and U-(Th)-Pb methods. I completed my internship at the Scottish Universities Environmental Research Centre (SUERC), where I participated in the  $^{40}\text{Ar}/^{39}\text{Ar}$  dating sample preparation processes. I conducted a physical volcanology study using Belbařhanı Pumice fallout deposits. I reconstructed the eruption dynamics of the Belbařhanı Pumice and estimated the eruption source parameters, together with associated uncertainties for more accurate volcanic hazard assessment in the region.

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## 2. Research products

### Publications

- **Özsoy, R.**, Sunyé-Puchol, I., Pedrazzi, D., Akkař E., Costa, A., Massaro, S., Tavazzani, L., Nazzari, M., Bachmann, O., Scarlato, P., Miggins, D.P., Kaya, S., Mollo, S., (2024). Reconstructing the Belbařhanı Pumice Plinian eruption, Hasandağ Volcano, Turkey. *Bull. Volcanol.* 86:61. <https://doi.org/10.1007/s00445-024-01752-6>.
- **Özsoy, R.**, Sunyé-Puchol, I., Bolós X., Akkař E., Costa, A., Tavazzani, L., Miggins, D.P., Nazzari, M., Bachmann, O., Scarlato, P., Mollo, S. Reconstructing the volcanic history of Ulukıřla Caldera: A collapse structure within the Hasandağ Volcanic Complex, Central Anatolia (Turkey). *J Volcanol Geotherm Res.* (under review).

Preprint available at SSRN: <https://ssrn.com/abstract=5011398> or <http://dx.doi.org/10.2139/ssrn.5011398>

## Conferences

- **Özsoy, R.**, Sunyé-Puchol, I., Pedrazzi, D., Akkaş, E., Costa, A., Aydar, E., Tavazzani, L., Massaro, S., Nazzari, M., Miggins, D.P., Kaya, S., Mollo, S. (2024). PICO presentation. “New insights into the Belbaşhanı Pumice Plinian eruption: tephrostratigraphy, eruptive history and implications for volcanic hazards posed by Hasandağ (Central Anatolia)”, EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024, EGU24-659, <https://doi.org/10.5194/egusphere-egu24-659>.
- **Özsoy R.**, Sunyé-Puchol I., Pedrazzi D., Miggins D.P., Aydar E., Akkaş E., Tavazzani L., Mollo S. (2023) Oral Presentation. “Reconstructing the recent eruptive history of Hasandağ volcano by tephrostratigraphic correlations along the Belbaşhanı Valley, Central Anatolia, Turkey”, The Geoscience paradigm: resources, risks and future perspectives, 19-21 September 2023, Potenza, Italy.
- **Özsoy R.**, Sunyé- Puchol I., Aydar E., Pedrazzi D., Akkaş E., Mollo S. (2023) Poster Presentation. “Volcanic reconstruction of the Belbaşhanı Pumice eruption: a late Quaternary fallout deposit emitted in the Central Anatolian Volcanic Province (CAVP), Turkey”, XXI INQUA Congress, 14-20 July 2023, Rome, Italy.
- **Özsoy R.**, Sunyé-Puchol I., Aydar E., Pedrazzi D., Akkaş E., Mollo S. (2023) Oral Presentation. “Characterization of Belbaşhanı Pumice in Central Anatolian Volcanic Province (Turkey)”, 75<sup>th</sup> Geological Congress of Turkey with International Participation, 10-14 April 2023, Ankara, Turkey.