Rožič *et al. Swiss Journal of Geosciences* (2024) 117:19
https://doi.org/10.1186/s00015-024-00467-2

SGG SGS sc | nat
Swiss Journal of Geosciences

EDITORIAL Open Access

Special Issue: 15th Emile Argand Alpine Workshop, Ljubljana 2022, Slovenia

Boštjan Rožič[1*], Marko Vrabec[1] and Stefan Schmid[2]

This special issue of Swiss Journal of Geosciences aggregates a series of papers, which emerge from the 15th Workshop on Alpine Geological Studies (Emile Argand Conference sponsored by EGU), commonly known as the Alpine Workshop or just Alpshop. Initially, the conference was scheduled to take place in the 2021 in northern Italy, but was cancelled due to the unpredictable Covid19 epidemic situation. Subsequently, Slovenian geologists accepted the challenge of organisation and the conference was eventually held one year later in Ljubljana, the capital of Slovenia. It was organized by the Department of Geology of Faculty of Natural Sciences and Engineering, University of Ljubljana, with collaboration of the Geological Survey of Slovenia and Geological Society of Slovenia. The conference took place in a beautifully restored Montanistika building between September 12th and 14th 2022, geologically situated at the northern margin of the External Dinarides, offering views at the rising eastern Southern Alps in the north. The location conveniently matched with the main goal of the conference, namely, to provide the advances in comprehensive understanding of the entire peri-Mediterranean orogenic system and the processes shaping the orogens in general, amalgamating contributions across a wide range of geological disciplines such as tectonics and structural geology, petrology and geochemistry, geochronology, sedimentology and basin analysis, geophysics and geomorphology.

*Correspondence:
Boštjan Rožič
bostjan.rozic@ntf.uni-lj.si
[1] Department of Geology, NTF, UL, Aškerčeva C. 12, 1000 Ljubljana, Slovenia
[2] Department of Environmental Sciences, Universität Basel, Basel, Switzerland

The Alpine workshop 2022 offered four field trips. A pre-conference 3-day field trip to Western Slovenia focused on the sedimentary and structural evolution of the Alps-Dinarides transition zone. After the conference, a rainy 3-day field trip was led to study the metamorphic core complex of the Pohorje Mts. A 1-day field trips visited the paleontologically rich Velika planina site in the Kamnik-Savinja Alps and another 1-day field trip illustrated geo-archaeological studies of Jurassic limestones in the surroundings of Ljubljana (Roman Emona). Also a half-day geological walking tour of Ljubljana was organized in the morning after the conference for participants waiting for their late transport. Since the 16th INTERRAD International Conference on Fossil and Living Radiolaria was concurrently held in Ljubljana, Alpine Workshop participants were additionally offered a possibility to participate in excursions of this conference, which visited Austria and Montenegro. Constructive scientific debates and a relaxed atmosphere marked the socio-scientific evening event, which was held at the Ljubljana Castle and was enriched by Geobanda musical group composed entirely of Slovenian geologists.

Eighty participants from seventeen countries attended the Alpine Workshop 2022, thirty-eight oral presentations and twenty-two posters were presented in nine sections. The Alpine workshop 2022 was enriched by three invited speakers: Michał Krobicki presented the paleogeographic importance of the Czorsztyn Ridge in the evolution of the Polish-Ukrainian Carpathians, Mark R. Handy presented a synthesis of the results from the AlpArray project, and John Milsom synthetized data about the Philippines and the Luzon syntaxes.

The organizers Boštjan Rožič (chair), Rok Brajkovič, Matevž Novak, Tomislav Popit, Andrej Šmuc, Marko Vrabec, and Petra Žvab Rožič are acknowledged for

taking on a challenging task during unpredictable times. All reviewers of papers submitted to this Special Volume are thanked for thorough reviews of the manuscripts. The scientific committee is thanked for its professional work while László Fodor, Luka Gale, Tomaž Hitij, Kristina Invančič, Marian Janák, Duje Kukoč, Stanka Šebela, and Mirijam Vrabec kindly assisted the field trips. We also fully acknowledge financial support by the European Geosciences Union (EGU), the Geological Survey of Slovenia (GeoZS), the Slovenian Geological Society (SGD), the Institute for mining, geotechnology and environment (IRGO) and Salonit Anhovo. Students Maja Kotar, Karin Moder, Maša Planinc and their mentors Nace Pušnik, Gregor Franken from the Department of Textiles, Graphic Arts and Design from the organizing faculty were responsible for the overall attractive graphical appearance of the conference. Many other unnamed individuals are also sincerely thanked for their important contribution.

The five contributions SJG received for this Special Volume focus on topics, which are not strictly "Alpine". One of them discusses extra-Alpine Asian tectonic units that are arranged in an equally complex puzzle, as are the Alpine-type orogens of the Mediterranean realm. The other four articles address the transitional area between Alps, Dinarides and Western Carpathians.

John Milsom (2023) synthesises a huge amount of geophysical and tectonic data on the Indo-Pacific gateway. The aim of his review is to familiarize the Alps community with the enormous complexities of an area that is characterized by still ongoing processes of subduction and associated asthenospheric flow. Similar complexities must have governed the early Alpine evolution of the Mediterranean area of which the Alps s.str. are but a small element. In the Alpine-Mediterranean area, however, early structures became largely destroyed by overprinting during final collisional processes (Alps, Dinarides and Carpathians), or alternatively, new oceanic (i.e. Western Mediterranean) and continental (Pannonian Basin) extensional events heavily overprinted earlier collisional events. Knowledge about the future collisional orogenic system in the SE Asian domain that is at a much earlier stage of its development is undoubtedly of value when seeking to better understand the early Alps.

Reiser et al. (2024) investigate the Troiseck-Floning and Rosskogel nappes that are part of the Austroalpine nappe stack in the southeastern Alps. Their study provides a wealth of new geochronological data on pre-Alpine rock suites occurring in these nappes, on the basis of which they convincingly argue that the two nappes represent the lateral extension of the Seckau Nappe. Their work also offers new clues to improve the still underexplored correlations of the Eastern Alps with parts of the Western Carpathians such as the Tatric and Veporic units.

Smirčić et al. (2024) present facies variability and distribution of Middle Triassic volcanoclastic rocks in NW Croatia found in the transition zone between Southern Alps and Dinarides. They interpret formation processes and magma genesis with the aim to provide more insight into the complex geodynamic evolution of the region governed by the opening of Neotethys. They conclude that parental magmas formed from partial melting of the heterogeneous lithospheric mantle metasomatised during an earlier Hercynian subduction and subordinate processes related to the melting of the upper continental crust. The results strongly suggest that the region experienced concurrent bimodal volcanism in Middle Triassic times.

Rožič et al. (2024) also deal with the crustal extensional events, which affected the Adria promontory during the Middle Triassic. They elucidate the architecture and evolution of a small intra-platform sedimentary basin located at the northern margin of the External Dinarides in central Slovenia, i.e.an area that is relatively close to the boundary with the Southern Alps. Unlike the larger-scale coeval basins of the surrounding wider region, the studied basin was very sensible for the interplay of tectonic/sedimentary factors influencing its origin, evolution and demise. The studied basin documents three intervals of intense differential subsidence (basin deepening) and volcanic activity, which were twice interrupted by a complete platform progradation and finally its emergence at the beginning of Late Triassic.

Vukovski et al. (2024) present yet another study carried out in the boundary area between northernmost Dinarides and northerly adjacent Alpine units. Their structural analysis, accompanied by low temperature thermochronology, was carried out in an isolated inselberg surrounded by Miocene deposits of the Pannonian basin whose relationships with Dinarides and Alps were so far only badly known and hence controversial. The tectonic events and their timing indicate that the Ivanščica inselberg was mainly affected by deformational events related to the Mesozoic evolution of the Neotethys Ocean whose relics are found in the internal Dinarides, as well as by late Cenozoic opening and inversion of the Pannonian Basin. Based on this, the Mesozoic tectono-sedimentary evolution of Ivanščica Mountain is proof of a paleogeographic affiliation of its non-ophiolitic Mesozoic structural-stratigraphic entities to the Pre-Karst unit of the Dinarides rather that of the southern Alps.

Published online: 28 September 2024

References

Milsom, J. 2023: East Asian analogues for early Alpine orogenesis. Swiss Journal of Geosciences, *116*, 20.

Reiser, M. K., Schuster, R., Iglseder, C., Gallhofer, D., & Nievoll, J. (2024). Geochronology, geochemistry, and geological evolution of the Troiseck-Floning and Rosskogel nappes (Eastern Alps): Unraveling parallels between the Eastern Alps and Western Carpathians. *Swiss Journal of Geosciences, 117*, 11.

Rožič, B., Kocjančič, A., Gale, L., Zupančič, N., Popit, T., Vodnik, P., Kolar-Jurkovšek, T., Brajkovič, R., & Rožič, P. Ž. (2024). Architecture and sedimentary evolution of the Ladinian Kobilji curek basin (External Dinarides, central Slovenia). *Swiss Journal of Geosciences, 117*, 3.

Smirčić, D., Vukovski, M., Slovenec, D., Kukoč, D., Šegvić, B., Horvat, M., Belak, M., Grgasović, T., & Badurina, L. (2024). Facies architecture, geochemistry and petrogenesis of Middle Triassic volcaniclastic deposits of Mt. Ivanščica (NW Croatia): Evidence of bimodal volcanism in the Alpine-Dinaridic transitional zone. *Swiss Journal of Geosciences, 117*, 5.

Vukovski, M., Špelić, M., Kukoč, D., Troskot-Čorbić, T., Grgasović, T., Slovenec, D., & Tomljenović, B. (2024). Unravelling the tectonic evolution of the Dinarides—Alps—Pannonian Basin transition zone: Insights from structural analysis and low-temperature thermochronology from Ivanščica Mt., NW Crotia. *Swiss Journal of Geosciences, 117*, 16.

Publisher's Note