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Gondvana-Derived Relicts in the Construction of the Caucasus Collisional Orogen

OKROSTSVARIDZE A.¹ CHUNG S.-L.², TORMEY D.³

¹ Iliia state University, 0162 Tbilisi, Georgia E-mail okrostsvari@gmail.com

² Institute of Earth Science, Academia Sinica, 11529 Taipei, Taiwan

³Cardno ENTRIX, CA 90024 Los Angeles, California, USA

The Caucasus Phanerozoic collision orogen is accreted to the south margin of the Eurasian continent and was formed at the closure of Proto-, Paleo- and Meso- Tethys oceans. Currently it represents the complex segment connecting the Mediterranean and Iran-Himalayan Tethyan orogenic belts, between the Gondvana-derived Arabian plate and East European platform. Its northern border runs along ophiolite zone of the Greater Caucasus foothills, which is an eastern continuation of the Trans-European suture zone and the southern border - along the Bitlis-Zagros suture zone.

Currently Caucasus orogen is constructed by terranes, which are separated from each other by ophiolitic suture zones or powerful tectonic faults [1]. Modern research shows that in the North Mediterranean crust formation significant role was played by Gondvana-derived micro-plats, which formed after the destruction, in the ordovician period, of the Gondvana southern edge [2]. Large part of the them started moving towards the North and accreted at the S-E edge of the Baltic continent. Actually they created the skeleton, which underwent significant thermal recycling and composition evolution, and gradually formed the modern crust of the Caucasus orogen [3]. Despite the multiple tectonic, metamorphic and thermal processing (Variscan, Cimmerian and Alpine), they have still preserved Gondvanian relicts, which are considered as pre-Variscan "crystalline basement" [3]. The complex geological and isotopic (Sm-Nd, U-Pb, Rb-Sr and ⁴⁰Ar-³⁹Ar systems) data of these relicts, enabled us to restore the history of their evolution. Recent work also confirmed the existence of Gondvana-derived relicts and its important role in the construction of the Caucasus orogen crust. The Caucasus Carboniferous granitoids (330-305 Ma; U-Pb, Rb-Sr and ⁴⁰Ar-³⁹Ar age) contain numerous inherited zircons of a major Hf isotopic age distribution at ca. 700-500 Ma and strongly various Hf isotope composition, indicating an affiliation with magmatic activities that produced the juvenile Arabian-Nubian Shield crust and reworked Neoproterozoic materials in the Northern Gondvana .

According to our data, Gondvana-Derived relicts were organically involved in the processes of the Caucasus orogen construction formation and they have created vertically and horizontally accretion skeleton, which partial conversion (metamorphism, ultrametamorphism, recycling), basement of the Caucasus orogen I crust was formed, at the southern edge of the East European platform. Currently, Gondvana-Derived relicts are represented in the pre-Variscan and Varisscan formations (from the North to South) of the, Dzirula, Khrami, Loki, Akhum, Asrikchai and Cakhkunan massifs .

References:

[1] Gamkrelidze (1997) *Bull. Georg. Ac. Sci.* 155(3):75-81

[2] Raumer et al. (2003) *Tectonophyis* 365: 45-58

[3] Okrostsvaridze & Thormay (2014) *Episodes* 36 (1): 31-39

