

## **Final assembly of Gondwana along its northern margin: Revising the suture geometry based on evidence from the Iranian-Turkish Plateau**

Rezvaneh Jamali Ashtiani (1), Jamshid Hassanzadeh (2), Axel K. Schmitt (3), Mohammad Rahgoshay (1), and Edward Sobel (4)

(1) Shahid Beheshti University (M-Rahgoshay@sbu.ac.ir), (2) Geological & Planetary Science, California Institute of Technology, USA (jamshid@caltech.edu), (3) Heidelberg University, Germany (axelkschmitt@gmail.com), (4) Potsdam University, Germany (ed@geo.uni-potsdam.de)

The existing reconstructions of Gondwana suffer from uncertainties about its northern extensions due to the episodic separation of rifted blocks and their accretion to the Alpine-Himalayan orogenic belt during the Phanerozoic times. Using new data and the published information we synthesize an Ediacaran (630-542 Ma) thickened continental belt whose fragments are now dispersed in a 2300-km-long NW-SE trending zone within the Iranian-Turkish Plateau. The belt is characterized by Barrovian and high-P metamorphic associations which include metasediments, orthogneisses and metabasites with amphibolite to eclogite grade rocks. Three metamorphic complexes in the Sanandaj-Sirjan zone of Iran (Zayanderud, Dorud-Azna, and Khoy) and one complex in Turkey (the Menderes Massif) are correlated based on similar rock compositions and U-Pb zircon ages. Metabasites are shown to be largely derived from tholeiitic magmas displaying continental basalt affinity. Orthogneisses are calcalkaline and reveal arc-like trace element geochemistry. Magmatic crystallization ages throughout the belt lie entirely in the Ediacaran Period range: 560-586 Ma (Zayanderud), 588-608 Ma (Dorud-Azna), 550-595 Ma (Khoy), and 552-570 Ma (Menderes). Recognition of this orogenic belt within the Arabia-Eurasia collision zone begs the question of which way the Menderes eclogitic terrain was connected to the known Pan-African orogenic belts, e.g., the East African orogen. There are various paleogeographic suggestions for this part of Gondwana at the end of the Precambrian time which can be tested using our compiled dataset. A recent scheme assumes that the connection of the Menderes eclogitic terrain and the East African orogen was through the Arabian Peninsula. The thick Phanerozoic cover precludes any easy testing of the crystalline basement of the Arabian plate for the presence of similar rock associations. Our data favors the alternative connecting path via a roughly E-W-trending orogen (in present-day coordinates) that linked the Menderes Massif to the Sanandaj-Sirjan zone of Iran and then to the Afghan and Tibet blocks. We also examine another possible reconstruction through the Sanandaj-Sirjan zone onto the high-P terrain of south India. The ensuing results are expected to considerably revise plate tectonic and paleogeographic view of the final assembly of the Gondwana at its northern borders.