Geophysical Research Abstracts
Vol. 17, EGU2015-558, 2015
EGU General Assembly 2015

Geometry And Timing Of The Palaeo-Tethyan Marginal Basins At The Heart Of Pangaea

Nurbike G. SAĞDIÇ (1), A.M. Celal ŞENGÖR (1,2), Gürsel SUNAL (2), and Yücel YILMAZ (2)

(1) Avrasya Yer Bilimleri Enstitüsü, İstanbul Teknik Üniversitesi, İstanbul, 34469, Türkiye, (2) Jeoloji Bölümü, Maden Fakültesi, İstanbul Teknik Üniversitesi,İstanbul, 34469, Türkiye

The Hercynian Orogen, one of the best-known orogenic belts in the world, still hides many secrets concerning its evolutıon. This orogen formed through the collision between Laurussia and Gondwana-Land, which resulted in the supercontinent of Pangaea. Pangaea's formation began in the late Devonian with the onset of subduction and continued from the early-medial Carboniferous to the Permo-Triassic by means of collision. However, at the eastern part of this supercontinent, collision never happened and subduction continued in the Permo-Triassic. The coast of the Palaeo-Tethys known as Alpine-type Triassic succession was the scene of high mobility events in the core of the Pangaea in terms of Hercynian and Post-Hercynian stages. It is a fact that when the subduction process was still continuing, a rifting event began in the Permo-Triassic at the eastern part of Pangaea by disrupting a magmatic arc. Here, we present the geological and geometrical structures of this rift zone from the Permo-Triassic to the Jurassic-Cretaceous in which the rift zone closed and discuss the tectonic implications for the evolution of the Hercynian Orogeny. By using the comparative anatomy of orogens, the tectonic zones including the magmatic arc of the orogen was identified and by using a basic reconstruction showing the proper positions of these tectonic units, the spatial continuity of the core of the orogen was determined. The results show a continuous arc goes from the Rhodope-Pontide Fragment in the north, through the Eastern Carpathians, Tisza Block, Western Carpathians, and Pelagonian Zone, to the Eastern Pontides in the south. Additionally, the lithostratigraphic charts of all the tectonic zones indicate the volcano-sedimentary complexes, which show a rifting event as their most likely interpretation. As a consequence of this rifting, a marginal basin started to form beginning from the eastern part and tore westward by tracing the weak zones of the former arc. It began to take shape from the Karakaya Complex, goes through the Pelagonian zone and the Inner Western Carpathians namely Meliaticum into the Tisza Block in the Late Permian-Early Triassic. From the medial to the end of the late Triassic, the entire Hellenic-Dinaric System and Italy began to disintegrate, which started from the Pindos Zone in Hellenides and Sicily in Italy, and joined together into the Southern Alps by passing through all along the coast of the present Adriatic Sea. Ultimately, at the end of the Triassic the rift zone formed three branches; one comes from the Karakaya Complex to the Southern Alps in which splitting into two branches; one continued to tear the former arc along the coast of the Palaeo-Tethys, one turn into the present Italy. The resulting framework shows a triple junction geometry for the rift zone right at the core of the late Paleozoic arc orogen just like the one at the end of the New Zealand/Tonga-Kermadec arc system in the Lao Basin.