



## **Geochemistry and Geochronology of Oceanic Rock Assemblages in the Izmir-Ankara-Erzincan Suture Zone, Turkey**

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We report here new data from the Izmir-Ankara-Erzincan Suture Zone (IAESZ), which connects the Vardar Suture Zone in the west with the Sevan-Akera Suture Zone in the east. It occurs between the Sakarya Continent and the Anatolide-Tauride ribbon continent in Turkey, and consists mainly of ophiolitic thrust sheets emplaced into a subduction-accretion mélangé. The ophiolites include upper mantle peridotites, cumulate to massive gabbros, sheeted doleritic dykes, plagiogranite dykes and stocks, and basalt-chert-radiolarite as in a complete Penrose-type ophiolite pseudostratigraphy. They display a geochemical progression in their magmatic evolution from initially MORB-like to island arc tholeiites (IAT) to boninites, similar to many other Tethyan ophiolites in the eastern Mediterranean region. Boninitic dykes and volcanic rocks have very low  $\text{TiO}_2$  (0.03-0.50 wt.%), Nb (0.03-1.9 ppm), Y (1.9-10.7 ppm) and Zr (4.10-42 ppm) values. IAT-type doleritic dykes and basaltic lavas contain low  $\text{TiO}_2$  (0.42-1.04 wt.%), Nb (0.90-2.7 wt.%), Y (9.7-33.3 ppm) and Zr (12.7-85 ppm). The  $\text{TiO}_2$  (0.81-2.60 wt.%), Nb (3.30-4.8 ppm), Y (22.6-63.8 ppm) and Zr (36.01-179.33 ppm) contents of the MORB-like basaltic rocks are higher than those in the IAT and boninitic lavas. The subduction-accretion mélangé (Ankara Mélangé) in the central part of the IAESZ, includes volcanic mega-blocks derived from seamounts and/or an oceanic plateau that have OIB and P-MORB geochemical characteristics. This subduction-accretion complex also contains blocks of MORB- and/or IAT-like ophiolite fragments within a matrix composed of serpentinite, altered volcanics-volcaniclastics and/or pelitic sedimentary rocks. Pegmatitic gabbros in the ophiolites in the western and eastern IAESZ reveal  $^{40}\text{Ar}$ - $^{39}\text{Ar}$  hornblende ages of 168.9 Ma and  $195.7 \pm 2.7$  Ma, respectively. Plagiogranite dykes in the central and eastern parts of the IAESZ are 180 Ma and  $179 \pm 2$  Ma to  $180.1 \pm 2.4$  Ma in age as determined from U-Pb from zircon dates. The ophiolitic thrust sheets within the entire IAESZ are hence nearly coeval and are contemporaneous with the ophiolites in the Vardar Suture Zone in the Balkan Peninsula. The  $^{40}\text{Ar}$ - $^{39}\text{Ar}$  dates from the volcanic rocks of the seamount fragments give  $99.6 \pm 1.8$  to  $72.8 \pm 3$  Ma ages and of the oceanic plateau fragments reveal an age of  $96.6 \pm 1.8$  Ma. These geochemical and geochronological data, combined with the structural field observations, indicate that the Tethyan oceanic lithosphere, the fragments of which are now exposed within the IAESZ, evolved in the Triassic-Jurassic (likely even earlier in the late Paleozoic) through the late Cretaceous between Sakarya and Anatolide-Tauride continental blocks, and that it is structurally and geochemically much more heterogeneous than previously thought.