New U-Pb and Rb-Sr ages from northwest Turkey; Early Cretaceous continental collision in the western Pontides

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We provide new isotopic data from the Intra-Pontide Suture Zone, which indicate Early Cretaceous collision between the Sakarya and ˙Istanbul terranes following the consumption of the Intra-Pontide Ocean. The study area is located south of Sapanca Lake between the ˙Istanbul and Sakarya terranes in northwest Turkey. These two terranes show different geological histories, as reflected in their stratigraphic record, and are juxtaposed along the Intra-Pontide suture. The new U/Pb zircon and Rb/Sr mica ages come from south of the Sapanca Lake, south of the North Anatolian Fault in northwest Turkey. The ˙Istanbul terrane has a late Proterozoic basement (Chen et al., 2002; 570 Ma) overlain by a sedimentary sequence of Ordovician to Carboniferous age. The Sakarya terrane is characterized by Carboniferous (330-310 Ma) high temperature metamorphism (Okay et al., 2006), Paleozoic granitic plutonism (Topuz et al., 2007) and by the presence of Palaeo-Tethyan subduction-accretion units.

South of the Sapanca Lake, three main tectonostratigraphic units have been differentiated forming a northeastward dipping thrust stack. At the top of the thrust stack is an amphibolite-facies metamorphic unit consisting of an intercalation of amphibolite, metaperidotite, metapyroxenite and gneiss representing a Proterozoic metaophiolite in the basement of the Istanbul Zone. This old metaophiolite is underlain by a Cretaceous accretionary complex of metabasite, metachert, slate and serpentinite. The lowermost tectonic unit in the thrust stack is a metasandstone, slate, phyllite and marble unit metamorphosed in greenschist facies.

Our U/Pb geochronological data comes from the basement gneisses and the metasedimentary unit. The age of deposition and metamorphism of this metasedimentary unit were not constrained. The U/Pb ages of the clastic zircons from metasandstones are between 500-317 Ma. These new clastic zircon ages from the metasedimentary unit show that deposition of the sandstones must be later than Carboniferous (316±2.4 Ma).

The Rb-Sr muscovite and biotite ages from metasedimentary unit and the basement gneisses give Early Cretaceous (138-111 Ma) ages. The muscovite ages of metasandstones are 138±1.5 Ma represents the metamorphic age of metasedimentary unit and the biotite Cretaceous cooling age of 111,3±1,1 Ma from the reheating of the Proterozoic basement.

The new Rb/Sr ages indicate that the collision between the Istanbul and Sakarya terranes occurred during the Early Cretaceous.

REFERENCES
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