



The Mesozoic-Cenozoic tectonic evolution of western Central Iran seen through detrital white mica

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A first order survey of Ar-Ar dating of detrital white mica from Jurassic to Pliocene sandstones has been carried out in order to reveal the tectonic evolution of blocks in Central Iran (Saghand area). The Central Iran block was believed to represent a stable Precambrian block. Our results indicate: (1) There is only a very small proportion of bearing detrital mica in the hinterland suggesting to full Phanerozoic nature of metamorphic crust exposed in Central Iran. The oldest but scarce detrital white mica grains have ages ranging from 517 to 817 Ma heralding a Late Precambrian and Cambrian crystalline basement or cannibalism from older clastic successions. (2) Jurassic and Cretaceous sandstones from west and east of the Chapedony fault yield different age spectra, with a dominance of Variscan ages (ca. 305 – 360 Ma) compared to coeval sandstones from the block east of the Chapedony fault, where Variscan ages are subordinate and Cimmerian ages predominate. These micas are likely derived from the Variscan accretionary complex exposed in the Anarak-Jandaq areas further northwest. This result underlines a major block boundary identified as the Chapedony fault, which is in extension of a fault previously proposed. (3) Two stages of Cimmerian events are visible in our data set from Cretaceous and Paleogene sandstones, a cluster around 170 Ma and at ca. 205 Ma. These clusters suggest a two-stage Cimmerian evolution of the Posht-e-Badam and Bonev Shurov complexes not well understood up to now. (4) The youngest micas in Paleogene conglomerates have an age of ca. 100 Ma are likely derived from the base of the Post-e-Badam complex. No record of the uplifted Eocene Chapedony metamorphic core complex has been found in Eocene and Pliocene clastic rocks. These are likely due to the scarcity of white mica in that complex as fine-grained white mica only occurs in the Neybaz-Chatak shear zone along the hangingwall boundary of that complex.