# The evolution of the Aegean Arc re-assessed: new radiogenic isotope data and $^{40}Ar/^{39}Ar$ ages

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The evolution of the Aegean subduction zone has been controlled since the Cretaceous by convergence of Africa and Eurasia, including collision of Gondwana terranes and micro continents. Additionally the realm is dominated by the westward extrusion of Anatolia and north-south extension in the Aegean. Further, slab fragmentation was triggered by lithological east-west variations in overriding and subducted plates, as well as varying velocity and dip of the subducting slab.

This study focuses on new Pb-Sr-Nd-Hf isotopes, trace elements and new $^{40}Ar/^{39}Ar$ data of Miocene to recent volcanic rocks from a N-S transect in the Aegean Sea. The data provide constraints on magma sources and the timing of events like the opening of a slab window, slab detachment, slab role back and the subduction of micro continents. The geotectonic evolution resulted in different episodes of magmatism, reflected by distinct isotopic signatures for different volcanic centres on the islands Lesbos, Chios, Patmos, Kos and Nisyros. However, an enriched mantle source and crustal contamination is seen in the radiogenic isotope signature of all samples. $^{206}Pb/^{204}Pb$ isotope ratios range from 18.3-19.1 and suggest a significant crustal influence that is supported by Nd, Sr, Hf isotopes. This crustal signature may derive from melting of subducted crust, melting of subducted sediments or assimilation of arc crust. Further, radiogenic isotopes and trace elements show a clear component of enriched mantle material in the volcanic rocks. Zr/Nb ratios are low, with values of~0.3. This enriched signature is confirmed by $^{143}Nd/^{144}Nd$ ratios ranging from 0.5126 to 0.5122. With new obtained $^{40}Ar/^{39}Ar$ dates we will try to answer the question when the slab tear was initiated and since when it facilitated the rise of enriched mantle material. Are the strongly enriched Langhian to mid Burdigalian volcanic rocks of Chios representing this onset or did the slab window exist earlier and already influenced the enriched Aquitanian to Burdigaliean rocks of Lesbos?