Central Iranian volcanic belt: Implication of the transtensional basin system

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Urumieh-Dokhtar magmatic zone has been considered as a place for the main magmatic activities in the Central Iranian continent in the Cenozoic age. Explosive activities in Paleogene and early Neogene were commonly from fissure eruptions and feeder dikes had a domonant role for creation of thick sequences of magmatic and pyroclastic rocks. In the late Neogene, centeral vent eruptions caused for creation of strata-volcanoes in the study area and varient of volcanic domes in continental environment. The Neogene volcanic activities are divided into two phases: Ngv_1 and Ngv_2. At the first stage (Ngv_1), volcanic rocks contain basalt to andesite-basalt as lava or pyroclastic materials. The explosive event was followed by the volcanic to subvolcanic associations of Ngv_2 with products of mainly andesitic to rhyiolitic composition. The volcanic domes of Ngv_2 and their diverse modes of emplacement are especially characteristic of this phase as Kuh-e-Aleh. Geochemical and Isotope geochemistry data confirm the presence of transtensional regions along the Urumieh-Dokhtar magmatic zone, opened during Paleogene and early Neogene due to the collision of the Arabia platform and Central Iranian continent.

Coral Li/Ca in micro-structural domains as a temperature proxy

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Coral skeletons are valuable geochemical archives of environmental change, although coral physiology has to varying degrees imprinted a 'vital effect' complicating paleo-climate reconstructions. In order to decipher environmental from physiological effects we have utilised high sensitivity laser ablation ICPMS to examine Li/Ca variations in the aragonite theca of living specimens of shallow (*C. caespitosa*) and deep-water (*L. pertusa)* corals at different temperature-depth regimes, together with samples cultured in temperature-controlled tanks. The Li/Ca variations at micron-resolution are large and correlated with centres of calcification versus fibrous aragonite. The Li/Ca composition of the fibrous aragonite however appears to be primarily controlled by water temperature with the distribution coefficients ($D_{Li/Ca}$) of *L. pertusa* rapidly decreasing with increasing water temperature indicating a stronger sensitivity for Li/Ca at lower temperatures, whereas the $D_{Li/Ca}$ for *C. caespitosa* follows an exponential regression. The application of coral Li/Ca paleothermometry on specifically identified micro-structural domains thus offers a unique opportunity to reconstruct changes in water temperatures at different depths in the water column.