



The volcanism of the Comores archipelago: mantle plume or lithospheric deformation?

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The development of the Comores archipelago in the Mozambique channel has been diversely interpreted since the 1970's. The two end-members causes are, on the one hand, a deep mantle plume that developed a hotspot track from the Seychelles Plateau to the Grande Comore, and, on the other hand, a lithospheric deformation that reactivated transform faults and controlled the magma path. The present work first surveys the sparse geological, geophysical and geochronological data available for this archipelago, re-evaluates the age of the magmatic activity and integrates this evolution at a regional scale. Combining realistic magma production rates, the volume of each edifice and the geochronological, it is showed that the magmatic activity started first in Mayotte about 20 Ma and second, almost simultaneously, in Anjouan, Mohéli and Grande Comore about 10 Ma ago. This magmatism, coeval with magmatic periods in areas surrounding the Mozambic channel, the southern East African rift and Madagascar, is organised in three periods since Late Oligocene. Magmatic provinces are now superimposed with seismic zones and graben structures. In consequence, the Comores archipelago is tentatively interpret as part of the East African rift rather than related to a distinct deep mantle plume.