EASTERN MEXICAN ALKALINE PROVINCE (EMAP): IMPLICATIONS OF SUBDUCTION AND INTRAPLATE RELATED TERTIARY MAGMATISM

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In Eastern Mexico, several magmatic localities stretch over 2,000 km NW-SE, roughly parallel to the laramidic folded Sierra Madre Oriental and to the Tertiary arch of the Sierra Madre Occidental. The magmatic units cut or lie over slightly deformed Cretaceous to Tertiary limy to pelitic strata. The age of the EMAP localities range from Eocene to Quaternary. The geochemical data allow to discriminate between older subduction and younger continental intraplate units. To the north predominates the subduction character, changing gradually to southern areas with well defined intraplate domains. Intermediate rocks with typical depletion in Nb-Ta prevail in the north, e.g. Candela-Moclova Belt. In Sierra de San Carlos and Sierra de Tamaulipas, farther south, the volume of the subduction related magmas decreases dramatically. The rocks there are gabbros to granites. Exotic rocks such as foidolites and carbonatites are also present. Southwards, the volcanism volume increases, where alkalibasalts evolved to trachytes and phonolites. Isotopic 143Nd/144Nd and 87Sr/86Sr determinations reveal the mantle origin of all magma types. Migration of the magmatic arch to the East, drove the generation of the subduction related magmas induced by dehydratation fluids. In a later stage, the mantle could have adiabatically reached higher levels, specially in the south of the EMAP, generating the intraplate magma. Trace elements modellings show an inhomogenoeous mantle. A rift formation, as proposed earlier, could not be confirmed.