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First palaeomagnetic results from the Kyrenia Range terrane of northern Cyprus and their implication for the regional plate tectonic evolution of the eastern Mediterranean

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The Kyrenia Range terrane of northern Cyprus is a narrow, arcuate fold and thrust belt that consists mostly of Mesozoic and Tertiary sedimentary and subordinate volcanic rocks. The lineament is dominated by a steeply dipping composite thrust pile located partly along, and partly straddling, the abrupt northward termination of crust assigned to the Troodos terrane. It preserves evidence of passive and active margin phases, the latter involving both strike-slip and thrust faulting. We have collected palaeomagnetic samples from 31 sites in pillow lava sequences of two ages (Maastrichtian and Palaeocene) exposed along the length of the range in order to determine whether the arcuate shape of the Kyrenia lineament results from relative tectonic rotations along its length, and to determine its role in the regional plate tectonic assemblage. Importantly, the igneous rocks are closely associated with pelagic limestones, providing excellent control on the original palaeohorizontal at each site.

Results may be divided into three groups: (i) westernmost sites have well-defined site mean directions of magnetization, but inter-site dispersion is high. These data require further analysis to determine whether scatter is due to large relative rotations of small-scale fault blocks or is the result of the lava sequences recording transitional field directions; (ii) Maastrichtian sites in the central Kyrenia Range that yield data of both normal and reversed polarity which pass a fold test, and which indicate no significant tectonic rotation; and (iii) Palaeocene sites in the easternmost segment of the Kyrenia Range that have normal polarity remanences that pass a fold test and indicate c. 30° CCW rotation. The difference in remanence directions between the central and easternmost sites is similar to the difference in the trend of major structures between these localities, indicating that the change in strike results from relative tectonic rotation.

Rotation of the eastern Kyrenia Range is likely to be linked to final closure of the southern Neotethyan ocean during the Miocene, resulting in collision between the Arabian continental indentor and the Tauride microcontinental blocks. We place this result into the regional framework of Late Cretaceous to Neogene tectonic rotations in the eastern Mediterranean, which has been dominated by the influence of the Arabian plate on successive phases of intra-oceanic deformation, ophiolite emplacement and collisional tectonics during progressive plate convergence.