FIELD OBSERVATIONS FROM THE CAUCASUS REGION; EVIDENCE FOR PALEOGENE TECTONIC EVENTS AT THE SOUTHERN MARGIN OF EURASIA

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The Caucasus region is located at the northern margin of the Arabia-Eurasia collision zone (Fig. 1). Cenozoic processes observed in this region provide insights into the final assembly of the Tethysides and subsequent continent-continent collision. In the Talysh and Adjara-Trialet regions of the Lesser Caucasus, thick volcano-sedimentary successions of predominantly Middle Eocene age crop out. In the Talysh, these strata are ~8 km thick and subsidence rates, constrained by Ar-Ar age data, are of the order of 0.6 km Ma⁻¹ (Fig. 2). Talysh depositional systems fed into the South Caspian Basin implying similar subsidence rates here also. The rapid deposition and volcanism in the Talysh and Adjara-Trialet regions are interpreted to result from transtensional / extensional basin formation (Vincent et al., 2005). Similar basins are scattered across much of southwest Asia and reflect the readjustments and rotations of loosely assembled microcontinental fragments and remnant oceanic basins during the final suturing of northern Neotethys, a process that was completed by the Late Eocene.

Further north, within the Western Greater Caucasus, facies, palaeocurrent, provenance and biostratigraphic evidence indicate that the core of the range became subaerial at the beginning of the Oligocene (Fig. 3). Emergence was related to a combination of tectonic uplift and sea-level fall. Late Eocene to Early Oligocene deformation and regional unconformities are recognised on both sides of the Bitlis-Zagros suture zone. This may indicate that stress began to be transferred between the Arabian plate and Eurasia at this time and provides a mechanism for Greater Caucasus uplift (Vincent et al., 2007). Further evidence for the timing and kinematics for deformation in the region between the Arabian plate and Caucasus are needed to test this hypothesis.
Figure 2. Schematic stratigraphic column through the Eocene-Oligocene part of the Azeri Talysh, with the position of Ar-Ar age data points marked (these have ±0.1 Ma errors). Paleocurrent information for each stratigraphic unit are shown shaded according to sedimentary structure type. These indicate that palaeoflow was largely to the southwest towards the present position of the South Caspian Basin. Note, however, that slump paleoflow directions are at a high angle to the general trend; these may have been generated during initial compressional deformation in the region. Palaeomagnetic north is denoted by the red arrows. From Vincent et al. (2005).

Figure 3. Outcrop map of Oligocene to Early Miocene Maykop Series sediments on either flank of the Western Greater Caucasus highlighting divergent palaeocurrent directions and olistostrome occurrences. Located on Figure 1. From Vincent et al. (2007).

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