



The Cimmerian Orogeny - a foreland perspective

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After its detachment from the northern margin of Gondwana in the early Permian, the Iran Plate, as a part of the Cimmerian continent collage, performed a rapid northward drift and finally collided with Eurasia (Turan Plate), thereby closing the Palaeotethyan Ocean. This so-called Early (or: Eo-) Cimmerian Orogeny formed the Cimmerides, a more-or-less E/W-oriented mountain belt. The Upper Triassic-Middle Jurassic Shemshak Formation of northern Iran is commonly regarded as the product of the erosional denudation of the Cimmerides, i.e. the Cimmerian foreland molasse. However, the timing of the collision of the Iran Plate with the Turan Plate is still a matter of debate (Middle Triassic to Early Jurassic) and new stratigraphical and sedimentological data from Iran cast some doubt on the traditional views. According to our integrated analyses of Upper Triassic to Upper Jurassic successions in northern Iran (Alborz Mountains, Binalud Mountains, Koppeh Dagh) and Central Iran, we developed a revised model for the Triassic-Jurassic geodynamic evolution of the Iran Plate and adjoining regions. Initial collision of the Iran Plate and Turan plates occurred around the Middle-Late Triassic boundary (Eo-Cimmerian event *sensu stricto*) and transferred the northern margin of the Iran Plate into a flexural foreland basin filled with synorogenic Carnian-Rhaetian sediments. The Carnian drowning of the syn-drift carbonate platforms along the northern margin of, and the widespread Carnian sub-aerial hiatus on the Iran Plate is related to this flexural plate deformation, followed by Norian-Rhaetian extension after the onset of north-directed Neotethys subduction below Iran. The major Eo-Cimmerian deformation and folding of the foreland (buckling) occurred at the Triassic-Jurassic boundary, followed by a rapid rise and denudation of the Cimmerian Mountains (Liassic molasse-type conglomerates). Thick deep marine

shales in the Alborz indicate a Toarcian-Aalenian extension phase in northern Iran. The sediments of the Shemshak Group, formerly regarded as the Cimmerian molasse, thus document syn- and post-collisional processes of the Eo-Cimmerian Orogeny as well as, from the Toarcian, the onset of Neotethyan back-arc rifting. This back-arc rifting proceeded zip-like eastward, more-or-less re-opening the Palaeotethyan suture. From the late Bajocian onwards, rifting extended into the Koppeh Dagh and northern Afghanistan. The mid-Bajocian Mid-Cimmerian unconformity may represent the break-up unconformity of these back-arc rift basins.