Combining structural interpretation, paleostress reconstruction, biostratigraphy, and analysis of subsidence, we propose a model of tectonic evolution of northern Iran, since the middle-late Triassic collision of the Cimmerian blocks with Eurasia (fig. 1).

In northern Iran the Eo-Cimmerian orogeny resulting from this collision is associated with a regional unconformity and a major change in sedimentation. The siliciclastic deposits of the Shemshak Formation succeeded to the early-middle Triassic platform carbonates. The most common tectonic features in the Shemshak Formation are normal faults populations. From Norian to middle Bajocian, N30°E trending extension is indicated by syndepositional normal faults. Intraformational unconformities are frequently observed, especially in the numerous fluvial channels of the lower part of the Formation and near the major normal faults. We assign this extensional tectonics to the rifting phase preceding the oceanic opening of the South Caspian Basin. Mid-Bajocian to lowermost Cretaceous Dalichai and Lar formations conformably cover the Shemshak Formation in central Alborz. The deposition of Dalichai and Lar formations is contemporaneous with the opening of the South Caspian basin. On the contrary, in easternmost Alborz and Kopet-Dagh an angular unconformity characterized the middle Bajocian (Mid-Cimmerian event). These deformations were synchronous of the orogeny known eastward in Afghanistan related to the collision of the Afghan block with Eurasia. In northeastern Iran this event, Triassic to mid-Bajocian in age, stopped the rifting in the Kopet Dagh basin.

In Alborz the boundary between the late Jurassic-lowermost Cretaceous carbonates and the overlying late Barremian to Aptian carbonates of the Tiz-Kuh Formation is a major regional angular unconformity also known in central Iran and in the Sanandaj-Sirjan zone. In the Kopet-Dagh basin, this so-called late Cimmerian phase induced a change of sedimentation, marked by the deposition of red beds issued from the erosion of the late-Cimmerian chain.

In northern Iran the lower part of the Cretaceous sequence is mainly constituted of shallow water carbonates of the Tiz-Kuh and Tirgan formations (Orbitolina limestones) in Alborz and Kopet-Dagh respectively. The base of Tiz-Kuh Formation exhibits clastic red layers of conglomerates and sandstone. Albian to Turonian deposits, still poorly known in Alborz, are part of the thick limestone bars, intercalated with volcanics, widespread in northern Alborz. The Senonian sequence is constituted of limestone and marly-limestones (Coniacian to early Campanian), overlain by Campanian to Maastrichtian marls, suggesting a deepening of the marine environment. The lower part of the Cretaceous sequence is associated with E-W to WNW-ESE trending normal fault systems associated with magmatism. These observations suggest a N-S to NNE-SSW extensional event during this period. In central Alborz the orientation of the majority of the volcanic dikes (N80°E to N100°E) associated with the Apatian to early Senonian magmatism are compatible with such a sub-meridian extension.

The Cretaceous-Palaeogene boundary is marked by a major regional unconformity. The whole pre-Palaeogene sedimentary pile, including the Palaeozoic to Late Cretaceous sequences, is unconformably overlaid with the continental red conglomerates and sandstones of Fajan Formation, considered as Palaeocene. This unconformity is related to a major inversion of the southern margin of the South Caspian and Kopet-Dagh basins. Part of folds and thrusts of the Present day Alborz range was active during this inversion.
During the early-middle Eocene the tectonic context changed in northern and central Iran. Southern Alborz is marked by the deposition of the volcaniclastic Karaj Formation, reaching 3-4 km in thickness. This sequence was deposited in relatively deep-water, evidencing a rapid subsidence of the Karaj basin. The middle Eocene Karaj Formation contains volcanics (basalts, andesites, trachy-basalts and trachy-andesites) as well as tuffs, shales, agglomerates, sandstones and conglomerates, and rare gypsum and limestones layers. Syndepositional E-W to WNW-ESE trending normal faults are common in the Karaj Formation. They are associated with a well-determined N-S to NNE-SSW extension.

We assign this extensional event to the opening of an early-mid Eocene back-arc basin that developed behind the northward subduction of the Neo-Tethyan oceanic lithosphere beneath the Eurasian margin. Arc-derived sediments eroded from the Urumieh-Dokhtar magmatic arc filled up the Karaj basin. This volcanic arc forms a distinct linear intrusive–extrusive complex, extending along the entire length of the Eurasian margin in Iran.

The first evidence of the collision between the Arabian and the Iranian plate margins is recorded by a major sedimentary break that occurred in uppermost Eocene. In south-central Alborz, the late Cainozoic continental conglomerates unconformably overlie the middle Eocene Karaj Formation. During this period, part of the present Alborz range is already emerged. Then and until Present continental molasses deposited all around Alborz, associated with the uplift of the range.

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**Fig. 1 - Schematic tectonostratigraphic evolution of central Alborz**