



Evolution of the Tethyan Seaway during the Oligocene and Miocene: Constraints from foraminiferal faunas of the Qom Formation, Iran

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The Qom Formation was deposited in the central Iranian back-arc basin during the Oligocene-Miocene and documents the closure of the Tethyan Seaway. Based on sedimentological data, various depositional models have been presented for the Oligocene-Miocene successions of central Iran, Sanandaj-Sirjan and Urumieh Dokhtar magmatic arc provinces in Iran. In this study, foraminiferal faunas were studied based on a total of 146 samples from the Molkabad section, located northwest of Molkabad Mountains, and from the Navab Anticline section, located south of Kashan area. Changes in the composition of the benthic foraminiferal fauna were used to reconstruct the paleoenvironmental evolution during deposition of the Qom Formation. The Molkabad section mainly consists of limestones, calcareous marls, marls, and gypsum-bearing marls with a total thickness of 760 meters and the Navab anticline section consists of sandstone, red shale, gypsy marl and conglomerate. The Qom Formation at both sections overlies Eocene rocks with an unconformity. The studied sediments contain a variety of red algae, bryozoans and benthic and planktonic foraminifers. The distribution of index larger benthic foraminifers in Molkabad section suggests a late Oligocene (Chattian) to early Miocene (Aquitani-Burdigalian) age, comprising the *Miolepidocyclus*-*Miogypsinoidea* and *Borelis melo curdica*-*Meandropsina iranica*-*Schlumbergerina* assemblage zones. The small benthic faunas of the Molkabad section represent typical inner-neritic depositional environments supported by the predominance of marls and algal and bryozoan limestones in this section. The preliminary bathymetric reconstruction suggests deposition of the succession in water depths commonly shallower than 50 m. The estimated values of water depth range between 36 and 94 m but the strong predominance of the genera *Ammonia* and *Elphidium* points to an even lower water depth in some intervals. For Navab anticline section the distribution of the index larger benthic foraminifers indicate a Lower Miocene (Aquitani-Burdigalian) age. The biostratigraphic zonation is consistent with existing data from other sections of the Qom formation and appears equivalent to biozones reported from the lower and upper parts of the Asmari Formation. The textural and faunal analyses allowed for the distinction of eight microfacies for the Molkabad section representing inner and middle ramp depositional environments. Eleven different microfacies were distinguished for the Navab Anticline section representing inner, middle and outer ramp depositional environments.

Key word: Qom Formation, Central basin, Oligocene-Miocene Benthic Foraminifera, Tethyan Seaway, Iran