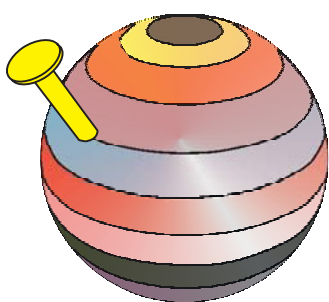


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Upper Oligocene to Lower Miocene foraminifera from the Qom Formation (Central Iran)

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The present study focuses on two Oligocene-Miocene outcrops of the Qom Formation in Central Iran located near Zefreh, about 57 km northeast of Isfahan. The Central Iran has a unique paleogeographic position for testing the biogeographic history of the Eastern Mediterranean close to the assumed gateway to the Indian Ocean in the SW. Geodynamic evolution of that pathway must have had pronounced effects on the existing fauna. The Qom Formation itself represents marine flooding of the Central Iranian Gulf and is intercalated between thick continental successions termed the Lower and the Upper Red Formation. It displays the characteristic source- and reservoir-rock in Central Iran. In consequence, precise biostratigraphic and paleoecological investigations are also of great importance for purposes of the petroleum exploration.

The sedimentary succession of the Qom Formation at Vartun is 120-m-thick and splits into 3 lithostratigraphic units. The 65-m-thick lower unit is made by yellow to yellowish, highly fossiliferous limestone interbedded with grayish to yellowish marl with abundant larger benthic foraminifera. A 30-m-thick marl follows with abundant echinoderms, mollusks, and small and larger benthic foraminifers. On top, 20 m unit of sandy to marly limestone grading into marl up-section is present. It bears abundant echinoderm and pteriomorph bivalves, but lacks any microfaunal remains. The thickness of the Qom Formation attains 85 m in the Bagh outcrop. The succession is represented there by a thick alternation of highly fossiliferous marl, and sandy to marly limestone.

Considering its microfossil content, the lower unit of the Vartun section can be attributed to the Upper Oligocene (Chattian) based on the presence of *Lepidocyclina* (*N.*) *howchini*, *Eulepidina dilatata*, and *Miogypsinoides* sp. Its middle unit belongs already to the Lower Miocene (Aquitanian to Burdigalian) as suggested by the composition of planktonic foraminifera including *Globigerinoides trilobus*, *Globigerina praebulloides*, and *Globigerinoides altiaperturae*. The abundant *Lepidocyclina* (*Eulepidina?*) *elephantina*, *Nephrolepidina tourneri*, along with the present *Miogypsina* sp. supports the inference of the Early Miocene age. Its smaller benthic foraminifera is dominated by diverse *Quinqueloculina* and *Triloculina* species pointing to installation of shallow water environmental setting.

Abundant benthic foraminifera assemblages were found at Bagh section. The smaller benthic fauna is dominated by diverse *Lenticulina* representatives, followed by *Amphistegina hauerina*, pointing to shallow water depositional settings. The intervals with common epiphytal, oxic indicators *Cibicides* sp. and infaunal, suboxic conditions tolerating *Fissurina obtusa*, and *Vaginulinopsis* sp. may point to the presence of sea-grass settling muddy bottoms. Not very abundant planktonic foraminifera includes *Globigerina praebulloides*, *G. ouachitensis*, *Globigerinoides trilobus*, *Gls. altiaperturae*, and *Gls. bollii* providing straight forward correlation with the middle unit of the Vartun section (Aquitanian to Burdigalian). This is in agreement with the composition of larger benthic foraminifera.

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