Stratigraphic, palaeomagnetic and palaeoenvironmental study of the Early Oligocene vertebrate locality of Taqah (Dhofar, Sultanate of Oman)

by J. ROGER, S. SEN, H. THOMAS, C. CAVELIER and Z. AL SULAIMANI

with 9 figures

Abstract. The Taqah terrestrial vertebrate locality, in the extreme southwest of the Sultanate of Oman at the southern margin of the Arabian Peninsula, is contained within a transgressive marine sequence (Shizar Member) that forms the basal unit of the Oligocene Aswaq Formation. Unlike the Eocene deposits, which are very monotonous and very widespread throughout the Arabian Peninsula, the Oligocene deposits are varied and much more limited in area; in Dhofar they are restricted to elongate east-west grabens that formed during the first stages in the opening of the Gulf of Aden. The Taqah locality lies within one of the grabens where the geology is complicated by large curved faults.

The Shizar Member in the Taqah area comprises a 50-m thick, predominantly clayey-sandy sequence that shows large vertical and horizontal facies variations and contains carbonate intercalations, which are best developed in the central part of the member. Although 16 sequences are recognized in the section, these fall within three main sequences (S1, S2 and S3) interrupted by a major discontinuity interpreted as being due to a rapid drop in sea level. The basal sequence (S1) begins with tidal flat deposits; the topmost deposits of sequence S2 show subtidal characteristics that indicate a prograding carbonate shelf; then the uppermost sequence (S3) marks a return to tidal flat conditions with a strong terrestrial influx, and shows an increasingly confined character, passing from intertidal to supratidal (with fossil vertebrates) to lacustrine facies.

The Shizar Member and the overlying Oligocene units have yielded a rich association of benthic and accessory planktonic foraminifera. Detailed analysis of the Oligocene biostratigraphic data in Dhofar and neighbouring regions has enabled the Shizar Member to be correlated with the Tc-Td stratigraphic interval (cf. East Indian Letter Stages) and the P18-P20 planktonic foraminifera zone (Kupelian): the vertebrate fossil layers of sequence S3 fall within the Td stage or P20 zone. A magnetostratigraphic study of the section shows a succession of eight polarity inversions that are correlated with the C13N to C11R interval of the geological polarity time scale.

On the basis of the most recent data, which place the Eocene/Oligocene boundary at 34 Ma, the age of the Taqah fossil vertebrate beds would be between 30 and 31 Ma. This result contradicts the Late Eocene age recently proposed for the whole of the Qatrani Formation of Fayum in Egypt.

Authors’ addresses: J. ROGER, C. CAVELIER, Bureau de Recherches Géologiques et Minières, Orléans-La Source, B.P. 6009, F-45060 Orléans Cedex 2, France.
S. SEN, Laboratoire de Paléontologie des Vertébrés, URA-CNRS 1433, Université P. et M. Curie, 4 Place Jussieu, F-752 52 Paris Cedex 5, France.
H. THOMAS, Chaire de Paléoanthropologie et Préhistoire, URA-CNRS 49, Collège de France, 11 Place Marcelin-Berthelot, F-75321 Paris Cedex 5, France.
Z. Al SULAIMANI, Ministry of Petroleum and Minerals, Directorate General of Minerals, P.O. Box 551, Muscat, Sultanate of Oman.

© 1993 Gebruder Borntraeger, D-1000 Berlin · D-7000 Stuttgart

DOI:10.1127/nos/28/1993/93
(c) 2015 www.schweizerbart.com

Newsletters 28 (2/3) 93-119 9 Fig. Berlin · Stuttgart, 10. 3. 1993