

Lithostratigraphy, biostratigraphy and gamma-ray spectrometry of the Cretaceous-Paleogene boundary in surface section and exploratory well in Coastal Fars, Zagros fold and thrust belt

A. Moghaddasi¹, H. Vaziri-Moghaddam^{2*} and A. Seyrafian³

1, 2, 3- Dept., of Geology, Faculty of Science, University of Isfahan, Isfahan

* hvaziri@sci.ui.ac.ir

Received: 2018/11/19 Accepted: 2019/1/8

Abstract

The aim of this study to detect the Cretaceous-Paleogene (K/Pg) boundary in Coastal Fars based on lithological and micropaleontological characteristics and also gamma-ray logs in outcrop exposure and borehole wireline. This study has been done on one surface stratigraphic section in north flank of Gavbast anticline and one exploratory well in the same region and correlation between them. A presumable interval from the top of the Gurpi and base of the Pabdeh formations with thickness of 50 m was measured where 195 samples were collected. Surface gamma-ray survey was performed a cross section by using a hand-held gamma-ray spectrometer in 30 cm intervals. To distinguish the K/Pg boundary in detail, the sampling and gamma-ray measuring interval was focused on 15 cm steps near the presumable K/Pg boundary. The sampling interval of cuttings in wildcat well at the drilling time was 2 m. The U (ppm), Th (ppm), K (%) and dose rate (nGy/h) were measured in every sampling site. The data was processed by Geolog software. Field gamma-ray was correlated with the wireline gamma-ray log from borehole by the CycloLog software. The results shows gamma radiation has wide range values (17.02 nGy/h - 81.94 nGy/h). The increasing of gamma-ray is not coincident to K/Pg boundary and this is due to high frequency of glauconite and phosphate near to K/Pg boundary. The minimum value of U is 1.36 ppm and maximum value is 13.24 ppm. The planktonic foraminifera studied and photographed under thin section and also as washed samples. 25 genera and 50 species of planktonic foraminifera have been determined. The recognized biozones are *Gansserina gansseri* Zone, and *Contusotruncana contusa* Zone indicate latest Campanian to middle Maastrichtian age for upper part of the Gurpi Formation and *Eoglobigerina edita* Partial-range Zone (P1), *Praemurica uncinata* Lowest-occurrence Zone (P2) and *Morozovella angulata* Lowest-occurrence Zone (P3) assign Danian age for lower part of the Pabdeh Formation. Due to lack of *Abathomphalus mayeroensis* Zone, *Pseudoguembelina hariaensis* Zone, *Pseudotextularia elegans* Zone, *Plummerita hatkeninoides* Zone, *Guembeliteria cretacea* (P0) Zone and *Parvularugoglobigerina eugubina* (Pα) Total-range Zone, a paraconformity between the Gurpi and Pabdeh formations in the studied area was recognized, which encompasses since late Maastrichtian till earliest Danian. Presence of glauconite and phosphate near to top of the Gurpi Formation deposits reveals a hardground. From lithostratigraphic point of view, due to lack of purple shale informal member at the base of Pabdeh Formation in Coastal Fars, the Gurpi and Pabdeh formations boundary was inferred at the low weathered marlstones beds at the base of Pabdeh Formation which comprises reworked Cretaceous planktonic foraminifera.

Keywords: Lithostratigraphy, Biostratigraphy, Planktonic foraminifera, Gamma-ray spectrometry, K/Pg, Zagros