



Recognition of microfacies and reconstruction of paleoenvironment of Jahrum Formation in East of Shiraz (SW Iran) based on larger benthic foraminifera and other microfossils

M Maleki and M Bahrami
(mary12532000@yahoo.com)

The Paleocene- Eocene Jahrum Formation is a carbonate and dolomitic carbonate sequences in Zagros Mountains. A section of this formation in East of Shiraz (south of Iran) has been selected. Jahrum Formation gradually overlies red marls of the Sachun Formation, and is overlain by red marls of Razak Formation. The Purpose of this study is: Recognition of microfacies and reconstruction of Paleoenvironment of Jahrum Formation in this section. Carbonate and dolomitic carbonate sequences of Jahrum Formation consist mainly of larger benthic foraminifera (e.g. Nummulites, Alveolina, Orbitolites and so on), along with other skeletal and non-skeletal components. The composition of associated fauna (presence of echinoids, mollusks, Corals, Brachiopods, Green algae and bryozoans), and non-skeletal grains (e.g. intraclasts and peloids) was considered. Sedimentologic texture and structure (e.g. dolomitization, presence of boring, burrowing and encrustation) have been considered qualitatively. Water depth during deposition of the formation was determined based on the variation and types of benthic foraminifera, and other components in different facies. An absence of turbidite deposits, reefal and shoal facies and other studies indicate that the Jahrum Formation was deposited in an idealized carbonate ramp environment. Due to the great diversity and abundance of larger benthic foraminifera, this carbonate ramp is referred to as a "foraminifera-dominated carbonate ramp system". Hence, larger foraminifers are excellent indicators used as valuable tools to construct palaeoenvironmental models and the sequence stratigraphic framework of Eocene rocks of the Jahrum Formation. The creation of a time framework allows us to address stratigraphic architecture topics, such as the relationships among granulometry (i.e. Nummulites of diferent sizes), depositional processes and resulting stratal geometries in a carbonate ramp system and, from an ecological point of view, the timing of the proliferation of larger benthic foraminifera during depositional sequences.

In the Jahrum Formation, seven microfacies were recognized from the deeper to the shallower part of the platform. These are as follows: Bioclast Nummulites wackestone, Rotaliid wackestone, Alveolina bioclast Nummulites wackestone and packstone, Bioclast alveolina nummulites Orbitolites wackestone and packstone, Larger agglutinate forams somalina wackestone, Miliolid bioclast wackestone and Dolostone and dolomudstone with record of fossils is the only microfacies in the tidal flat sub-environment. Microfacies studies include the analyses of matrix and grains, textural features, fossil content, petrographic and standard microfacies zone. Correlation and interpretation criteria, along with depositional model, were determined from thin sections. Measurements taken from each thin section include estimation of nummulitid and alveolinid size, as well as their test shape, because morphological characteristics of symbiont-bearing larger foraminifera tests [e.g. diameter/thickness (D/T)ratio] show variation along the palaeoenvironmental gradient (Beavington-Penney et al. 2006). The presented results are based on approximately 120 thin sections from samples collected in this section of the Jahrum Formation. Thin sections were stained using the method of Dickson (1965) to distinguish ferroan and non-ferroan calcite from dolomite. The petrographic classification for carbonates is based on Dunham limestone classification (Dunham 1962). Wilson (1975) and Flügel (2004) facies belts and sedimentary models were also used. The goals of this study are: to present the main microfacies; to interpret the depositional environment of the Jahrum Formation based on the facies, functional morphology and life style of foraminifers; and to recognize a depositional model based on the distribution of the foraminifera and other fauna and facies interpretation. The ramp model proposed here for the Jahrum Formation represents an example of a foraminifera-dominated ramp, typical of the Palaeogene.