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"Research Note"

MID-CRETACEOUS OSTRACODS FROM WEST OF KERMAN (IRAN): PALEOENVIRONMENT AND PALEOGEOGRAPHIC RELATIONSHIPS*

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Abstract – A fauna of 16 species and genera of marine Ostracoda is described and illustrated for the first time from the mid-Cretaceous of the Badamouyeh Mountain in Kerman province. The ostracod assemblage suggests a favorable condition during the deposition of the strata. The ostracods can also be used for the correlation of Cenomanian age formations in many places in the Middle East.

Keywords – Cretaceous, ostracod, Albian, Cenomanian, paleoenvironment

1. INTRODUCTION

The advantages of using ostracods in biostratigraphical and paleoecological analysis are that they are numerous, morphologically diverse, often short ranging and easily recognizable [1]. They are also sensitive to environmental factors, and therefore are among the best tools for analyzing the paleoenvironments [2]. The use of ostracods as biostratigraphical markers in the Middle East has been recognized by some workers [3-5]. In Iran, Grosdidier [6] published a detailed illustrated manual of Cretaceous species from the coastal Fars region. This is by far the most comprehensive account of the faunas to date as it covers the entire Cretaceous interval. Unfortunately, since 1973, no serious attempt has been made to identify and illustrate the Cretaceous ostracods in Iran.

This paper deals with some mid Cretaceous ostracods west of Kerman city and tries to introduce some ostracods and determine their paleoecological environment and geographic relationships.

2. GEOLOGICAL SETTING AND DETAILS OF STUDIED SECTION

Between the southwest of Ekhtiar Abad (west of Kerman city) and Chechmeh Gaz village there is a succession of Cretaceous strata which constitute the Badamuyeh Mountain. In this area a sequence of Jurassic underlies the green-marine marls, which are named, informally, honooj marls herein. The marls are overlain by a thick sequence of Santonian limestones. Figs. 1 and 2 present a simplified geological map for the study area and lithological succession of the honooj section, where the samples were taken from.

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3. METHODS OF INVESTIGATION

Ten samples were taken from the green marls close to each other. Samples were dried overnight in an oven. Approximately 500 g of dried sediments were washed through a 63 μm sieve and the residues dried and dropped through a nest of sieves The 500-1000 μm was picked in entirety and the 250-500 μm was picked to provide at least 300 ostracods.

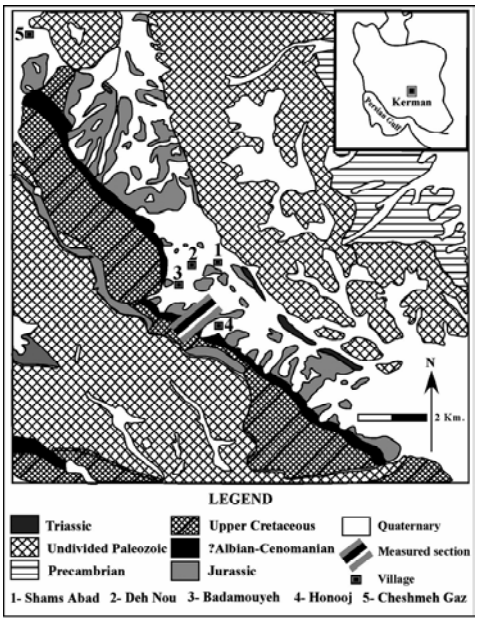

Fig. 1. Geological map of the study area

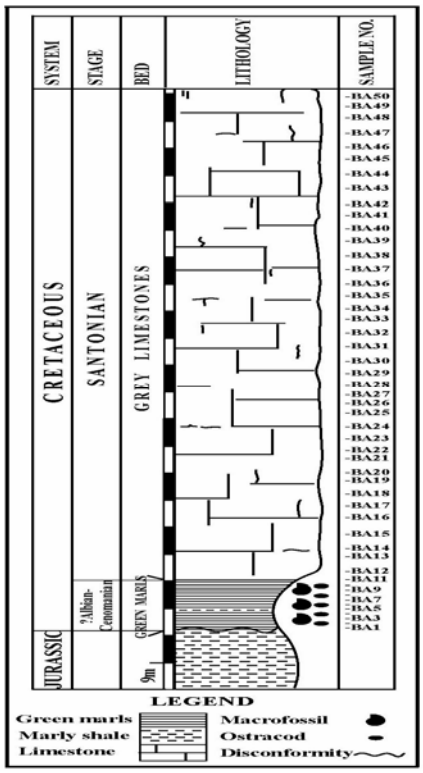

Fig. 2. Schematic lithological succession of honooj section

4. OSTRACODA RECOVERED FROM THE HONOOJ MARLS

The assemblages of ostracods consist of both platycopids and podocopids as shown below: *Cyhterella* spp. *Cytherella concava* Weaver, *Cytherelloidea ghabounensis* Bischoff, *Cytherelloidea kayei* Weaver, *Cytherelloidea* sp., *Cornicythereis* sp., *Pterygocythere diminuta* Weaver, *Pontocyprella harrisiana* (Jones), *Ilyocypris* sp., *Macrocypris siliqua* (Jones), *Paracypris* sp., *Monoceratina* sp., *Bairdoppilata* sp., *Rehacythereis* sp., *Isocythereis elongata* Weaver, *Schuleridea* sp. and *Ovocytheridea* sp. All the species and genera, except *Isocythereis elongata* and *Pterygocythere diminuta* are present throughout the green marls. The two mentioned species occur only at the top of the marls.

One form, *Ilyocypris* sp., resembles *Ilyocypris gibba* (Ramdohr) described by Muñoz and Regalado [7] from the Pliocene of Spain. It might be possible that the stratigraphic range of this species is older than previously considered, although the role of contamination cannot be ignored. All the ostracod taxa found in this study are illustrated in Fig. 3.

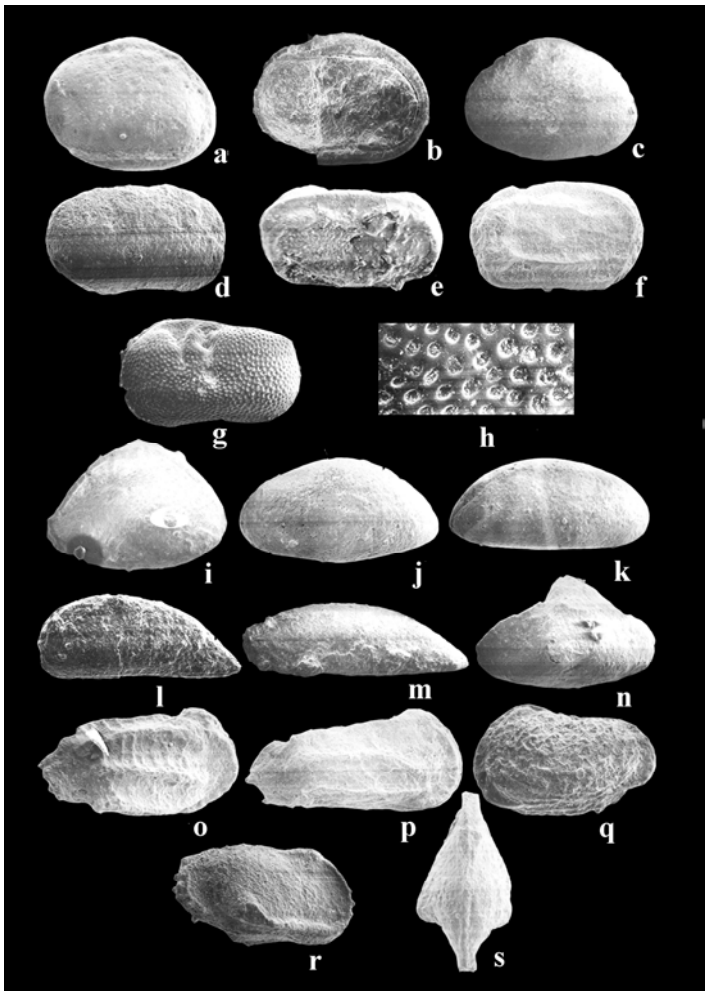

Fig. 3. Ostracods recovered from honooj marls. a, b: *Cytherella* spp. (left lateral views×50); c: *Schuleridea* sp. (left lateral view×50); d: *Cytherella concava* Weaver (left lateral view×75); e: *Cytherelloidea kayei* Weaver (right lateral view×75); f: *Cytherelloidea ghabounensis* Bischoff (left lateral view×75); g, h: ?*Ilyocypris* sp. (g, left lateral view×75; h, detail of sculpture in side view×215); i: *Bairdoppilata* sp. (right lateral view×50); j: *Ovocytheridea* sp. (left lateral view×75); k: *Pontocyprella harrisiana* (Jones, 1849) (right lateral view×75); l: *Paracypris* sp. (left lateral view ×75); m: *Macrocypris siliqua* (Jones) (left lateral view×75); n: ?*Monoceratina* sp. (left lateral view ×100); o: *Cornicythereis* sp. (right lateral view×75); p: *Isocythereis elongata* Weaver (right lateral view×75); q: *Rehacythereis* sp. (left lateral view×75); r, s: *Pterygocythere diminuta* Weaver. (r, right lateral view; s, dorsal view, both×75)

5. DISCUSSION AND CONCLUSIONS

a) Paleoenvironment

The presence of both platycopid and podocopid ostracods suggest an oxygenated environment during the deposition of the honooj marls, because in dysaerobic conditions platycopid ostracods dominate [8].

Although of the two most common living platycopid genera, *Cytherella* has been recorded commonly in bathyal and abyssal environments [9, 10], on the other hand, *Cytherelloidea* is thermophylic and is not found, even in low latitudes, anywhere but shallow depths [8]. Therefore the occurrence of different species of *Cytherelloidea* is clear evidence to conclude that a shallow and warm environment prevailed during the deposition of the strata as well. The shallow environment is also supported by low planktic to benthic foraminifera ratio.

b) Age determination

Some workers [11, 12] studied the green marls and assigned them to different ages. However this study shows that ostracod assemblages are nearly similar to that reported from the Upper Albian and Vraconian of Cameroon [13], although some of them are illustrated from the Cenomanian of some parts of Iran as well (6). Ostracod associations, joint with benthic foraminifera and macrofossils led us to assign the honooj marls to an Upper Albian to Lower Cenomanian age.

c) Paleogeographic connections

Faunal similarities are very strong during mid-Cretaceous times (Albian-Cenomanian), partly due to the strong paleogeographic connections at this time. Therefore, these ostracods may also be used as excellent index species for the correlation of Cenomanian age formations in many places of the Middle East. During the Cenomanian, the Tethys Sea covered this area where shallow to more deeper water sediments were deposited containing the same fauna [14]. This indicates the existence of similar environmental conditions and the ability of these fauna to be distributed throughout the south shelf of the Tethys Sea.

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