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Short Communication

Occurrence of Regular Echinoid from Bagh Beds, MP, India

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Abstract

Fossils from Bagh Beds of District Dhar, (M.P.) have been collected. Among them some regular echinoid fossils have been observed. Echinoids inhabited sea since late Ordovician period about 480 million years ago. They had circular profile, radial symmetry and test with tubercles. One of the collected but rare echinoids genus "Cyphosoma'' has been recorded for the first time from the new locality. The study deals about the mode of life and the environment in which they lived.

Keyword: Bagh beds, echinoid, cyphosoma.

Introduction

Echinoids play an important role for paleontologist. They are grouped as regular or irregular on the basis of oral surface, shape of the organism and location of anus. Most of the fossil echinoids from the Paleozoic era are incomplete, comprises of isolated spines and small clusters of scattered plates from crushed individuals.

Recently, during our field work at Khandlai-Rampura near Bagh town of district Dhar, MP (India), we have collected two well preserved specimens of "Cyphosoma" from nodular limestone which is reported first time in this area. The Bagh Beds contain very significant echinoid fauna and were first noticed[1]. Subsequently many paleontologists explored and described the echinoid fauna from Bagh beds[2-7]. A significant and innovative work has also been performed recently on Bagh beds[8,9].

The expeditions of Cretaceous echinoid fossils have also been recorded from other parts of the world: from Paris[10], America[11], England[12-14], United Arab[15] and also from Brazil[16].

Material and Methods

Two well preserved specimens were collected from Nodular limestone at Khandlai and Rampura, district Dhar, MP, India. The standard methodology for paleontological studies has been adopted. This includes localization of different fossiliferous areas by land records and survey of these areas has been conducted in different villages of Dhar. Stratigraphical and geological study of these fossiliferous rocks has also been performed. Fossils were collected by digging the fossiliferous area of Bagh Beds up to depth of two to three meters.

The exact location and the orientation of each fossil and position of each sediment layer in the stratigraphical sequence have been noted. Magnifying lens was used for the field study and identification of the collected genera. Fossil specimens were numbered and their details were recorded in the field note book. After returning from the field, the fossil specimens were cleaned for further confirmation of the genera by using standard lab investigations. For the paleontological studies we followed the systematic arrangements and measurement of the fossils.

The material was stored after washing with water or HCl or 10% solution of Soda or Potash as per requirement. All the fossil samples are preserved well in transparent plastic containers. For detailed anatomical information they were photographed to the scale in various postures dorsal, ventral, lateral etc. These fossils were identified and classified according to the Treatise on Invertebrate Paleontology[17,18]. The nomenclature and the sequence of the taxa followed here is in accordance with Dassarma and Sinha[7].

Results and Discussion

The specimen collected belongs to: Class – Echinoidea, Subclass – Euechinoidea, Order - Phymosomatoida Mortensen, 1904, Family - Phymosomatidae Pomel, 1883, Genus - Cyphosoma Agassis, 1840, Cyphosoma namadicum Fourtau, 1918.

Table-1
Dimensions

Specimen No.	Height of the test (mm)	Diameter of the test (mm)
S1	6	14
S2	4	12

The test of collected specimens is flattened. A pentagonal opening with interradial pentagonal angles is clearly visible in each specimen. A sunken peristome similar in size to the apical disc is also observed. The buccal notches are shallow and distinct.

The inter ambulacral zones are nearly one and a half times wider than ambulacral zones. The ambitus tapers towards the apex. Uniserial pore pairs are also visible which form distinct phyllodes. These pores are circular and none conjugated. The compound plates are predominantly quadrigeminate below the ambitus while in the lower region they become trigeminate. The compound plate bears a large imperforate and crenulated primary tubercle. These tubercles at the ambitus are confluent within each column but on adapical plates they are separated by a single horizontal row of granules. Two columns of primary tubercles are separated by a single zigzagged row of granules. Compound plates are phymosomatid in style.

Secondary tubercles are smaller and adradial in position on all plates near the peristome. Below the ambitus the secondary tubercle is largest on the interambulacral plates reaching almost two thirds the size of primary tubercle. Rings of small granules separate these large tubercles on the oral side. On the adapical surface granules are sparsely distributed above the primary tubercles. The interradial zone is narrow and naked. The primary tubercles are largest at the ambitus which gradually decrease in size both adorally and adopically. The peristome is not bordered by any primordial plates.

Figure-1
Cyphosoma namadicum: Lateral view

Figure-2
Cyphosoma namadicum: Apical view

Figure-3
Cyphosoma namadicum: Oral view

Cyphosoma namadicum was investigated earlier from Man valley of Bagh Beds[3]. Our specimens are somewhat identical to this in general shape and ornamentation but recorded from new localities i.e. from Khandlai and Rampura of Dhar district.

In the ambulacral area it has few primary tubercles extending from suture of the compound plates and going up to the boss of the tubercles. As compared to Phymosoma mongraensis, the present species is more elevated apically, have shorter pentagonal area of the apical disc and a fewer number of ambulacral plates[6].

Conclusion

The description of echinoids is based on a variety of stable characteristics including lantern structure, peristomial plating, and the arrangement of ambulacral and interambulacral plates. Cyphosoma namadicum has been explored from a new locality of Nodular limestone of Bagh Beds which forms a strong link in explaining early evolution of echinoids. Further exploration will be helpful in creating more appropriate phylogenetic tree.

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