

NEW FIBULARIID ECHINOID FROM THE MIDDLE EOCENE ROCKS OF RAJASTHAN, INDIA

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ABSTRACT

The micro-echinoids, recovered from the *Assilina* rich marl (Bandah Formation, Middle Eocene) exposed near Ramgarh, district Jaisalmer, Rajasthan, are described herein as *Echinocyamus jaisalmerensis* n. sp. within the family Fibulariidae Gray, 1855. The new species is characterised by an oval to subpentagonal test with central apical system.

INTRODUCTION

Duncan and Sladen (1884) were first to record microechinoid *Echinocyamus nummuliticus* from Eocene sediments of Sind. Subsequently, Dasgupta (1929) described *E. kamrupensis* from the Cretaceous of Assam. *E. nummuliticus* has also been described from the Eocene of Salt Range by Davies (1943). Later, Srivastava (1978) reported *Echinocyamus* (*E. polymorpha*, *E. nummuliticus* var. *bernaniensis* and *E. raoi*) from the Oligocene and

Fibularia (*F. guvarensis*) from the Miocene sediments of Kutch. Tandon and Srivastava (1980) described a new micro-echinoid *Tridium* (*T. kieri*) from the Eocene of Kutch. The genus *Salenia*, known from the Cretaceous of the Indian subcontinent only, has also been recorded (*S. tandoni*) from the Eocene of Kutch by Srivastava (1982). The specimens described in this paper were collected by one of us (UBM) in the year 1981 from the Middle Eocene rocks exposed at about 7.5 km S 80°E of Ramgarh, dis-

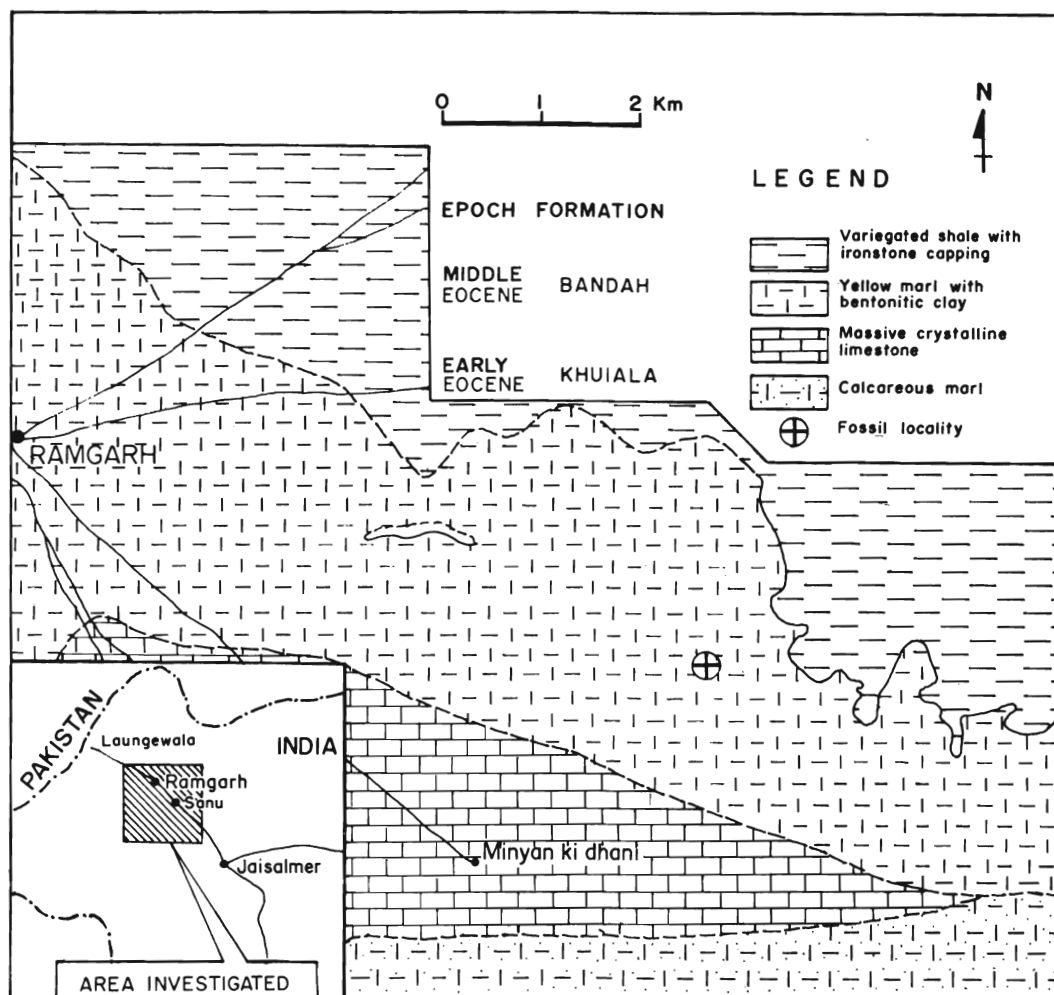


Fig. 1. Geological map of the Ramgarh Area, district Jaisalmer, Rajasthan showing the fossil locality.

trict Jaisalmer, Rajasthan (fig.1; modified after Sen and Laul, 1978-79).

GEOLOGY

The micro-echinoids were collected from the basal *Assilina* rich marl (fig. 2) which is conformably overlain by a 3 m thick yellow ochreous marl. The sediments of the area are placed under Bandah Formation (Das Gupta, 1975). The microfauna of the Bandah Formation was studied by Khosla (1973) and all the species of the larger foraminifers and ostracods of this area resemble very closely those of the Middle Eocene rocks of Kutch, Sind and Baluchistan. The classification of the described echinoids is followed after Durham (1966).

SYSTEMATIC DESCRIPTION

Order *Clypeasteroida* Agassiz, A, 1872

Suborder *Laganina* Mortensen, 1948

Family *Fibulariidae* Gray, 1855

Genus *Echinocyamus* van Phelsum, 1774

Echinocyamus jaisalmerensis n. sp.
(Pl. I, figs. 1 - 9)

Holotype : G.S.I. Type No. 20684.

Material : Eleven specimens, well preserved.

Etymology : The species has been named after the district Jaisalmer, Rajasthan from where the specimens were collected.

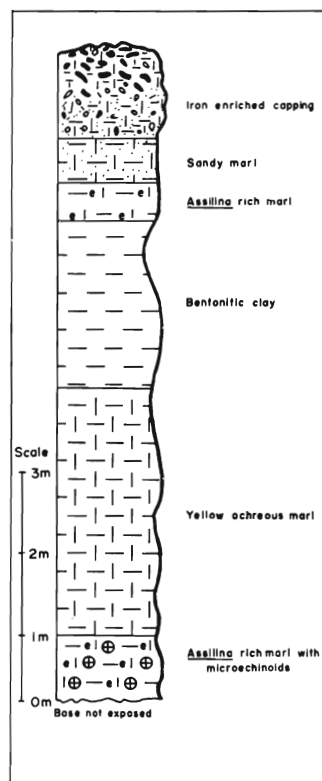


Fig. 2. Stratigraphic section exposed at 7.5 km S 80°E of Ramgarh

Type locality : 7.5 km S 80°E of Ramgarh, district Jaisalmer, Rajasthan.

Type horizon : Bandah Formation (Middle Eocene).

Repository : Geological Survey of India, Calcutta.

Diagnosis : Test small, oval to subpentagonal. Apical system central, at the highest point of the test. Ambulacra subpetaloid to straight and open; ambulacrum III longest and broadest, I & V shortest and have the width of II & IV. Peristome circular (with serrated margin) to subpentagonal. Periproct infra-marginal, longitudinally oval to circular and lies about mid-way between peristome and the posterior ambitus. Internal partitions radiating, ten in numbers.

Description : Test small, oval to subpentagonal, broadly rounded posteriorly and slightly protruded anteriorly. Aboral surface slightly convex and oral surface concave. Apical system monobasal, small, central at the highest point of the test; genital pores 4, small, circular and are almost of same size; two anterior genital pores are closer than the posterior ones. The genital pores surround a madreporic plate which has a small, circular madreporic pore situated between the genital pores 2 and 3. Ambulacra five, subpetaloid to straight, open, do not reach up to the ambitus and flush with the test. Ambulacrum III is longest and broadest; I and V are shortest and have the same width as that of II and IV. Poriferous zones consist of non-conjugate, rounded to oval, obliquely placed pore pairs of same size. Small accessory pores present near the junction line of coronal plates. Internal partitions ten. Peristome large, central in a depression and circular (with serrated margin) to subpentagonal in shape. Periproct smaller than peristome, infra-marginal, longitudinally oval to circular and lies about mid-way between peristome and the posterior ambitus. The test is ornamented with non-perforated and non-crenulated tubercles which are present in small circular scorbicules. These tubercles are more on the oral surface than the aboral surface.

Remarks : The new species is close to *Echinocyamus raoi* Srivastava described from the Middle Oligocene rocks of Kutch in shape but differs from it in lacking transversely oval periproct, shortest, narrowest ambulacrum III and longest ambulacra II and IV.

The new species resembles *Echinocyamus nummuliticus* var. *planus* Duncan and Sladen described from the Kirthar Series of Sind by Duncan and Sladen (1884) but differs from the latter in having central apical system and same width of paired ambulacra. Further, the Sind variety is more elongate than the new species.

Echinocyamus jaisalmerensis, n. sp. also differs from *Echinocyamus polymorpha* (Duncan and Sladen) described by Kier (1957) from the Karkar Series (Middle Eocene) of Somaliland in its oval to subpentagonal test and non-elevated (flush) ambulacra. Moreover, the species of Somaliland has its periproct situated near the posterior ambitus, while in the present species it lies at

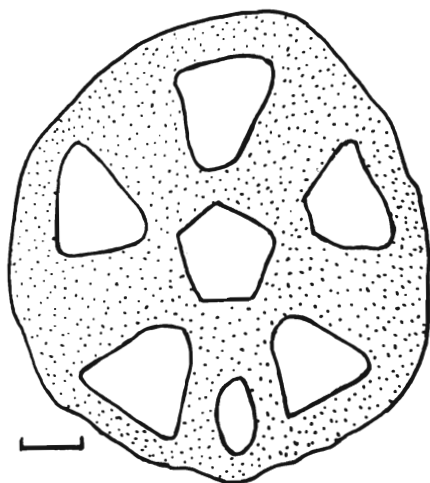


Fig. 3: The Line diagram of Traverse section of a microechinoid showing internal partitions. (Bar scale represent 1.0 mm).

about mid-way between the peristome and the posterior ambitus.

The new species also differs from *Echinocyamus polymorpha* (Duncan and Sladen) described from the Kirthar Series of Sind by Duncan and Sladen (1884) in lacking circular test, conjugate pores of the poriferous zone and possessing true madreporite.

Variation : A thin section of one of the specimens under study has shown only five internal partitions instead of ten partitions characteristic of *Echinocyamus* (fig. 3). The author is of the opinion that such specimens as (having five partitions should be kept under a separate) genus because the number of internal partitions is a generic character and varies from genus to genus in the family Fibulariidae. The creation of a new genus is presently not justified as it is not possible to

make detailed observations on limited material available in the present collection.

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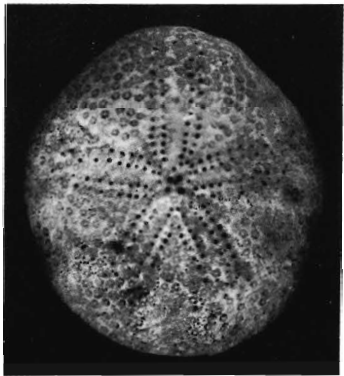
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EXPLANATION OF PLATE

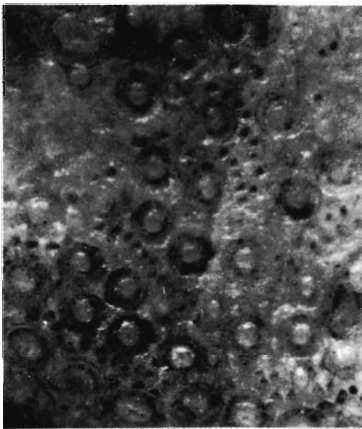
PLATE I

(Scale : Bar represents 0.5 mm)

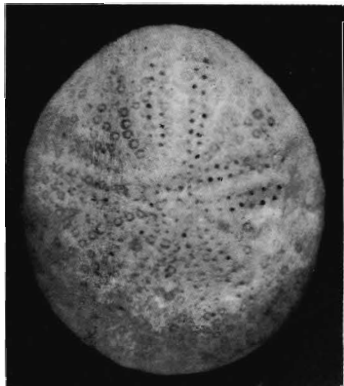
- 1: *Echinocyamus jaisalmerensis* n. sp.; aboral view showing subpentagonal test. G.S.I Type no. 20684.
- 2: *Echinocyamus jaisalmerensis* n. sp.; aboral view showing apical system and ambulacral petals. G.S.I Type no. 20684.
- 3: *Echinocyamus jaisalmerensis* n. sp.; oral view showing subpentagonal test. G.S.I Type no. 20684.
- 4: *Echinocyamus jaisalmerensis* n. sp.; part of the test showing tubercles and accessory pores. G.S.I Type no. 20684.
- 5: *Echinocyamus jaisalmerensis* n. sp.; thin section of the test showing basicoronal plates. G.S.I Type no. 20686.
- 6: *Echinocyamus jaisalmerensis* n. sp.; basicoronal plates enlarged. G.S.I Type no. 20687.
- 7: *Echinocyamus jaisalmerensis* n. sp.; aboral view showing oval test. G.S.I Type no. 20685.
- 8: *Echinocyamus jaisalmerensis* n. sp.; aboral view showing apical system, ambulacral petals, and test. G.S.I Type no. 20685.
- 9: *Echinocyamus jaisalmerensis* n. sp.; oral view showing oval test. G.S.I Type no. 20685.



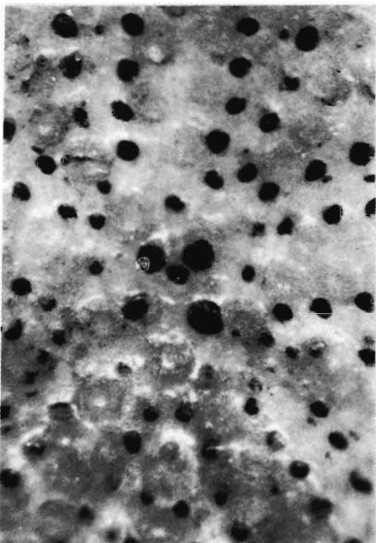
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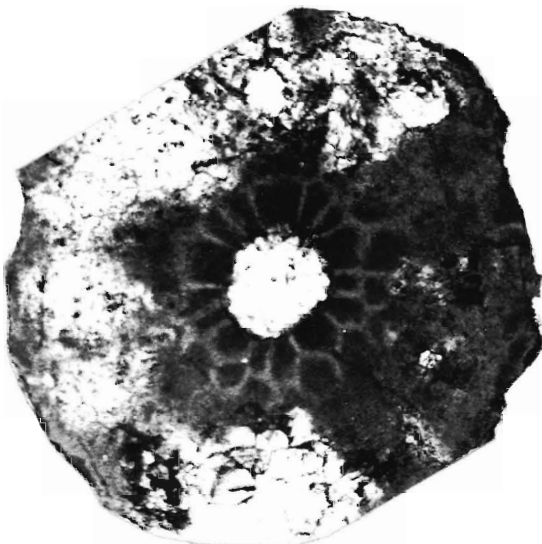
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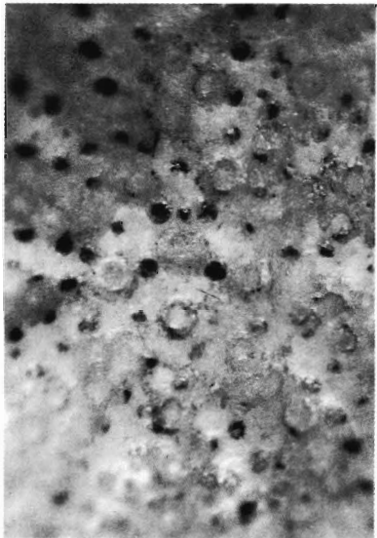
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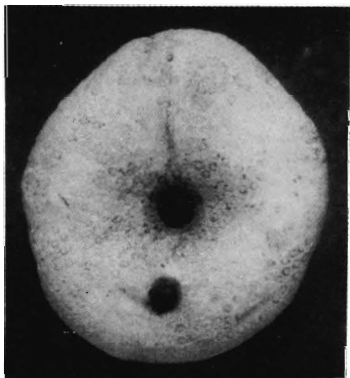
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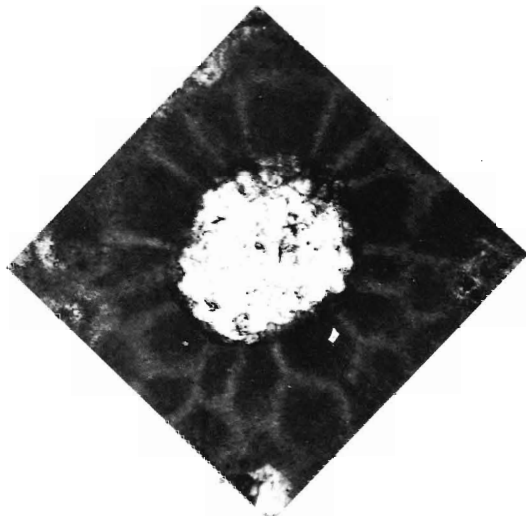
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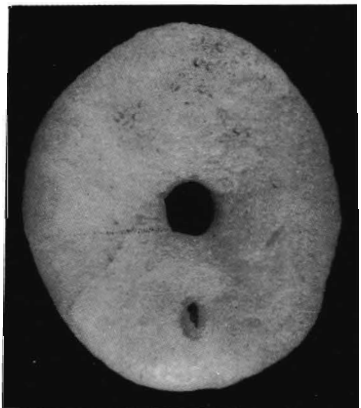
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