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A NEW GENUS AND SPECIES OF THE CLYPEASTEROID ECHINOID FROM THE MIDDLE EOCENE ROCKS OF KUTCH, INDIA

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ABSTRACT

The micro echinoid, *Tridium kieri* gen. et sp. nov. is described from the Middle Eocene rocks exposed in south-western Kutch, India. The new genus, while possessing a prominent denticulated flange around peristome, is very distinct from all other known clypesteroid genera in having three genital pores in the apical system.

INTRODUCTION

A remarkable micro echinoid is recorded and described from the rocks of Middle Eocene age exposed around Guvar (23°38′10″ : 68°32′30″), Jhadwa (23°30′30″ : 68°36′30″), Panandro (23°41′ : 68°45′05″) villages and Ratchelo nala, a place about 3.2 kilometres south of Baranda (23°34′20″ : 68°43′10″) village, Kutch, India and is referred to a new species and genus. *Tridium* gen. nov. was found in the *Nummulites beaumonti* Zone of Tandon (1976).

The new genus *Tridium* has continuous interambulacra which terminates near apical system by a single plate (Fig. 1). It has 15 basicoronal plates (Fig. 2) and the apical system has apices opposite to the interambulacra. The posterior margin of the test is neither dentate nor digitate. On the basis of these distinguishing characters it is clear that *Tridium* gen. nov. belongs to the suborder Laganina.

Tridium may be assigned with much reservations to the family Fibulariidae, but the presence of the three genital pores in the apical system tends to suggest that the genus should be placed in a new family. At present, the erection of this family does not appear to be tenable, unless a detailed study of the present genus and allied forms is done.

SYSTEMATIC DESCRIPTION

Order Clypeasteroida A. AGASSIZ, 1872
Suborder Laganina MORTANSEN, 1948
Family New (?)
Genus *Tridium*. gen. nov.

Type species : *T. kieri* Tandon and Srivastava, sp. nov.

Diagnosis : Test small, globular to sub pentagonal ; apical system monobasal with three genital pores ; ambulacra petaloid with simple plates (Fig. 1), pores of pore pair non-conjugate and obliquely placed ; peristome in a pentagonal to circular depression and is surrounded by a denticulated flange ; periproct inframarginal ; food groove and internal support absent; accessory pores numerous

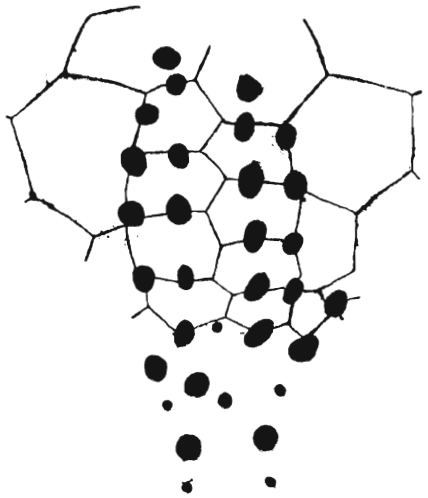

Fig. 1. *Tridium kieri* Tandon and Srivastava, gen. et sp. nov. Camera lucida drawing showing plate arrangement in ambulacrum III, × 25.0 (semi diagrammatic).

Remarks : *Tridium* gen. nov. resembles to some extent with the fibulariids but differs in not having four genital pores and open ambulacra. It differs from the laganids in lacking food grooves, open ambulacra and internal supports. The described genus also differs from the neolaganids in having three instead of four genital pores and lacking pseudocompound plate in the ambulacra.

Type locality : Near Guvar, Kutch, India.

†Deceased, January 15th, 1978

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Type horizon : *Nummulites beaumonti* Zone, Middle Eocene.

Etymology : The generic name is derived from the unique morphological character (the three genital pores) present in the apical system.

Tridium kieri Tandon and Srivastava, sp. nov.

(Plate I—1-6)

Material and Preservation : 375 specimens, majority of them are well preserved. No female was found.

Holotype: Specimen No. K 651, Paratype nos. K 652 and K 653.

Diagnosis : The new species is characterised by its posteriorly pointed test and a slight groove at the anterior end ; centrally situated apical system ; equal sized petaloid ambulacra with simple plates and rhomboid terminal interambulacral plates.

Description : Test globular to sub-pentagonal, small, have slight groove at the anterior end and pointed posteriorly ; it is longer than broad and broader than high, the highest point lies at the apical systems ; apical system monobasal, almost central and small ; genital pores three in number (G 2 missing), circular in shape ; the posterior genital pores are slightly larger than the anterior one and are comparatively widely spaced ; ocular plates small, five in number, almost triangular in shape and each plate is perforated by a single small circular pore almost at the centre ; single, madreporic pore circular and lies at the centre of the apical system ; ambulacra five, petaloid, almost of equal size and reaching about half the length of the test ; pores of pore pair have equal size, circular in shape, non-conjugate and placed obliquely ; accessory pores numerous; interambulacra terminates with almost a rhomboid single plate near the apical system ; oral surface flat ; peristome circular, almost central or slightly excentric anteriorly and surrounded by a prominent denticulated flange which in turn is surrounded by a pentagonal to circular depression ; buccal pores five pairs and each pair lies adjacent to each ambulacra ; basicoronal plates, consisting of 10 ambulacral and 5 interambulacral plates (Fig. 2), form a pentameral star ; food groove and internal support absent ; periproct inframarginal, smaller than peristome, longitudinally oval and lies between 1st and 2nd pair of coronal plates ; the test is ornamented with perforated and crenulated small tubercles which are placed in circular scrobicules.

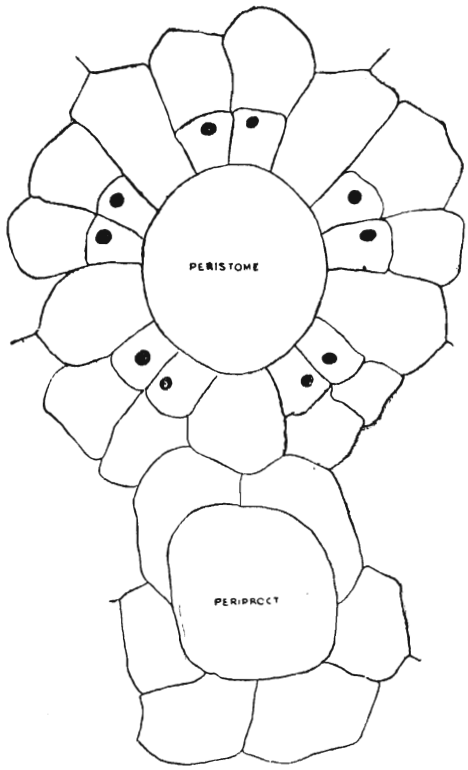


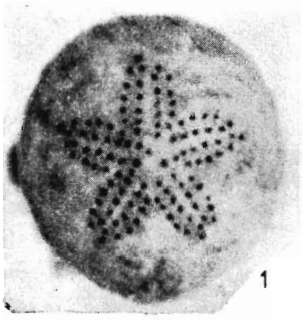
Fig. 2. *Tridium kieri* Tandon and Srivastava. gen. et sp. nov. Camera lucida drawing showing plate arrangement around peristome and buccal pores, × 37.0 (semi diagrammatic).

Table 1—*Tridium kieri* Tandon and Srivastava, gen. et sp. nov. Diamensions of ten specimens in mm.

Sl. No.	Specimen No.	Length	Breadth	Height	L : B : H
1.	K 654	2.00	1.90	1.50	1.0 : 0.95 : 0.75
2.	K 655	3.70	3.40	3.00	1.0 : 0.92 : 0.81
3.	K 656	2.60	2.45	2.25	1.0 : 0.94 : 0.86
4.	K 657	4.40	3.90	3.50	1.0 : 0.88 : 0.79
5.	K 658	3.00	2.80	2.40	1.0 : 0.93 : 0.80
6.	K 659	3.45	3.25	3.00	1.0 : 0.94 : 0.86
7.	K 660	2.70	2.45	2.25	1.0 : 0.90 : 0.83
8.	K 661	2.95	2.50	2.25	1.0 : 0.85 : 0.76
9.	K 662	2.55	2.30	1.90	1.0 : 0.90 : 0.74
10.	K 663	2.70	2.60	2.35	1.0 : 0.96 : 0.86

Table 2—*Tridium kieri* Tandon and Srivastava, gen. et sp. nov. Measurements of the Holotype. All readings in mm.

Length of the test	3.75
Width of the test	3.35
Height of the test	3.00
Diameter of anterior genital pore	0.30
Diameter of posterior genital pore	0.35
Distance between anterior and posterior genital pores	0.55
Distance between posterior genital pores	1.25
Max. diameter of peristome	0.77
Min. diameter of peristome	0.725
Max. diameter of periproct	0.50
Min. diameter of periproct	0.50
Distance between peristome and periproct	0.47
Distance between periproct and post. margin of the test	0.50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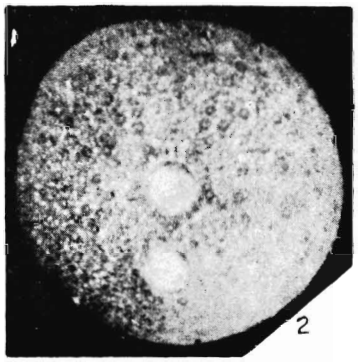
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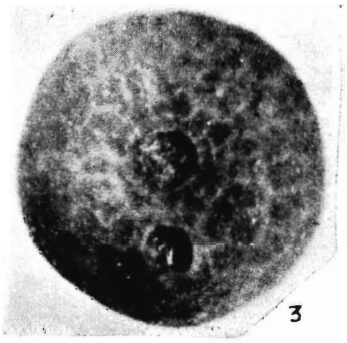
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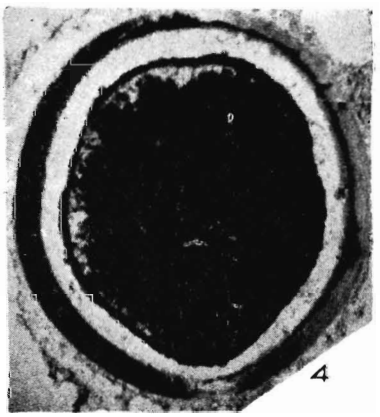
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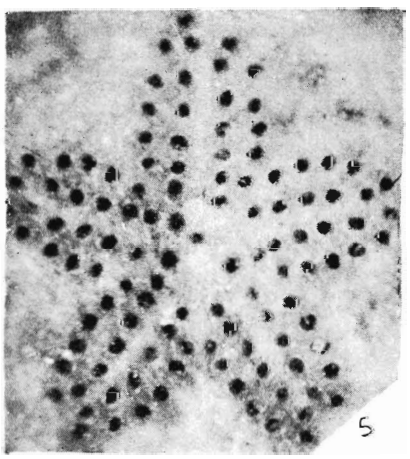
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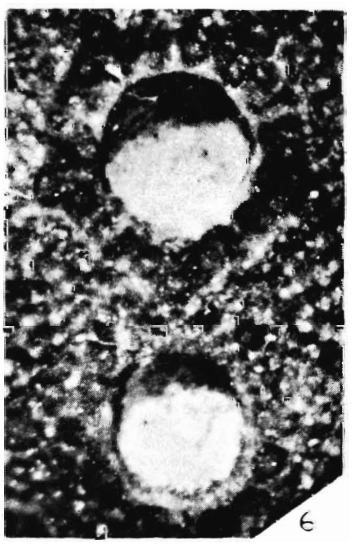
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Type locality : Near Guvar, Kutch, India.

Type horizon : *Nummulites beaumonti* Zone, Middle Eocene.

Repository : The holotype and the paratypes are deposited in the Museum, Department of Geology, Lucknow University, Lucknow-226007.

Etymology : The species has been named after Prof. P. M. Kier, Director, National Museum of Natural History, Smithsonian Institution, Washington, D. C. 20560 (USA).

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EXPLANATION OF PLATE

PLATE I

Tridium kieri Tandon and Srivastava, gen. et sp. nov.

1. Aboral view of the holotype. × 12.0 (approx.)
2. Oral view of the paratype no. K 653 × 12.0 (approx.)
3. Oral view of the paratype no. K 652 × 10.0 (approx.)
4. Transverse section of the test. × 12.00 (approx.)
5. Apical system and ambulacra of the holotype. × 25.0 (approx.)
6. Peristome and periproct of the paratype no. K 653. × 35.00 (approx.)