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Taxonomic Placement of a Holectypoid Echinoid Genus Srivastava and Singh, 2001

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Abstract

A holectypoid echinoid recorded as indeterminate genus and species by Srivastava and Singh (2001) from the sediments of middle Eocene exposed near Bermota, Kachchh (Gujarat), India is redescribed and identified as *Amblypygus pentagonalis* Duncan and Sladen, 1883.

Introduction

Srivastava and Singh (2001) recorded an unnamed holectypoid echinoid from the sediments of the Fulra Limestone Formation (middle Eocene) exposed about five km northeast of Bermota village (68^0 36' 10": 23^0 28' 05"), district Kachchh (Gujarat), India (Fig. 1). Subsequent observations on the specimen of this indeterminate form showed its affinity with the genus *Amblypygus* L. Agassiz, 1840 (Wagner and Durham, 1966; Smith, 2008). The present note redescribes this form as *Amblypygus pentagonalis* Duncan and Sladen, 1883.

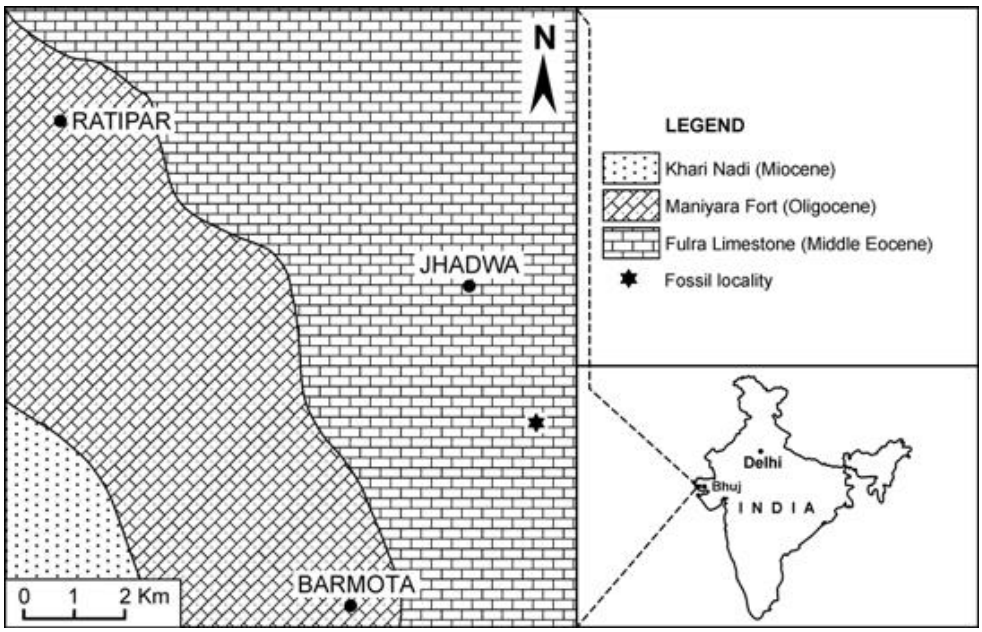

Fig. 1: Geological map of Kachchh (part) showing fossil locality (after Biswas and Raju, 1973)

The present study examined the previously described taxa recorded by Srivastava and Singh (2001) from the Fulra Limestone Formation (Middle Eocene) exposed in the vicinity of the Bermota village, southwestern Kachchh. Because of limited observations and experience, earlier the specimen could not be assigned to

any genus and species and thus named in open nomenclature. Here a detailed description and new illustrations are provided, allowing identification as *Amblypygus pentagonalis* Duncan and Sladen, 1883. Associated with this species are bivalves (*Corbula* sp., *Ostrea* sp.), gastropods (*Turritella* sp., *Dentalium* sp.) and other echinoids such as cassiduloids (*Echinolampas*) and spatangoids (*Schizaster* and *Meoma*). The foraminiferal fauna associated (*e.g. Nummulites perforatus*, *Truncorotaloides topilensis*, *T. rohri* and *Orbitilinoides beckmanni*) indicate a late Lutetian-Bartonian for the Fulra Limestone Formation.

Systematic Palaeontology

Order **Echinoneioida** Jensen, 1982
Suborder **Echinoneina** H. L. Clark, 1925
Family **Echinoneidae** Agassiz and Desor, 1847
Genus ***Amblypygus*** L. Agassiz, 1840
Amblypygus pentagonalis Duncan and Sladen, 1883
(Fig. 2. a-f)

Indeterminate genus Srivastava and Singh; Srivastava and Singh, 2001. p. 32, pl. III, figs. 1-4.

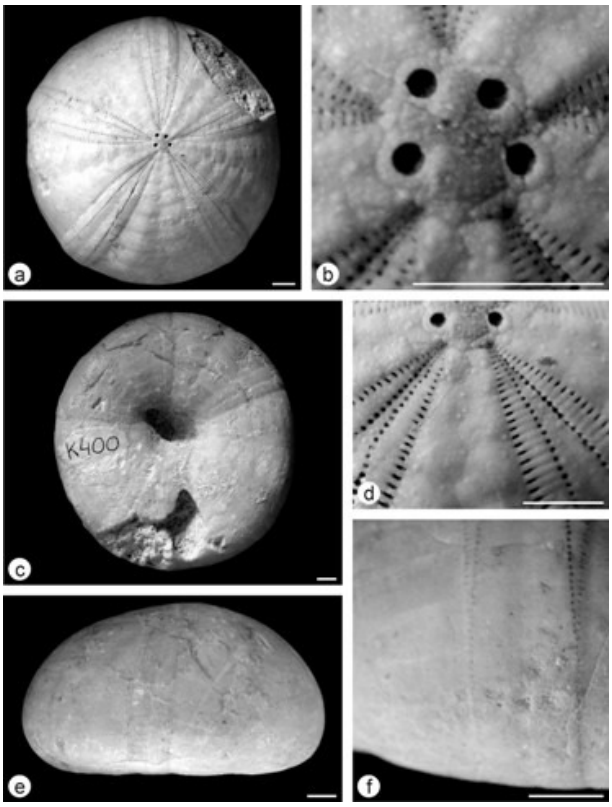

Fig. 2: a-f *Amblypygus pentagonalis* Duncan and Sladen, 1883 (Scale bar = 5.0 mm), Specimen No. LUGD/I/2029; a. Aboral view; b. Apical disc with joined oculars 1 & 5; c. Oral view; d. Petals I & V showing plates and conjugate pores of poriferous zones; e. Lateral view; f. Petal V near ambitus.

Material: One specimen (No.LUGD*/I/2029) (*Lucknow University, Geology Department).

Description: Test large, sub-pentagonal in out line, depressed, dome shape with steep anterior and posterior slopes; maximum width levels with the tips of petals II & IV. Apical system central, small, compact, tetra basal. Genital plate 2 extends posteriorly separating genital plates 1 and 4. Genital pores small, rounded and have almost identical diameter; the anterior genital pores are closer than the two posterior ones. Ocular plates five in number, small, quadrangular in shape except I and V which are longer than broad, rectangular in shape and touching each other; each ocular plate is perforated by a very small circular ocular pore. Ambulacra petaloid to sub-petaloid and slightly rose from the surface of the test; petal III is narrowest and smallest while petals I & V are longest and broadest. The poriferous zones are well developed and increase in width from apex, maximum in the middle and gradually close near the ambitus; the inner pores are small, circular and arranged in a straight linear series whereas the outer ones are elongate transversally (elongate anisopores). These pore pairs are conjugated with a transverse grooves. Ambulacral plates are pseudo-compounding, consisting of simple and demiplates. The periproct lies inframarginal and is longitudinally oval with its maximum diameter larger than that of the peristome. The peristome excentric anteriorly, is triangular in shape, obliquely placed along the 2-V direction and lies in a depression. The imperforate, crenulated tubercles are densely placed on the oral surface while these are scarce on the aboral surface.

Measurement (in mm): Specimen No. LUGD/I/2029
Length of the test: 75.1
Breadth of the test: 70.0
Height of the test: 40.0

Ratio between length, breadth and height: 1.0 : 0.93 : 0.53

Petal	Length	Breadth
III	42.0	9.5
II & IV	44.0	10.0
I & V	45.0	11.0

Maximum diameter of peristome: 14.5
Minimum diameter of peristome: 7.5
Maximum diameter of periproct: 18.5
Minimum diameter of periproct: 9.0

Remarks: Earlier, Duncan and Sladen (1883) recorded *A. pentagonalis* from the Nummulitic sediments of Kachchh (Kirthar of Grant, 1840 and Wynne, 1872) and now it has been reported from the sediments Fulra Limestone Formation (middle Eocene) exposed near Bermota, Kachchh, India. The present specimen, however, differs from *A. pentagonalis* Duncan and Sladen, 1883 in having a test with steeper anterior and posterior slopes and an apical system with oculars 1 & 5 touching each other. *A. pentagonalis* Duncan and Sladen, 1883 resembles to *A. americanus* Desor, 1858 described from the Miocene sediments of Caribbean and the United States (Cooke, 1959) but it differs from *A. americanus* in having more steeper anterior and

posterior slopes of the test (dome shape) and by the position of the periproct. The periproct is close to the posterior ambitus in *A. pentagonalis* whereas, it lies at midway between the posterior ambitus and the peristome in *A. americanus*. This shifting of the periproct in *Amblypygus* may be attributed to the ontogeny and evolution, as the case in the *Echinocymus* where the periproct shifts from the posterior ambitus towards the peristome in the geologically younger forms. *Locality*: About five km northeast of Bermota village, Kachchh (Gujarat), India. *Horizon*: Fulra Limestone Formation (Middle Eocene).

Repository

The described specimen (No. LUGD/I/2029) has been deposited in the Museum of the Centre of Advanced Study in Geology, University of Lucknow.

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