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Some Palycepod Fossils from Chorgali Formation, Nurpur Area, Central Salt Range, Pakistan

N. IQBAL, A. YASEEN, R. LASHARI**, P. USMANI**, AND N. AHSAN***,

Pakistan Museum of Natural History, Garden Avenue, Shakar Parian, Islamabad, Pakistan
Corresponding author: Rafiq. A. LASHARI, email: r_lashari@yahoo.com, Cell: 92-3332628758.

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Abstract: The Palycepod fossils were collected from basal marly beds of the Chorgali Formation (locally known as Bhadrar Beds) of Early Eocene age, exposed at the Central Salt Range, Pakistan. For this, the exposed lithological section was measured and number of samples has been taken. Paleontological studies indicate nine genera *Venus sp., Chama sp., Loxocardium sp., Cardilia sp., Megalodon sp., Mya sp., Ostrea sp., Spondylus sp.* and *Solemyia sp*. of the pelycepod belonging to nine different families, five orders and three sub classes.

Keywords: Chorgali Formation early Eocene.

1. INTRODUCTION

The Salt Range forms the southern border of the hydrocarbon bearing Potwar basin in northern Pakistan, along the northwestern margin of the Indo-Pakistani plate (Sameeni, 2009). The Eocene rocks exposed in the Salt Range are divided from base to top into Nammal Formation, Sakesar Formation and the Chorgali Formation respectively. The nomenclature of the Eocene succession in the Salt Range as accepted by the Stratigraphic Committee of Pakistan (Fatmi, 1973) **(Table -01)**.

The term "Chorgali beds" of Pascoe (1920) has been formalized as Chorgali Formation by the Stratigraphic Committee of Pakistan. The formation also represents the "Passage beds" of Pinfold (1918) in the Attock area, "Bhadrar Beds" of Gee and Evans (In Davies and Pinfold 1937) in the Salt Range and "Lora Formation" of Latif (1970a) in the Hazara area.

AGE	FATMI (1973)	DAVIES and PINFOLD (1937)
Lower Eocene	Chorgali Formation	Bhadrar Beds
	Sakesar Formation	Sakesar Limestone
	Nammal Formation	Nammal Limestone and Shale

The Eocene rocks exposed in the Salt Range are mainly the limestones, marls, clays and shales and highly rich in well preserved fossils. The fossil pelycepod were collected from Chorgali Formation locally known as Bhadrar Beds. The present collection was carried out from the basal beds of Chorgali Formation which consists of mainly soft marl and argillaceous limestone, located about one kilometer east to south-east of the Nurpur village, Salt Range **(Fig. 1)**.

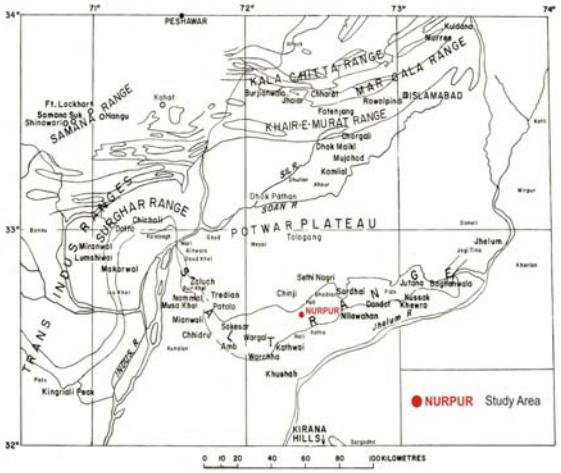

Fig.1. Map showing location of the study area in Salt Range, Pakistan (After Shah, 1980).

The fossils of Cephalopods, Gastropods, Pelycepods, Echinoderms and Foraminifera are common in these beds. Nine fossils of Pelycepod were selected to carry out the present studies. The fossils were washed and cleaned in the water, dried, labeled and preserved in the reference collection of the Earth Sciences Division at PMNH. Each fossil was measured according to its height and breadth. The generalized lithological log of the area with the position of the Pelycepod fossils from the Chorgali Formation is given in **(Fig. 2)**.

2. MATERIAL AND METHODS

PREVIOUS WORK

Several workers reported the presence of various fauna from Chorgali Formation such as,

**Centre for Pure and Applied Geology, University of Sindh, Jamshoro
***Institute of Geology, University of the Punjab, Quaid-i- Azam Campus, Lahore- 54590 Pakistan

Pinfold (1918), Davies (1926, 1930), Gee and Evans (in Davies and Pinfold, 1937), Eames (1952), Gill (1953), Iqbal (1969a, 1972) and Baqri *et al.,* (1997). Iqbal (1969) described some Tertiary pelycepod and gastropod fauna from Drug, Zindapir, Vidor (D. G. Khan), Jhalar and Chharat (Distt. Attock). Iqbal (1972) also worked on some Paleocene bivalve and gastropod fauna from Jherruk- Lakhra- Bara Nai (Sind). Fatmi (1973) reported the presence of mollusks fauna from Chorgali Formation. Shah (1977) described the Chorgali Formation and stated an Early Eocene age on the basis of fauna. Baqri (1997) worked on gastropods in the Central Salt Range.

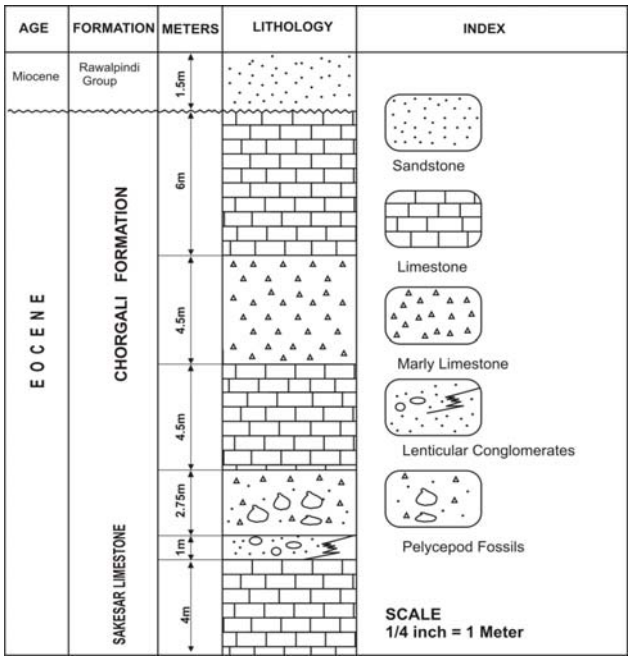

Fig.2. The generalized lithological map of the Chorgali Formation in Nurpur area, Salt Range, Pakistan.

SYSTEMATIC PALEONTOLOGY

The identification of each Pelycepod fossil up to genus level was carried out after detailed taxonomic study and measurement as follows.

Venus sp. (Linnaeus, 1758) **(232/95, Fig 3a)**

Description

Phylum Mollusca
Class Pelycepod
Sub- Class Heterodonta
Order Veneroida
Family Veneridae

The specimen has thick, oval, convex, ornamented with concentric lamellae shell. Margins of valves are finely crenulate. Ligament is external and prominent. Pallial sinus is short and angular. The dimensions of the figure are: height $4^{//}$ and Breadth $2^{//}$.

Chama sp. (Linne, 1758) (52/94, Fig 3b)

Description

Sub- Class Heterodonta
Order Veneroida
Family Chamidae

The specimen has thick, irregular shell, inequivalve, fixed by the umbo of the large valve. Umbones are spiral or sub- spiral. Surface is with concentric lamellae or spines. The fixed valve is larger and much deeper than the other. The dimensions of the figure are: height $1.3^{//}$ and Breadth $2^{//}$.

Loxocardium sp. (Cossman, 1886)
(191/95, Fig 3c)

Description

Sub- Class Heterodonta
Order Veneroida
Family Cardidae

The specimen is nearly equal lateral, posterior margins, slightly truncated ribs are noticed. Hinge is short and straight. The dimensions of the figure are: height $1.7^{//}$ and Breadth $2.4^{//}$.

Cardilia sp. (Deshayes, 1835)
(227/95, Fig 3d)

Description

Sub- Class Heterodonta
Order Veneroida
Family Cardiliidae

The specimen has thick, convex, oval, generally inequalvelant shell. Surface is with well marked radiating and concentric grooves. Hinge line is straight. The dimensions of the figure are: height $1.3^{//}$ and Breadth $2.1^{//}$.

Megalodon sp. (Sowerby, 1827)
(184/95, Fig 3e)

Description

Sub- Class Heterodonta
Order Hippuitoida
Family Megalodontidae

The specimen has thick, equivalve, convex, smooth shell with concentric lines. Umbones are prominent and curved forwards. Ligament is external and long. The dimensions of the figure are: height $1.5^{//}$ and Breadth $1.9^{//}$.

Mya sp. (Linnaeus, 1758) (183/95, Fig 4a)

Description

Sub- Class Heterodonta
Order Myoida
Family Myidae

The specimen has oblong shell, gaping at both ends particularly at the posterior. Left valve is little smaller than the right. Surface is filled with concentric ridges. External ligament is thin. The dimensions of the figure are: height $0.7^{//}$ and Breadth $1.3^{//}$.

Ostrea sp. (Linnaeus, 1758) (234/95, Fig 4b)
Description

Sub- Class Pterimorphia
Order Pterioida
Family Osteridae

Shell with lamellar structure, irregular, inequivalve and slightly inequilateral. Left valve is convex. Right valve is concave or flat and often smooth. The dimensions of the figure are: height 1.4// and Breadth 2.8//.

Spondylus sp. (Linne, 1758) (252/95, Fig 4c)
Description

Sub- Class Pterimorpha
Order Pterioida
Family Spondylidae

The specimen has irregular shell with straight hinge lines and the surface with radiating ribs. Right valve is larger and more convex than the left. The dimensions of the figure are: height 1.0// and Breadth 2.7//.

Solemyia sp. (Lamarck, 1818) (175/95, Fig 4d)
Description

Sub- Class Cryptodonta
Order Solemyoidae
Family Solemyidae

Fossil specimen has elongated oval or sub- rectangular and compressed shell. Umbones level with hinge margin, placed well towards posteriorly end of the shell. The dimensions of the figure are: height 1.7// and Breadth 2.4//.

3. CONCLUSIONS

1. The Chorgali formation of Eocene age exposed in the Nurpur area have abundant Pelycepod fossils in the basal marly beds. The Pelycepod fossils include nine genera, Nine families, five orders and three sub- classes.

2. An abundant food was available for these to enable them to grow.

3. These animals died due to the regression of the Tethys Sea as a result of the uplifting of the Himalayas.

4. Statistical study of size distribution will always be of interest to paleocological analysis.

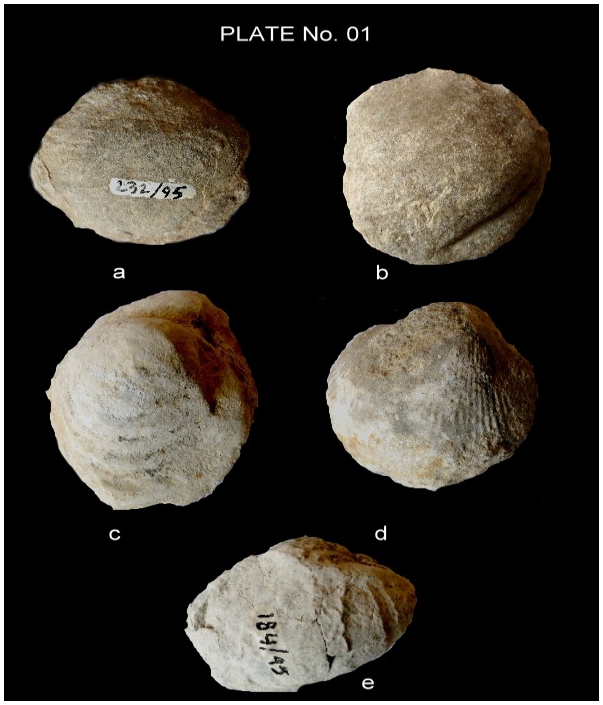

Fig. 3 (a) Venus sp. (232/95), (b) Chama sp. (52/94), (c) Loxocardium sp. (191/95), (d) Cardilia sp. (227/95) and (e) Megalodon sp. (184/95).

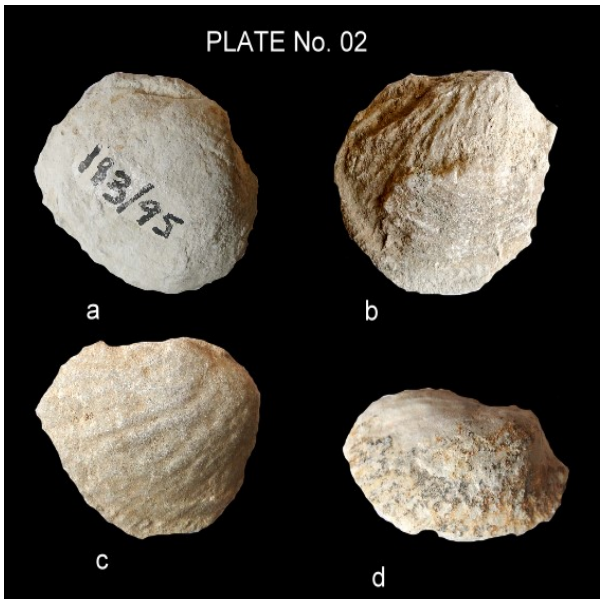

Fig. 4 (a) My asp. (183/95), (b) Ostrea sp. (234/95), (c) Spondylus sp. (252/95) and (d) Solemyia sp. (175/95).

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