TWO NEW SPECIES OF SHARK TEETH FROM GAJ BEDS OF MATANUMARH, KUTCH

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ABSTRACT — *Carcharius feddeni* and *Galeocerdo gajensis*, two new species of shark teeth, have been described from the grey gypseous shales assigned to the Gaj beds from Matanumarih, Kutch.

INTRODUCTION

THE present paper deals with two fossil shark teeth assigned to the genus *Galeocerdo* (Müller & Henle) and *Carcharius* Cuvier. These have been procured from the grey-coloured gypseous shales occurring in the neighbourhood of the village Matanumarih (23°33': 68°58') on the Matanumarih-Kotada roadside, south-western Kutch. The shales are fossiliferous, and the abundance of gypsum indicates desiccation of sea, probably under lagoonal conditions with the development of high salinity. These are undoubtedly of Lower Miocene (Gaj series) age as concluded from the association of *Ostrea angulata*. The material was collected by the junior authors during the months of February-March 1964.

The present collection contains two well-preserved teeth along with several other broken specimens, which might be referable to different genera and species. There are also broken pieces of vertebrae and fin-rays.

The X-ray photographs of the teeth have also been prepared, which reveal the internal structure of the specimens. X-rays were passed through the specimens from a distance of 1 foot at 60 kilovolt peak and 10 milliamperes. Agfa normal plates were used as sensitive material with 3/4 second exposure.

PREVIOUS WORK

Fossil fish remains from India and adjacent countries have been described from time to time by Lydekker (1886), Noetling (1901), Murray Stuart (1909-10) and Hora (1936, 1937, 1938, 1939 and 1953). However, in recent years Misra (1947) prepared and published a 'Check List' and 'Key' for the identification of fishes in India, which are of profound importance for workers on fossil fishes. Similarly, Menon (1951) has given the distribution of fossil fishes, and suggested their bearing on palaeogeography of India.

In 1959 Tewari described from the Lower Miocene beds of Vinjhan *Carchariolamna heroni* Hora originally described from the Balasore beds of Orissa. In the same paper a new species, *Hypropriion horai* Tewari, was also described from the basal Lower Miocene beds from Waior in Kutch. In this paper, he suggested that on the basis of occurrence of these shark teeth from the undoubtedly Lower Miocene beds of Kutch and also from the Baripada beds the latter formations are most likely of Miocene age, and most certainly contradicted the Eocene age for these beds as assigned earlier.

Rao (1956) in a paper entitled "The skull of an Eocene Silurid fish from Western Kutch, India", which was published at the end of 1956, described a new species, *Aurius kutchensis*, from the gypseous shales of Narenda, Kutch, and assigned the beds to Lower Eocene age.

SYSTEMATIC DESCRIPTION

Class Pisces
Subclass Elasmobranchii
Order Plagiostomata
Suborder Selachioidei
Family CARCHARIIDAE
Genus CARCHARIUS Cuvier
*Carcharius feddeni* n. sp.
Plate 1, figs. 1, 2, 5

The species has been based on the study of a single well-preserved large tooth. It is
somewhat triangular in shape. The crown is somewhat shining and obliquely pointed posteriorly. Its external surface is flat, while the internal surface is convex. The median part of the crown is thick and the edges are thin and serrated from the base of the crown to almost up to the apex, which is pointing. The anterior edge is gently convex with the largest serrations near the apex of the crown and smallest near the root. Posterior end is a little more curved and concave. The largest serrations here again are near the apex and the smallest near the base. There are no lateral denticles.

There is a narrow root with insignificant bifurcation. The internal surface of the root has a median vertical groove.

The X-ray photograph shows the remnant of pulp cavity at the base of the crown, and another small cavity in the middle of the crown.

Locality — It has been obtained from the grey-coloured shales of Miocene age near Matanumarh in Kutch.

Association — Numerous specimens of *Ostrea angulata* have been found associated with the specimen.

Remarks — There is a single specimen, which is well preserved. It is quite distinct from *Carcharias tricuspidatus* (Günthar), which is unserrated on the margins and has lateral denticles (Francis Day, 1958, p. 713, Pl. 186, fig. 1).

However, the present specimen has some resemblance with *Carcharias acutidens* (Müller & Henle), but the latter is little more erect as compared to the present specimen (Francis Day, 1958, p. 713, Pl. 189, fig. 1).

The upper teeth of *Carcharias gangeticus* (Müller & Henle) Günthar resembles the present specimen in the shape of the crown, but the root of *C. gangeticus* is undivided (Francis Day, 1958, p. 715, Pl. 187, fig. 1).

The upper teeth of *Carcharias sorrah* (Müller & Henle) Günthar resembles somewhat the present form, but it is distinct from it in being almost erect (Francis Day, 1958, p. 714, Pl. 185, fig. 1).

The present form has close resemblance with *Carcharias menisorrah* (Müller & Henle) Günthar, but differs in the details of serrations and the shape of the tooth (Francis Day, 1958, p. 716, Pl. 184, fig. 1).

The species has been named after late Dr. Fedden, the pioneer worker on the geology of Kutch.

Repository — The holotype No. L.U. 210 is kept in the museum of the Geology Department, Lucknow University.

**Family CARDHARIDAE**

Genus GALECERDO (Müller & Henle)

Galeocerdo gajensis n. sp.

Plate 1, figs. 3, 4, 6

The present study is based on an isolated single and well-preserved tooth obtained from the Gaj beds, occurring in the vicinity of Matanumarh, Kutch. It is an obliquely triangular tooth about 16-0 mm. long and 11-3 mm. high. The crown and the base are clearly demarcated, the former having somewhat shining surface with both edges serrated. The outer surface of the crown is flattened, while the inner surface is convex. The median part of the crown is thick, while the edges are thin. The posterior end of the crown is somewhat deeply notched with the largest serrations in the proximity of the notch, which gradually become smaller and smaller towards the posterior end. The anterior edge of the crown has a gentle curvature with the largest crenulations in the middle, which become smaller at the anterior and proximal end, while the serrations rapidly become minute towards the crest of the crown, which is pointed.

The root is broadly bifurcate and fairly large. It is convex on the internal surface, almost flat on the external surface and is separated from the crown by about 1 mm. broad elevated collar. It is dark brown in colour. The internal surface of the root has a small median and vertical groove.

From the X-ray photograph which is, however, not very satisfactory, hollowness of the crown cannot be clearly made out.

Locality — The tooth was collected from grey-coloured shales about 2 miles south-west of Matanumarh on the Matanumarh-Kotada roadside in Kutch. The shales have been assigned to Lower Miocene age.

Association — Numerous specimens of *Ostrea angulata* have been found associated with the tooth.

Remarks — The specimen resembles *Galeocerdo aduncus* Agassiz described from
the Miocene (Molasse), but it differs from the latter in the nature of crenulations on the anterior end, which are more pronounced in the present species. In addition to this, there is a general dissimilarity in the shape of the crown and base of the two species.

The present species also resembles *Galeocerdo rayneri* (Gray), but the latter tooth is notched externally above the base (Francis Day, 1958, p. 718, Pl. 187, fig. 3).

It is quite distinct from *Galeocerdo tigrinus* (Ranzani) in which the denticulations at the base of each cusp are also serrated (Francis Day, 1958, p. 718).

The species has been named after the Gaj formations of Kutch.

Repository — The holotype No. L.U. 211 is kept in the museum of the Geology Department, Lucknow University.

ACKNOWLEDGEMENT

The authors wish to express their appreciation to Dr. R. C. Misra, Professor and Head of the Department of Geology, Lucknow University for laboratory facilities. They are also thankful to Shri R. N. Verma for his help in the collection of the material and to Shri Ashok Kumar for his general assistance.

REFERENCES


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EXPLANATION OF PLATE 1

1. *Carcharius feddeni* n. sp. View of the external side of the tooth, showing denticulation on the crown and its flat external surface. Matanumah, Kutch. ×2·5.

2. *Carcharius feddeni* n. sp. View of the internal side of the tooth, showing its convex internal surface. ×2·5.

3. *Galeocerdo gajensis* n. sp. View of the external side of the tooth, showing its flat external surface. ×3·5.

4. *Galeocerdo gajensis* n. sp. View of the internal side of the tooth. ×3·5.


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