SOME MIOCENE VERTEBRATES FROM CEYLON

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ABSTRACT—The paper records additional fishes, reptiles and mammals from the *Malu member* of the Miocene of Ceylon.

The Tertiary beds of Ceylon were assigned to two facies namely the Jaffna limestone which is calcareous and the Minihagalkanda beds which are areno-argillaceous. The paleontology of both was only known from various marine invertebrates (Wayland et Davies 1923). The first record of Miocene vertebrates was from the north-west of Ceylon when a number of marine fish fossils were described from what was termed the *Malu deposit* (Deraniyagala 1937, 1958). The other vertebrates occurring in association at this same site were fragmentary fossils of Miocene age of a land tortoise, a marine turtle and a cetotheriid whale (Deraniyagala 1967). Fossils of six Elasmobranchs and three bony marine fishes that frequent estuaries and ascend rivers, together with those of a terrapin and a dugong that occurred in association with them, are here added to the above list. The *Malu deposit* is located at 8° 17′ north 79° 49′ east, to the west of Arna Kallu and extends southwards from the mouth of the Kala river for four miles. It is a "member" of the "*Jaffna stage*" of the Miocene of Ceylon and is shaly conglomerate containing marine, estuarine and terrestrial vertebrate fossils in association with marine and estuarine invertebrates. Block faulting or horsting appear to have produced both the row of islands off this coast and the uniserial row of elevated ridges extending along the coast that is almost parallel to the islands. The presence of fossils of the bivalve *Arca granosa* both upon the summit of Arna kallu at 230 feet above mean sea level, and in the estuarine deposit at sea level near the stream Lunu Äle at the base of this ridge, indicates that both are portions of one and the same estuarine deposit, and that at least a part of the elevation of Arna kallu had occurred during the Quaternary,

The Chondrichthyes here listed were identified mainly by reference to Hooijer's paper on Celebes fossils (1954); for the identification of some of the others see Deraniyagala (1937 and 1967).

I am grateful to Dr. Remington Kellogg of the Smithsonian Institute, Washington for expressing his opinion on the sketch and measurements that I sent him of the holotype of *Mioceta bigelowi* that "it agrees most closely with a posterior cervical vertebra of some late Tertiary whale bone whale of the Cetotheriidae", I also thank the various people who assis-

ted me in collecting the specimens that are described in this paper. Most of the 'type' specimens are in my possession, but the 'types' of the fishes that I had described in 1937 are in the British Museum of Natural History.

The measurements of all the species described in this paper are in millemetres unless otherwise stated.

Class : CRUSTACEA

Order : DECAPODA

Family : LEUCOSIDAE

Leucosia unidentata lankae Deraniyagala

Class : CHONDRICHTHYES

Order : SELACHI

Suborder : GALEOIDEA

Family : ISURIDAE

Isurus glaucus (M. et H.)

Family : CARCHARINIDAE

Galeolamna gangetica (M. et H.)

Hemipristis serra (Agassiz)

Galeocerdo cuvieri (le Sueur)

Order : BATOIDEA

Family : MYLIOBATIDAE

Myliobatis sinhaleyus Deraniyagala

Family : DASYATIDAE

Trygon sinhaleyus DERANIYAGALA

Class : OSTEICHTHYES

Order : ACANTHOPTERYGII

Family : SCARIDAE

CHRYSOPHRYS MIOLANKAE Deraniyagala

Posterior jaw teeth hemispheroid. Holotype tooth 10 long, 9 wide, 3 deep.

LABRODON SINHALEYUS Deraniyagala

Pharyngeal teeth with some larger than the others and with hemispheroid, convex, external surfaces. Length of a tooth 5, width 3.

Family : LABRIDAE

LABRODON ANGUSTIDENTATUS Deraniyagala

Pharyngeal teeth subequal, elongate, ellipsoid, Length of a tooth 3, its width 0.75.

Class : REPTILIA

Order : TESTUDINATA

Family : EMYDIDAE

Genus : GEOEMYDA Gray

GEOMYDA STRIATA Deraniyagala

Known only from the Holotype which is a marginal from behind the apex of the left inguinal sinus. Dorsal surface covered with seven striae from the peripheral and also seven from the posterior margins of this bone. Ventral aspect smooth. Length at periphery 32, anterior width 24, greatest thickness 15, the larger striae are 4 apart from one another. Estimated straight length of carapace 250.

Family : TESTUDINIDAE

Genus : MIOTESTUDO Deraniyagala 1967

MIOTESTUDO IBBA Deraniyagala

Holotype the right humeral arch comprising marginals and a part of the first costal plate. The marginals are reverted to from an angle of about 110 with the costal. The carapace was probably strongly domed; its estimated straight length is about 500.

Family : CHELONIIDAE

Genus : MIOCARETTA Deraniyagala 1967

MIOCARETTA LANKAE Derniyagala

The marginals free from costals and each of the former comprises three osseous elements. This species is known from two marginals which are fused together and a third which is from another animal. The marginals are of unusual thickness. The holotype marginals are a 22 long fragment of one fused with a 60 long complete, penultimate marginal in which the greatest height is 47, its posterior thickness 30. This marginal contains two pits for two rib tips. Estimated straight length of carapace 1,300.

Class : MAMMALIA

Order : SIRENIA

Family : DUGONGIDAE

Genus : MIODUGONG Deraniyagala

Miocene dugongs with the antero-posterior length of the squamosal shorter than the width of the azygos parietal. Genotype *Miodugong brevicranius*.

MIODUGONG BREVICRANIUS Deraniyagala

The *Holotype* is the posterior part of the cranium comprising the parietal and squamosal bones. The width of the exposed dorsal surface of the parietal is 29. Its estimated total width is 78, the bilateral thickness of the squamosal is 27. The height from the lower margin of the squamosal up to the top surface of the parietal table is 81. The paratype is a section of a rib which is of compact bone. It is 132 mm long, its dorsi-ventral diameter is 19 mm its antero-posterior one is 27, estimated total length of animal about 1800.

Order : CETACEA

Suborder : MYSTICETOIDEA

Family : CETOTHERIIDAE

Genus : MIOCETA Deraniyagala 1967

Tropical cetotheriid whales that frequente inshore and estuarine waters genotype *Mioceta bigelowi*.

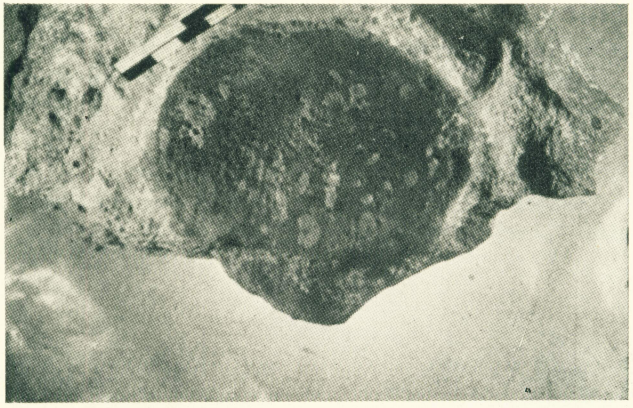
MIOCETA BIGELOWI Deraniyagala

This cetotheriid whale is known from a sixth cervical, a thoracic, a lumbar and a posterior caudal vertebra that are probably from different individuals. The *Holotype* is the sixth cervical vertebra (Pl.1, fig.1). Its centrum is 35 long, its anterior face is 65 high 86, wide. The lumbar vertebra contains two lateral processes each possessing a broad base which extends throughout almost the entire length of the centrum. Both processes had been broken off (Pl. 1, fig. 2). The length of the centrum is 120, the diameter of each of its terminal surfaces is 117, the centrum of the caudal vertebra is 32 long, its bilateral width is 82 and its dorsi-ventral depth is 73, estimated total length of whale 5500.

EXPLANATION OF PLATE 1

Two vertebrae of *Mioceta bigelowi* which is the first cetotheriid whale to be recorded from southern Asia. Both fossils are embedded in the compact shale matrix.

1. The holotype, a sixth cervical.
2. A lumbar vertebra.



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REFERENCES

DERANIYAGALA, P. E. P., 1937, Some Miocene Fishes from Ceylon. *Spolia zeylanica* **20** (2), 355–368, text figs. 9.

———, 1958, *The Pleistocene of Ceylon*. **58**, plates pp. 10, 11 and pp. 165, pl. 1. Colombo Museum publication.

DERANIYAGALA, P. E.P., 1967, Some New Miocene Vertebrates from Ceylon. *Proc. 23rd Ann. Sess. Ceylon Ass. Advanc. Sci.*, pt. 1. Abstracts, p. 50.

HOOIJER, D., 1954, Pleistocene Vertebrates from Celebes IX. Elasmobranchii. *Proc.* Ser. B. **57** No. 4. *Konik. Nederl. Akadem. van, Westeschapen Amsterdam.*

WAYLAND, E. J. ET DAVIES, A. M., 1923, The Miocene of Ceylon *Quart. J. Geolog. Soc. Lond.* **79** : 577–602.