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Available online at [www.ijit.webs.com](http://www.ijit.webs.com)**Research Article****OBSERVATION OF ENDANGER MARINE MAMMAL (*DUGONG DUGON*) ALONG THE WEST COAST OF INDIA****J.S.YOGESH KUMAR\*, V.T.NASEEF\*, D.THIYAGARAJAN\*, M.SONI GUNJAN\*, BELIM IMTIYAZ\* P.GOVINDHARAJAN\*, CH. SATYANARAYANA<sup>2</sup> AND K. VENKATARAMAN<sup>1</sup>***\*Zoological Survey of India, Coral Transplantation and Restoration project - Gulf of Kachchh, CCF Office complex, Vansankul, Jamnagar-361001.**<sup>1</sup>Zoological Survey of India, M-Block, New Alipore, Kolkata – 700053.**<sup>2</sup>Zoological Survey of India, (II Floor) Fire Proof Spirit Building, Indian Museum Complex, 27 Jawaharlal Nehru Road Kolkata - 700 016.***ABSTRACT**

The residual population of the dugong in the Gulf of Kachchh, Marine Protected Area is today the most vulnerable marine mammals in this region. The present study of the dead female animal of dugong is discussed here. The dugong (2.85 meter length) collected from the Mithapur coast Marine Protected Area. The detailed examination of morphological characters and description are presented in this Manuscript.

**KEY WORDS** *Dugong dugon*, Marine Protected Area, Mithapur, Gulf of Kachchh, West Coast.

**INTRODUCTION**

Sea cow (Genus *Dugong*) is member of the family Dugongidae and it is one of the four surviving species in the order Sirenia. It is the only existing species of herbivorous marine mammal. Dugong's distribution coincides with the existence of seagrass beds, calm, nutrient rich, protected bays and shallow islands. The seagrass family *Potamogetonaceae*, *Hydrochaitaceae* and *cymodoceaceae* are the major food of the dugong. They inhabit coastal regions, along both sides of Africa, across southern Asia and the Indo Pacific, across the western Atlantic from South America to Florida (Gohar, 1957; Bertram and Bertram, 1973). These habitats are still available in Indian major reef regions of Gulf of Mannar, Palk Bay, Andaman and Nicobar Islands and Gulf of Kachchh. Average size of the dugong in Indian water is about 2.5 meter (Singh, 2003).

In India dugong reported on eighteenth century by naturalists like Muller, Lacepede and Erxleben from different parts of the Indian Ocean. Owen (1838) reported detailed anatomy of the dugong and Annandale (1905, 1907) reported an account of the identity, external features and habitats of the Indian dugongs and also its osteology. The natural history and the economical importance of dugong were reported by Prater (1928). Pocock (1940) accounted in detail the skeleton of dugong. The distribution, abundance and habits of dugongs were point out by Jones (1959, 1966, 1967a, b).

Bertrarn and Bertram (1973) investigated the relative abundance, level of exploitation and use of dugong in its distributional range in the Indo – Pacific region. Kumaran (2002) reviewed marine mammal of India.

Dugongs were noted by different researches at different locality in Gulf of Kachchh (Moses, 1942; Jones, 1959; Mani, 1960; Silas, 1961; Mohan, 1963; Frazier and Mundkur, 1990; and Singh et al., 2003). It is commonly called Bau Manas, Suwar Machi and Lilli at Gulf of Kachchh. Most of the observations are dead once, the present observation also very recently dead specimen at Mithapure coast, Marine National Park, Jamnagar. The detailed measurement made and preserved the animal in the fisheries Research Station under Junagath agriculture university Okha following Heinsohn (1981). In this manuscript reports detailed examination of endanger marine mammals (*Dugong*) from Gulf of Kachchh. The photos have made by a Sony DSC-T200 digital camera. A systematic and detailed description is given below.

**Kingdom** : Animalia  
**Phylum** : Chordata  
**Subphylum**: Vertebrata  
**Class** : Mammalia  
**Order** : Sirenia  
**Family** : Dugongidae  
**Genus** : *Dugong*  
**Species** : *Dugong dugon* Muller, 1766

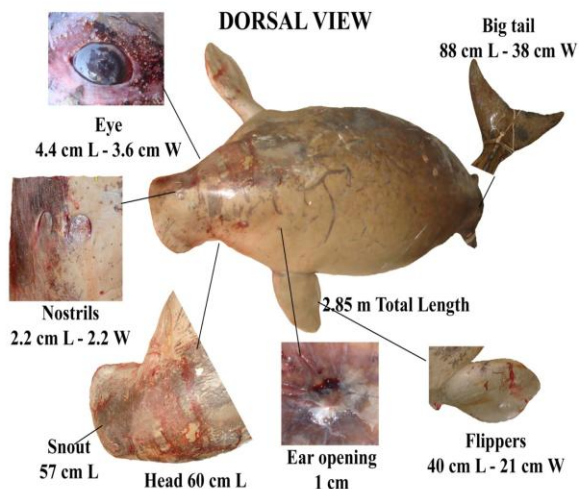
**MATERIAL OBSERVED:** Dead female dugong; 650 kg from Mithapur coast (Lat. 22<sup>o</sup> 24.127 N, Long. 069<sup>o</sup> 12.496 E)

**MATERIAL EXAMINATION (L – Length; W – Width; M – Meter)**

**DORSAL SIDE (Plate – 1)**

Total animal - 285 cm L; Head – 60cm L; Head girth – 116 cm; Neck girth – 178 cm; Maximum girth (between the genital and Umbilicus) – 192 cm; Eye – 4 cm L., 3.6 cm W; Between two eyes – 32cm L; Nostrils – 2.2 cm L & W; Total nostrils – 6 cm L; Snout – 57 cm L; Snout to eye – 32 cm L; Snout to ear – 40 cm L; Snout to nostrils – 12.5 cm L; Eye to nostril – 19 cm L; Ear opening – 1cm; Umbilicus girth – 188 cm; Annul girth – 120 cm; Flippers - 40 cm L; 21 cm L; Head to flipper – 57 cm L; Big tail - 88cm L; 38 cm W.

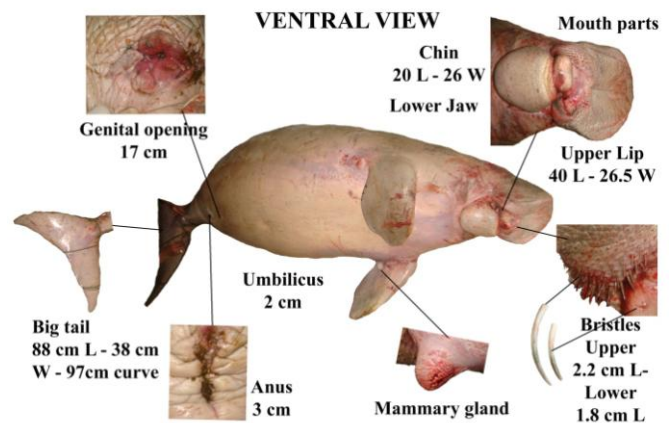
**Fig 1: Dorsal view of Dugong**



**VENTRAL SIDE (Plate – 2)**

Total animal – 274 cm L; Chin - 20 cm L - 26 cm W; Upper lip – 40 cm L - 26.5 cm W; Mouth gap – 26.5 cm L; Anterior flippers – 41 cm L; Posterior flippers- 34 cm L; Flipper – 40 cm L; 21 cm L; Mammary gland - 5 cm L; Mammary gland girth – 13 cm; Between two Mammary glands – 49 cm; Flipper to mammary glands – 2.5 cm; Genital opening - 17 cm L; Tail stock girth – 58 cm; Big tail – 88cm L - 38 cm W; Tail curve – 97 cm; Anus – 3 cm; Upper lip to anal opening – 189 cm L; Upper lip to Genital – 178cm L; Upper lip to Umbilicus opening – 120cm L; Umbilicus opening – 2 cm; Upper Bristles – 2.2cm; Lower bristles – 1.8cm.

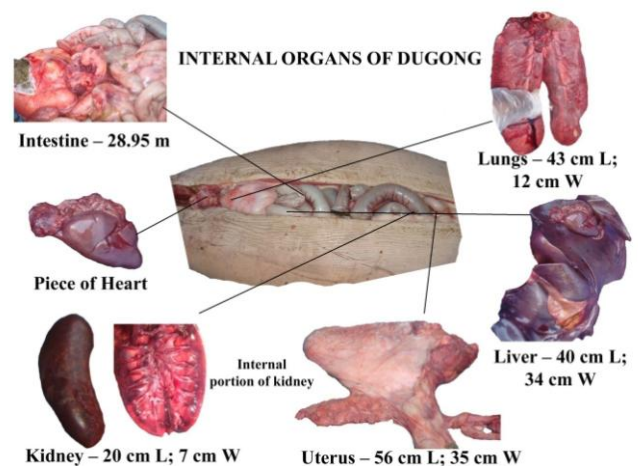
**Fig 2: Ventral view of Dugong**



**INTERNAL ORGANS (Plate – 3)**

Epidermis layer – 0.4 cm; Dermis layer – 1 cm; Outer blubber layer – 3.5 cm; Cutaneous trunci layer – 2 cm; Small intestine – 8.4 m; Large intestine – 20.55 m; Intestine – 28.95 m; Lungs 42 cm L – 11 cm W; kidney – 20cm L – 7 cm W; Liver – 40 cm L – 34 cm W; Uterus – 56 cm L – 35 cm W.

**Fig 3: Internal organs of Dugong**



**DESCRIPTION**

Dugongs are born with a brown colour on dorsal and laterally, light reddish brown colour on ventrally. The body of this large but streamlined animal is divisible into head trunk and tail. The skin is thick and divided seven layers that epidermis, dermis, outer blubber, cutaneous truci layer, Inner blubber, Rectus abdominis muscle and parietal peritoneum. The head is relatively small and the upper lip has a broad, horse-shoe shaped extension, which overlaps the sides of the mouth. This muzzle carries a large number of bristles, hair and pores. The eyes are small and have fleshy eye lids. The nostrils are a pair of crescent shaped, the openings located dorsally behind the tip of the muzzle. The ear openings are small and located dorsal laterally on the head. The pair of flippers is located on laterally, between the head and trunk. Two mammary glands, one on each side are

presented just behind the flippers. Genital opening is present in a long slit with fleshy walls, close to the anus. Small umbilicus located on middle of the trunk and just above the genital opening. Maximum girth noted between the genital and umbilicus.

Internal organs are well developed; the lungs are flattened dorsoventrally and extend up to the kidney. The oesophagus is narrow and leads into the stomach. The stomach consists of the cardiac stomach and pyloric stomach. The liver is massive and the pancreas is lobulated and moderately developed. The small intestine is very long and it is about 4 – 5 times the total length of the animal. The large intestine is longer than the small intestine, being about 9 times the length of the animal. The anus is located midventrally at the posterior end of the trunk. The anal opening leads into a shallow sinus into which the outer end of rectum opens. The heart is located in the sternal region, apex of the ventricle has a cleft and two superior vena cava are present. The kidneys are elongated and the medullary portion of the kidney is divided into anterior and posterior halves by a transverse septum. The female ovaries are present in a peritoneal pouch connected to the dorsal abdominal wall by a mesovarium. The uterus is bicornuate and placenta non-deciduous and diffuse. The urinal genital opening of the female is located at a short distance in front of the anus in a long slit with thick fleshy walls

#### DISCUSSION

The Dugong is protected and endangered marine mammals in most places. In the IUCN lists, it was vulnerable to extinction in its Red Data Book of endangered species. Detailed information about the dugongs from India is inadequate. Dugong is less known along the west coast compared with other reef places like Gulf of Mannar, Palk Bay, Andaman and Nicobar islands. Jones, 1959 and Nair et al., 1982 reported immature size dugongs from Gulf of Kachchh. Frazier and Mundkur, (1990) compiled the dugong observation with the help of fisherman interview and reported 18 animals from the Gulf of Kachchh, particularly in Bet Dwarka, Poshitra and their neighbouring areas. Singh, (2003) were noted only four dead dugongs from this region that one skull on Bhaidar island, two dead animals in Bharana and one dead animal at Poshitra coast. Presently we noted recently dead female dugong at Mithapure coast. As per the post-mortem report the internal and external organs are not damaged, maybe it was capture accidentally on fishing net then released to this coast. Fishing activity makes threats to Dugongs distribution and trawlers operation directly affects the seagrass beds. Naturally the destruction caused to the sea grass beds will affect the population of dugongs. A more extensive survey in deeper waters of Gulf of Kachchh may reveal dugong distribution along this coast. There is a need for an international approach to the problem of conservation and management of the dugong population in this region.

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#### REFERENCES

- Annandale, N. 1907. *The appendicular skeleton of the dugong*. *Rec. Indian Mus.*, 1 : 79.
- Annandale, N. 1903. *Notes on the species, external characters and habits of the dugong*. *J. Proc. Asiat. Soc. Bengal (N. S.)*, 1 : 238-243.
- Bertram, G.C.L, Bertram, C.K.R. 1973. *The modern sirenia: their distribution and status*. *Biol. J. Linn. Soc.*, B (4):297-338.
- Frazier JG, Mundkur, T. 1990. *Dugong Dugong dugon Muller in the Gulf of Kachchh, Gujarat*. *Journal of the Bombay Natural History Society*, 87(3) , 368-379.
- Gohar, H.A.F. 1957. *The Red Sea dugong*. *Publ. Mar. Biol. Stn Al. Ghardaqa*. 9 : 3-50.
- Heinsohn, G.E. 1981. 'Methods of taking measurements, other data and specimen material from dugong carcasses', pp. 228-238 in *The Dugong: Proceedings of a seminar/workshop held at James Cook University 8-13 May 1979*. H. Marsh (ed.) James Cook University, Townsville, Queensland, Australia.
- Jones, S. 1959. *On a pair of captive dugongs (Dugong dugon)*. *Lournal of Mar. Biol. Ass. India* 1 : 198-202.
- Jones, S. 1966. *Problems of research and conservation of the dugong, Dugong dugon (Muller) in the Indo-Pacific*. *Proc. Pacif. Sci. Congr.*, 11 :16.
- Jones, S. 1967a. *On a pair of captive dugongs, Dugong dugon (Erleben)*. *Loris*. (2) : 83-86.
- Jones, S. 1967b. *The dugong, Dugong dugon (Muller) its present status in the seas around India with observations on its behaviour in captivity*. *Internat. Zoo IM*, 7:215-220.
- Kumaran P.L. 2002. *Marine mammal research in India – a review and critique of the methods*. *Curr. Scien*. 83 (10) : 1201 – 1220.
- Mani, S.B, 1960: *Occurrence of the sea cow, Halicore dugong (Erxl.), off the Saurashtra Coast*. *J. Bombay Nat. Hist. Soc.* 57 (1): 216- 217
- Mohan, R. S. Lal. 1963. *On the occurrence of Dugong dugon (MU liter) off the Oulf of Kachchh*. *J. mar. hiol. Ass. India.*, 6 ( 1 ) : 152.
- Moses, S. T. 1942 *The fisheries of the Gujarat coast*. *Jour. Gujarat Res. Soc.* 4(2): 61-82. –Dugong, 75.
- Nair R.R., Hashmi N.H and Rao, V.P. 1982. *On the possibilities of high velocity tidal streams as dynamic barrier from longshore sediment transport – evidence from the continental shelf off the Gulf of Kachchh, India*. *Geol.*,47 : 77-86.
- Owen. R. 1838. *On the anatomy of the dugong*. *Proc Zool. Soc. Lond*, 2S-45.

- Phipson, H. M. 1895; *The occurrence of the dugong in the Indian seas. Jour. Bombay Nat. Hist. Soc.* 9(4): 489-490. June 20, 1895.
- Pocock, R.T. 1940. *Some notes on the dugong. Ann. Mag. nat. Hist.* : 329-H5.
- Prater, S. H. 1928. *The dugong or sea-cow (Halicornu dugong). J. Bombay Nat. Hist. Soc.* 33 : (1): 84-99.
- Satish Bhaskar , 1994; *The Dugong: Siren of the seas. Sanctuary Asia* 14: 42-45.
- Silas, E. G. 1961. *Occurrence of the sea cow Halicornu dugong (Er,tl.) off Saurashtra coast. J. Bombay nat. Hist. Soc.* 68; 263-266.
- Sing H.S. 2003. *Sea mammals in marine protected area in the Gulf of Kachchh. Indian Journal of Marine Science* 32 (3); 258-262.